INTRODUCTION AND BACKGROUND

This report responds to the Federal Communications Commission's (FCC) February 20, 2024 charge letter (Charge Letter) directing the North American Numbering Council's (NANC) Numbering Administration Oversight Working Group (NAOWG) to report on number use and resale and number reclamation.

In its *Second Report and Order and Second Further Notice of Proposed Rulemaking* (*Second Report and Order*) issued in September 2023,[1] the FCC sought to strengthen the Commission's rules regarding direct access to numbers by Interconnected Voice over Internet Protocol (Interconnected VoIP) providers to assist in deterring illegal robocalls, protecting national security and law enforcement, safeguarding finite numbering resources, reducing the opportunity for regulatory arbitrage, and promoting public safety. To assist the FCC in furthering these objectives, the FCC directed the NAOWG to provide information on ten topics related to number use, access, and reclamation, particularly by Interconnected VoIP providers. Detailed discussion regarding each of these topics follows.

To begin its analysis, the NAOWG notes that 47 CFR § 9.3 and 47 U.S.C. § 153(25) define "Interconnected VoIP service" as a service that:

a. Enables real-time, two-way voice communications;
b. Requires a broadband connection from the user's location;
c. Requires internet protocol-compatible customer premises equipment (CPE); and
d. Permits users generally to receive calls that originate on the public switched telephone network and to terminate calls to the public switched telephone network.[2]

There are further subsets of Interconnected VoIP providers: facilities-based and non-facilities-based; and fixed and nomadic. 47 CFR 4.3(h) states that Interconnected VoIP providers may be "facilities-based" having their own facilities or "non-facilities-based," using the facilities of other providers.[3] In a 2010 *Declaratory Ruling*, the FCC distinguished nomadic VoIP from fixed VoIP, stating that:

> A fixed Interconnected VoIP service can be used at only one location, whereas a nomadic interconnected service may be used at multiple locations.[4]

The NAOWG recognizes that the Charge Letter seeks information regarding Interconnected VoIP providers' access to telephone numbers. However, many of the observations presented in this report could also apply to other types of service providers using telephone numbers, not just Interconnected VoIP providers.

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1 *Numbering Policies for Modern Communications et al*., WC Docket No. 13-97 et al., Second Report and Order and Second Further Notice of Proposed Rulemaking, FCC 23-75 (rel. September 22, 2023) (*Second Report and Order).*

2 47 U.S.C. § 153(25); 47 CFR § 9.3 47 U.S.C. § 153(25)

3 47 CFR § 4.3(h).

4 *Universal Service Contribution Methodology*, WC Docket No. 06-122, Declaratory Ruling, FCC 10-185, ¶ 3 (November 5, 2010).

A. Interconnected VoIP Provider Use of Telephone Numbers

The Charge Letter first seeks information on:

> How Interconnected VoIP providers that obtain direct access to numbers are using those numbering resources today, including, for example, the extent to which they use numbers obtained in a state to serve customers located in that state, the extent to which they use numbers obtained via direct access to provide non-Interconnected VoIP service, and the extent to which numbers obtained via direct access are resold to other providers.

Obtaining Telephone Numbers for Use in a State

Regarding the ways in which service providers, including Interconnected VoIP providers, use telephone numbers in a state to serve customers in that state, the NAOWG points out that several state and federal regulations apply. For example, the Telemarketing Sales Rule (TSR) requires covered callers to display an accurate Caller ID (calling number) which, among other things, "must permit any individual to make a do-not-call request during regular business hours."[5]

Prior to the wider implementation of Primary Rate Interface (PRI) Integrated Services Digital Network /(ISDN) and VoIP technologies, businesses would have the choice of using either a toll-free number or a standard 10-digit telephone number. The challenge with using the number is that it may not be local to the seller or calling party. Additional complexity was added with the rise of third-party telemarketing companies, often referred to as Business Process Outsourcing (BPO) companies. BPOs presented an opportunity for enterprises to maximize cost efficiency and quality by allowing geographically diverse labor pools managed by businesses that specialize in the complexities of call centers, including labor laws, recruiting tactics, and state/federal calling regulations. BPOs allow a business to focus on developing the products in which they specialize while BPOs manage consumer engagement. It has long been common for BPOs to operate in states other than those where the Seller they service is located, and in the past twenty years, it has become increasingly common for these BPOs to operate from locations outside of the United States.

Large enterprise callers increasingly adopted PRI technologies as Caller ID laws were strengthened under the Telemarketing Sales Rule (TSR). Older Channel- Associated Signaling (CAS) T1 technologies did not allow callers to easily manipulate Caller ID on a per-dial basis, forcing callers transmitting a calling number to utilize a uniform number for all calls within a trunk or trunk group . With PRI, callers could easily manipulate the Caller ID, making it simpler to share costly trunk groups across multiple "Campaigns" while transmitting seller or Campaign- specific calling numbers on each call.

While a PRI would allow the transmission of any phone number for a call's calling number, PRI was limited in its ability to have calling numbers assigned to its trunk group for receiving inbound calls. While toll- free numbers could be assigned to virtually any end user customer, local

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5 https://transition.fcc.gov/cgb/policy/Telemarketing-Rules.pdf

geographic 10-digit numbers are defined by the Local Access and Transport Area (LATA) where the calls were delivered. This was not ideal, as it often misrepresented the location of the Seller or business contacting a consumer. As an example, a large financial institution (i.e., Bank) performed a large portion of their marketing services through, among other places, a collection of call centers in the Midwest. Those call centers, should they be required to use local numbers for their calling numbers, would be restricted to telephone numbers within their specific Midwest area code if they were to be required to handle return calls.

The introduction of VoIP technologies resolved this issue. With this technology, callers could continue to populate calling numbers on a call-by-call basis, but the numbers they could obtain for inbound calling had no geographical restriction. Therefore, businesses were able to better represent the location from which they were calling, which led to higher answer rates.

With this flexibility, businesses began to analyze the effectiveness of using Caller IDs that were based in the same geographical location as the called party, and it was observed that this, too, increased call completion. In 2013, the US Department of Agriculture released a study which found that 49% of participants were influenced by their Caller ID regarding whether or not to answer their phone, and these participants stated a much higher willingness to answer their phone when the Caller ID displayed an in-state Caller ID.[6] Similar studies showed improved answer rates in specific industries, such as debt collection. Before long, technologies were developed to help businesses more easily obtain and manage phone numbers local to the consumers whom they were attempting to contact. While these technologies have improved the capability to reach customers, a 2020 Pew Research Center study revealed that 80% of Americans have generally stopped answering phone calls from unknown numbers.[7] The rationale for not answering may be rooted in the potential of receiving an unwanted or illegal call. In fact, a 2024 YouMail study revealed that there were more than 4.4 billion robocalls placed to American consumers in April 2024.[8]

Today, businesses still see significantly higher call completion rates when using phone numbers that share a common geographical assignment as the party they are calling. Due largely in part to the common adoption of VoIP technology, businesses can more conveniently and economically obtain and use telephone numbers for virtually any part of the country, allowing them to interact with consumers in a manner that creates more of a "local touch" to their interaction. eCommerce organizations with no brick-and-mortar locations can operate nationally with phone numbers local to any market in which they wish to do business, allowing a seamless approach to providing local-appearing customer service lines to their customers. These organizations often direct calls destined for local numbers to a centralized location for call handling which may or may not be located within the United States,

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[6] https://www.nass.usda.gov/Education_and_Outreach/Reports,_Presentations_and_Conferences/reports/Area%20Code%20Report1-27-14.pdf

[7] https://www.pewresearch.org/short-reads/2020/12/14/most-americans-dont-answer-cellphone-calls-from-unknown-numbers/

[8] https://www.prnewswire.com/news-releases/us-consumers-received-just-over-4-4-billion-robocalls-in-april-according-to-youmail-robocall-index-302140727.html

There are also common business applications for localized phone numbers. Conferencing platforms such as Zoom and Webex often allow participants to dial a local number, and a list of phone numbers is presented to meeting participants that allows them to choose the number "closest" to them for usage.

Obtaining Telephone Numbers for Resale

Regarding resale of numbering resources to others, wholesale local services have become more common since the robust introduction of local competition as the result of the Telecommunications Act of 1996. With the introduction of VoIP providers' direct access to telephone numbers, the wholesale market has expanded to include wholesale of local service via VoIP providers.

Non-facilities-based wholesale services provide service to providers that do not maintain network connectivity to their customers. This wholesale arrangement relies upon the network of the wholesaler to provide the numbering resources and connectivity to the end user. Resale and the subscription to unbundled loops and switching (e.g., Unbundled Network Elements-Platform (UNE-P)) are examples of wholesale services provided to non-facilities-based providers. Calls that originate and terminate to the end users will rely upon the network of the wholesale provider. Non-facilities-based wholesale arrangements may apply to both local and long-distance services where the provider of the end users mainly functions to bill the end users. Incumbent Local Exchange Carriers (ILEC), Competitive Local Exchange Carriers (CLEC), and Interconnected VoIP providers may offer wholesale service to non-facilities-based providers.

Facilities-based wholesale services providers offer services to service providers that maintain a network for connectivity to their customers. This arrangement relies upon the wholesaler to provide the numbering resources and the network for traffic terminating to the service provider's customer. However, the wholesale provider's network may or may not be used for originating traffic from the end user as the service provider may route their customers originating calls to a service provider network other than the wholesale provider network. ILECs, CLECs, and Interconnected VoIP providers may offer wholesale service to facilities-based providers.

Some facilities-based wholesale services use number portability to provide the switching capabilities for ILECs such as Rural Local Exchange Carriers (RLEC) that maintain connectivity to their customers but are attempting to decommission Time Division Multiplexing (TDM) switching functionality. This arrangement relies upon the wholesaler's port of RLEC assigned telephone numbers to its switch and establishing IP-based connectivity with the RLEC while the NPA NXX code remains assigned to the RLEC. The RLEC remains the provider of service to the end users and bills the end users for the telephone service. Future number assignment control remains with the RLEC. This is a relatively new arrangement in the market and the impact to compliance or best practice obligations (e.g., default routing and providing vacant code recording) is unclear and may require further analysis.

Facilities and non-facilities wholesale service may be provided to providers that may in turn wholesale the service to yet another provider. It is not clear as to the extent wholesale services are further provided to providers in a wholesale arrangement.

Interconnected VoIP providers often engage in wholesale service acquired through arrangements with third parties, a.k.a. numbering partners. This practice mirrors the pre-existing market dynamics prior to Interconnected VoIP providers obtaining direct access to numbering resources. Historically, and presently, Local Exchange Carriers (LEC) have similar wholesale services where telephone numbers are sourced from the North American Numbering Plan Administrator (NANPA) to other LECs and VoIP providers.

B. Interconnected VoIP Provider Compliance with FCC Robocall and Access Stimulation Rules

The Charge Letter's second request for information reads:

> How use of numbers by interconnected VoIP providers (including use by direct and indirect customers of such providers) complies with the Commission's robocalling and access stimulation rules.

Interconnected VoIP providers generally provide service similar to other voice providers, in that they may offer both retail and wholesale services. However, interconnected VoIP providers also may obtain numbering resources one of three ways. First is through a Numbering Partner such as a CLEC where the CLEC may assign or allocate CLEC numbers for the Interconnected VoIP provider to then assign to its end user customers. Second, the Interconnected VoIP provider may obtain numbers directly from the NANPA. In both arrangements connectivity for the purpose of exchange traffic with the Public Switched Telephone Network (PSTN) is required with a LEC such as a CLEC. Either of these arrangements may also facilitate a third way where an Interconnected VoIP provider obtains wholesale service from one of these Interconnected VoIP providers. This connectivity alternative provides the interconnection necessary to meet the definition of Interconnected VoIP provider.

Where there is an indirect relationship with an end user customer, such as where an Interconnected VoIP is a wholesale provider to the provider that serves the end user customer, the use of the numbers generally requires network functionality of the provider that was originally allocated the numbering resources. This functionality is required to terminate calls destined for those end user customers.

Call origination is not dependent upon the network functionality of the provider that originally obtained the numbering resource. A call originating from a specific 10-digit number may have the option of following a multitude of paths depending upon the network connections that the originating end user customer or the provider has with other providers that facilitate the termination of the calls.

It is this originating capability that necessitates robocall mitigation tools such as Do Not Originate (DNO), Call Analytics, Call Authentication, and the Industry Traceback Group (ITG). The ITG was developed to trace back calls to the point of origination. Due to the dynamic routing of originating calls, tracebacks may result in multiple calls that follow different network paths back to the same originator. As the origination of a call is not dependent upon the number, compliance with the Commission's robocall rules is also not dependent upon the numbers used. Further, if all providers in the call path adhere to existing Commission robocall rules, direct or indirect use of telephone numbers should not impact compliance with the Commission rules.

Terminating telecommunications access traffic that is significantly out of balance as compared to originating access traffic has become known as Access Stimulation. This out of balance traffic is specifically defined by the Commission in its rules.[9] The Commission's Access Stimulation rules contemplate Internet Protocol Enabled Service (IPES) providers engaging in Access Stimulation directly as may be accomplished through direct access to telephone numbers and also indirectly through access to numbering through a Numbering Partner. The Access Stimulation rules address this by making clear that its rules apply to both CLEC and IPES Providers and that they are responsible for traffic that goes to telephone numbers directly assigned to a provider's OCN. Thus, the rules appear to contemplate that IPES providers serving as a wholesale provider and providing telephone numbers to underlying customers, like CLECs that provide telephone numbers to underlying customers, are responsible for compliance with associated access stimulation rules. Some providers may address this concern in the agreements they have with their wholesale customers. It is not clear if Access Stimulation is a significant ongoing problem where such wholesale arrangement exists.

C. Area Code Exhaust and other Public Interest Concerns

The Charge Letter's third request seeks information on:

> How use of numbers by interconnected VoIP providers (including direct and indirect customers of such providers) affects area code exhaust and other public interest concerns.

Every new Central Office (CO) Code allocation within an area code contributes to that area code's exhaust, as area code exhaust is determined when the quantity of assignable CO Codes is depleted, not when the individual telephone numbers within the area code are depleted. The use of numbers by any new entrant, including Interconnected VoIP providers with direct access to numbers such as IPES providers, can accelerate area code exhaust because each new IPES provider must establish a Location Routing Number (LRN) for each switch in each LATA in which it intends to provide service. Regardless of the type of service provider, every new entrant must establish an LRN from an assigned thousands-block, and the service provider must be the code holder of the CO Code containing that thousands-block.

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[9] See associated access stimulation provisions in 47 CFR 61.3, 47 CFR 51.914, 47 CFR 61.26, and 47 CFR 69.3

However, an Interconnected VoIP provider with direct access to numbers who transitions from an existing CLEC business model to an IPES business model may be an exception and not accelerate area code exhaust. In this scenario, an IPES provider is still a new entrant but could use the same LRN and CO Code assignments used in their previous CLEC network as migration takes place (e.g., LATA by LATA) resulting in no additional requests for numbering resources under the IPES Operating Company Number (OCN) other than normal growth requests that would have also occurred under the CLEC.

IPES providers may only identify a few states in their initial applications for direct access but are typically granted nationwide authorizations when direct access is granted. There are more than 200 LATAs in the United States, so each new IPES provider presents the possibility that 200 or more CO Codes will need to be assigned for LRN purposes. Fortunately, many IPES providers choose to offer service in targeted areas, and not in every LATA. However, number rotation practices may incentivize some IPES providers to open additional CO Codes for LRNs and pool replenishment simply to obtain more numbers in additional LATAs or area codes.

NANPA tracks the gross and net quantity of CO Codes assigned each year, the quantity of CO Codes assigned for LRN purposes, and the quantity of CO Codes transferred from one service provider to another to avoid opening a new CO Code for LRN purposes.[10] The table below identifies the average annual increases in each of these metrics for two four-year periods over the last eight years, the 2016-2019 timeframe and the 2020-2023 timeframe.[11]

	2016 - 2019	2020 - 2023	Percentage Increase
Average annual net CO Code assignments[12]	2,709	4,106	52%
Average annual CO Code assignments for LRN purposes	509	733	44%
Average annual CO Codes transferred for LRN purposes to avoid assigning a new CO Code	42	126	199%
Total quantity of IPES providers with direct access to numbers[13]	42	124	195%

[10] See generally NANPA's Annual Reports, available at https://www.nationalnanpa.com/reports/reports_annual.html.

[11] The first IPES provider was granted direct access to numbers in March 2016. See https://www.fcc.gov/wireline-competition/competition-policy-division/numbering-resources/general/voip-numbering.

[12] *See generally*, NANPA's Annual Reports, available at https://www.nationalnanpa.com/reports/reports_annual.html.

[13] *See generally*, the FCC's webpage on VoIP Numbering Authorizations, available at https://www.fcc.gov/wireline-competition/competition-policy-division/numbering-resources/general/voip-numbering.

NANPA, some state commissions, and service providers have worked together to transfer existing CO Codes to new entrants for LRN purposes rather than open new CO Codes. These CO Code transfers create additional work for NANPA, the state commissions that choose to be involved, and for the old and new service providers involved. CO Code transfers also require SPID migrations in the Number Portability Administration Center (NPAC), creating additional work for the Local Number Portability Administrator (LNPA) and service providers that manage their own Local Service Management Systems (LSMS). Despite this extra effort, sometimes there is no alternative but to open a new CO Code to establish an LRN.

In summary, the increases in the above table cannot be solely attributed to IPES providers but are provided to illustrate the overall increases across all service provider types. This information can be viewed as a general indication of increased competition from IPES providers and/or number rotation practices to some extent by some service providers.

D. Potential Benefits or Harms Related to Changes on Availability of Direct Access

The Charge Letter's fourth request reads:

> The potential consumer benefits or competitive harms of increasing the availability of direct access to numbers or placing additional limits on the use of numbers obtained via direct access.

Increasing VoIP service providers' direct access to numbers benefits consumers by facilitating the expansion of VoIP as an alternative to traditional wireline service. VoIP service providers require numbers to serve their growing number of customers and to allow for a greater selection of voice providers by consumers. The NANPA tracks allocation of numbers by service provider type month over month, and year over year. As indicated in the tables below, block assignments to IPES providers accounted for nearly 16% of the block assignments for the five-year period 2019-2023. Throughout 2024, block assignment to IPES entities continued to contribute to NANPA overall block assignments, competing with CLECs and Wireless providers.[14] IPES growth is also demonstrated by the increasing number of VoIP entities granted VoIP numbering authorization by the FCC. Between 2022 to 2024, 24 IPES entities were granted VoIP numbering authorization, further demonstrating IPES continued growth.[15] Although the addition of VoIP providers' direct access to numbering has increased the demand for CO Codes, at this time, their overall quantity of numbers obtained by IPES providers is lower than some other industry segments, since VoIP providers began obtaining numbers directly less than 10 years ago.

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[14] As reported by the NANPA to the NAOWG 2024 YTD

[15] https://www.fcc.gov/wireline-competition/competition-policy-division/numbering-resources/general/voip-numbering

CO CODE ASSIGNMENTS							
YEAR	CLEC	ILEC	IPES	RBOC	ULEC	WIRELESS	TOTAL
2019	1528	34	867	15	0	972	3416
2020	1486	3	1982	12	2	1375	4860
2021	1773	10	2576	9	1	2570	6939
2022	1498	2	1947	10	25	1784	5266
2023	1743	4	879	3	25	2213	4867

CO CODE ASSIGNMENTS PERCENTAGE BY YEAR						
YEAR	CLEC	ILEC	IPES	RBOC	ULEC	WIRELESS
2019	44.73%	1.00%	25.38%	0.44%	0.00%	28.45%
2020	30.58%	0.06%	40.78%	0.25%	0.04%	28.29%
2021	25.55%	0.14%	37.12%	0.13%	0.01%	37.04%
2022	28.45%	0.04%	36.97%	0.19%	0.47%	33.88%
2023	35.81%	0.08%	18.06%	0.06%	0.51%	45.47%

CO CODE ASSIGNMENTS PERCENTAGE CHANGE YEAR-OVER-YEAR						
YEAR	CLEC	ILEC	IPES	RBOC	ULEC	WIRELESS
2019	-	-	-	-	-	-
2020	-2.75%	-91.18%	128.60%	-20.00%	-	41.46%
2021	19.31%	233.33%	29.97%	-25.00%	-50.00%	86.91%
2022	-15.51%	-80.00%	-24.42%	11.11%	2400.00%	-30.58%
2023	16.36%	100.00%	-54.85%	-70.00%	0.00%	24.05%

BLOCK ASSIGNMENTS							
YEAR	CLEC	ILEC	IPES	RBOC	ULEC	WIRELESS	TOTAL
2019	30559	212	2620	108	11	18542	52052
2020	33714	56	12690	97	6	27561	74124
2021	37312	72	21204	96	18	44190	102892
2022	19351	10	11040	82	300	32150	62933
2023	24546	88	8285	33	194	30121	63267

BLOCK ASSIGNMENTS PERCENTAGE BY YEAR						
YEAR	CLEC	ILEC	IPES	RBOC	ULEC	WIRELESS
2019	58.71%	0.41%	5.03%	0.21%	0.02%	35.62%
2020	45.48%	0.08%	17.12%	0.13%	0.01%	37.18%
2021	36.26%	0.07%	20.61%	0.09%	0.02%	42.95%
2022	30.75%	0.02%	17.54%	0.13%	0.48%	51.09%
2023	38.80%	0.14%	13.10%	0.05%	0.31%	47.61%

BLOCK ASSIGNMENTS PERCENTAGE CHANGE YEAR-OVER-YEAR						
YEAR	CLEC	ILEC	IPES	RBOC	ULEC	WIRELESS
2019	-	-	-	-	-	-
2020	10.32%	-73.58%	384.35%	-10.19%	-	48.64%
2021	10.67%	28.57%	67.09%	-1.03%	200.00%	60.34%
2022	-48.14%	-86.11%	-47.93%	-14.58%	1566.67%	-27.25%
2023	26.85%	780.00%	-24.95%	-59.76%	-35.33%	-6.31%

A CLEC or VoIP/IPES provider may offer voice services to the same class of service/type of customer, e.g., residential voice, commercial voice. Both the CLEC and the VoIP/IPES provider

have the same numbering needs based on their customer types. Placing new additional limits on the use of numbers obtained via direct access without placing these limits on other types of providers could be considered discriminatory. This may impose burdens on Interconnected VoIP providers and their customers that are not applied to other recipients. Also, given that VoIP providers represent a smaller portion of the market for direct numbering resources than other providers, new rules that are not industry-wide may not have the intended outcome associated with numbering resource exhaust issues.

Numbering use is currently monitored by requiring service providers, including Interconnected VoIP providers with direct access, to comply with reporting mandates such as the Numbering Resource Utilization/Forecast (NRUF) reporting. NRUF reporting is critical for promoting transparency in VoIP numbering utilization, as it requires providers to submit biannual reports detailing their utilization and projected demand for numbering resources obtained directly from NANPA. This reporting enables NANPA and regulators to maintain accurate records of number utilization and anticipate future needs, while assessing trends, thereby ensuring that numbering resources are efficiently allocated and preventing the exhaustion of available numbers.

Interconnected VoIP providers, along with other service provider types, submit utilization and forecasts on the NRUF. The utilization data requires that carriers report on their allocated numbers across six categories: assigned, intermediate, reserved, aging, administrative, and available and is further broken down by geographic area codes. However, numbers which are resold to third parties, may automatically be categorized as "assigned" by providers that do not have clear visibility into their downstream customers. Without direct access, NRUF utilization data is less likely to clearly reflect utilization involving wholesale customers, which becomes increasingly likely with each layer of resale. With direct access, there is an increased benefit of providing transparency into the practices of providers that use numbering resources.

Wholesale service and the associated numbers are notably complex, and may involve multiple intermediaries beyond the retail provider. Each layer of resale introduces additional challenges to visibility regarding where multiple providers are in the use of numbers, as secondary providers may not always be required to provide detailed reporting on numbers associated with the wholesale services purchased from upstream providers.

E. Mitigation of Adverse Impacts of Number Disuse, Misuse, or Resale

The Charge Letter seeks information on:

> Possible options for mitigating any identified adverse impacts on consumers of number disuse, misuse, and resale, and how any Commission-imposed requirements for, or limits on, number use or resale would impact consumers, providers, and competition.

Revisiting Call Authentication Protocols

Consumer engagement and telemarketing laws are complex. In addition to regulations administered by the Commission, laws around calling practices from commercial enterprises can

vary significantly state-by-state. For example, in the state of Louisiana, text messages to cellular numbers for marketing purposes require Prior Express Written Consent (regardless of technology utilized), and there are no exemptions for Established Business Relationships (EBR). Conversely, California and Rhode Island only allow those same communications when there is an EBR. There are no clear allowances for any other sort of consent to be given, including Prior Express Written Consent. While likely not performed through maleficence, calls that violate these regulations infringe upon the consumer protection rights of those called. These calls will likely follow the same patterns as fully legal and compliant calls, often making it difficult for any external party, such as a communications provider, to accurately distinguish between legitimate and illegitimate calls.

Similarly, those truly acting with maleficence or conscious disregard of legal and regulatory requirements will also mimic certain tactics employed by good actors. These callers will commonly obfuscate their employer's identity as they try to connect a called party with a buyer for the call (commonly referred to as "Live Transfers") or to harm the consumer through fraudulent sale, identity theft, or social engineering tactics that will allow them to gain access to technology or credentials held by the victim. Some of the most notable actions that have reduced activities from bad actors have come from enforcement actions taken by the Commission, Federal Trade Commission, or the state attorneys general in shutting down bad actors.[16] Additional detail may be found regarding call authentication including robocalling mitigation in the NANC's CATA WG reports.

There should be continued emphasis on the development and implementation of new and robocall mitigation techniques as new technology evolves. This should include further refinement of analytic providers' technology to diminish an unintended consequence of false positive spam labeling resulting in increased number utilization due to number rotation.

Fairly imposing appropriate limits on number assignment presents significant challenges. As an example, a limitation based on call volume may be impractical. According to Consumer Affairs, "Almost all Americans (97%) own a mobile phone."[17] Regardless of their primary usage, many of these same Americans work for an organization where they have an additional stationary "office" line with a telephone number assigned. These phone numbers are often included within email signatures, on business cards, and even in advertisements. Some of these users may make only a few calls a year from that desk phone, whereas others in that same organization may make hundreds. If a limitation were placed based on usage, an appropriate defined measurement that would allow a business to assign a phone number to each employee could only be arbitrarily defined. Thus, usage limitations are not recommended. It is important to many businesses that all calls are placed using a phone number owned by the same business. This allows for continued

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[16] https://www.fcc.gov/document/fcc-orders-voice-service-providers-block-student-loan-robocalls https://ncdoj.gov/attorney-general-josh-stein-shuts-down-texas-robocallers/; https://www.ftc.gov/news-events/news/press-releases/2023/04/ftc-ramps-fight-close-door-illegal-robocalls-originating-overseas-scammers-imposters Consent Decree, Indiana v. Startel Commc'n L.L.C., No. 3:21-cv-00150 (Apr. 6, 2022) (consent decree agreeing to network monitoring and a prohibition on providing services to new Voice Service Provider (VSP)).

[17] https://www.consumeraffairs.com/cell_phones/cell-phone-statistics.html#:~:text=age%20and%20gender-,Almost%20all%20Americans%20(97%25)%20own%20a%20mobile%20phone.,%25)%20or%20smartphones%20(76%25).

customer communication regardless of sudden planned or unplanned staffing changes. Having dedicated "office" lines is often the simplest and most cost-effective method in reaching this goal.

Similarly, restrictions have been considered related to physical location, but this, too, can be challenging to fairly assess. If limits were placed upon number assignment based on markets to which a subscriber conducts business or has customers, this will likely not provide any significant relief for number requests. As businesses continue to shift to "virtualized" environments while simultaneously expanding their market to a national reach, there is often more overlap than separation in these geographical locations. Additionally, the availability of local phone numbers allows the businesses to be called at no cost to the customer. This can be especially useful if a consumer wishes to call a number displayed on their Caller ID to identify the caller and, if it is a business with whom the consumer does not wish to interact, easily request to opt out of future calls.

Physical location can also be deceptive. In 2018, South Carolina passed the Telephone Privacy Protection Act, which prohibits display of a South Carolina area code in a Caller ID unless the caller has a physical location within that state.[18] However, a growing practice is for local businesses, especially in food service, to outsource their calls. A common example of this can be seen in the pizza delivery industry. Each store being serviced will have a local phone number assigned to them, but all calls are routed to the same BPO –sometimes in another country. The physical location allows the business to obtain a number that is never used by an employee of that business within that state. Similarly, that same call center can send the customer text or call updates using that state- specific Caller ID, even if the call originates outside of the state. If that same consumer also banks with a U.S.- based global financial institution that has locations in only 6 states (none of them South Carolina), it is quite possible that a foreign- based BPO could use a South Carolina number to contact that consumer on behalf of a national pizza chain with a localized Caller ID to let them know about a deal on the purchase of pizzas, but the global financial institution could not do the same to alert a consumer about a potentially fraudulent purchase.

At this time, there is no data to suggest that restrictions on number assignment from specific carrier types will have any effect on this behavior. Good actors operating according to state and federal regulations will continue to obtain calling numbers as necessary to contact their customers according to their standard operating procedures. Conversely, bad actors will continue to obtain numbers as needed but, perhaps more often, continue to operate utilizing numbers that are not assigned or subscribed to by them. While practices such as call authentication and number blocking from a reasonable Do Not Originate (DNO) list, which includes unassigned numbers, have the potential to reduce illegal calls, this will have no effect on number depletion. While limiting number assignment to only those who have either a physical presence or service consumers in a certain geographical area may reduce number usage, there is no clear data to measure the impact on preserving numbering resources.

Conversely, limiting numbering resources to strictly the physical location of the caller has been shown to have negative repercussions on the businesses calling those areas, which could have

[18] Telephone Privacy Protection Act, H 4628 at https://www.scstatehouse.gov/sess122_2017-2018/bills/4628.htm

not only negative economic impacts on the business, but can also prevent consumers from receiving vital calls or text messages that they want to receive. The origin of the call must be considered; businesses commonly operate from data centers or cloud infrastructure and may utilize globally dispersed teams. The "origination" of the call may generate unnecessary debate. Finally, considerations should be given to special circumstances that would intentionally require a phone number that relates to the area of neither the caller nor the called party. This can be observed in certain social services programs as well as with law enforcement and protective services. For example, to protect the location of a Domestic Violence Shelter and its residents, the shelter's originating telephone number may appear to be located in New York when the shelter is actually located in Georgia.

Protecting Consumers and Numbering Resources through Visibility into the Customers of Wholesale Providers

The Commission has limited resources that contain information about the wholesale of numbers that their customers resell. Indeed, in many instances the wholesalers themselves may not have access to information other than the wholesale customers they directly connect. This limited visibility can be problematic. While some businesses may cycle through volumes of numbering resources to bypass unsophisticated analytics engines that aggressively flag them as spam, the use of large volumes of numbers disposably has also been linked to illegal robocall campaigns, which also seek to bypass these analytics engines—as noted in multiple AG enforcement actions.[19] USTelecom has also emphasized the lack of visibility into usage of numbers as contributing to this problem: "[r]obocallers are often able to obtain these numbers by way of an extensive number distribution and resale market that may also shield bad actors from responsibility."[20]

It may be valuable for the Commission, as well as other federal and state regulators and enforcement agencies, to have access to information of number allocation and utilization. This may facilitate enforcement against bad actors who misuse numbering resources to fuel illegal robocall campaigns, as well as facilitate preventative actions too. It could also help to combat premature exhaust of numbering resources. If the Commission seeks accountability for a wholesale customer's misuse of numbers, it should apply the same requirements on the customers of wholesalers to the extent they are similarly situated in administering numbering resources to serve end user customers e.g., number administration, robocall mitigation, and access stimulation rules.

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19 *See, e.g.*, Complaint and Demand for Jury Trial, *State of Arizona ex rel. Mayes, et al. v. Michael D. Lansky, LLC, dba Avid Telecom, et al.*, Case No. 4:23-cv-00233 at 23 ¶ 84, 24-25 ¶ 88(a-d), 78 ¶ 375 (D. Az. May 23, 2023); Complaint for Permanent Injunction, Damages and Other Equitable Relief, *Ohio ex rel. Yost v. Aaron Michael Jones, Sumco Panama USA, et. al*, Case No. 2:22-cv-02700 at 17 ¶ 57, 18 ¶ 61- 62 (S.D. Oh. July 7, 2022); Complaint, *State of Vermont v. Bohnett*, Case No. 5:22-cv-00069 at 28 ¶ 105(c) (D. Vt. Mar. 18, 2022); Complaint for Injunctive Relief and Civil Penalties, *North Carolina ex rel. Stein v. Articul8, LLC & Paul K. Talbot*, Case No. 1:22-cv-00058 at 16 ¶ 60, 18 ¶ 65 (M.D.N.C. Jan. 25, 2022).

20 *Second Report and* Order, n. 231 (citing to USTelecom Comments, WC Docket No. 13-97 et al., at 5-6 (rec. Oct. 14, 2021)); USTelecom Comments, CG Docket No. 17-59 et al., at 14 (rec. Aug. 17, 2022)).

The Commission reserved for future determination whether to adopt a specific know-your-customer certification in the direct access application context.[21] The Commission also proposed requiring direct access authorization holders obtaining from the indirect access recipient "all the same certifications, acknowledgments, and disclosures the indirect access recipient would have had to provide under section 52.15(g)(3)…and file with the Commission a list of the voice providers to which the direct access authorization holder sells, leases, or otherwise provides telephone numbering resources that it obtained directly, and update that list within 30 days of adding any new indirect access recipient."[22] The NRUF geographic job aid already expects service providers to enter carrier/entity information in the Notes/Assignee field.[23] This information provides general identification of wholesale customers that obtain numbering resources available for assignment to their customers. NRUF reporting does not provide the association numbers with non-facilities based resale arrangement. The purpose of the NRUF is to forecast number utilization and exhaust. If the Commission were to adapt the NRUF to expand the purpose to provide more detailed information such as non-reporting wholesale customers, at a minimum, it would need to change the definition of the NRUF to include such information. It is not recommended that the NRUF be modified to identify the use of numbers by non-facility based providers as these numbers generally are reflected as assigned numbers within the service provider's number inventory.[24]

The use of numbers is sometimes tied to other requirements in state laws. Relevantly, the Commission has required that direct access authorization "is subject to compliance with applicable Commission numbering rules; numbering authority delegated to the states; and the state laws, regulations, and registration requirements applicable to businesses operating in each state where the applicant seeks numbering resources; and industry guidelines and practices regarding numbering as applicable to telecommunications carriers."[25] However, numbering requirements consistently applied upon all providers that rely upon numbering resources to compete at a state level or nation-wide creates a non-discriminatory regulatory landscape that allows competition equally among providers. Thus, any new requirements are best applied at the federal level to avoid a patchwork of regulatory requirements and minimize cost burden on state level enforcement. The Commission should work collaboratively with state regulatory agencies to provide full visibility into any new required data and to effectuate enforcement actions. It is further recommended that existing rules and regulations continue to be enforced by federal and state agencies and potential consideration of a broader application of such rules and regulations to include providers who are not currently obligated to report e.g., some resellers.

Compliance with the documentation requirements of the NRUF and any additional detail should be a precondition for continued access to numbering resources, but the Commission should clarify who is responsible for enforcing such a requirement. NANPA has the authority to withhold numbering resources from any U.S. carrier that fails to comply with the reporting and numbering

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21 *Second Report and Order*, ¶ 58.

22 *Second Report and Order*, 87

23 https://www.nanpa.com/sites/default/files/2024-10/NRUFGeographicJobAid_0.pdf section 6

24 This conclusion does not reflect the view of all NAOWG members.

25 47 CFR 52.15(g)(3)(ii)(B); *Second Report and Order*, ¶ 50, Appendix A.

resource application requirements established in 47 CFR 52.15.[26] The regulations also note that carriers that fail to comply with a state commission request for numbering resource application materials "shall be denied" numbering resources.[27] This burden has often fallen upon state commissions to investigate numbering resource application materials and submit deficiencies to NANPA to prohibit the non-compliant entity from obtaining new numbering resources. It is otherwise unclear who is tasked with enforcing compliance for inaccurate or incomplete applications, or with reclaiming numbers granted to a non-compliant entity.

The Commission should also make use of its auditing authority to investigate misuse of numbering resources. The NANC noted in its January 2023 ITN report that this authority has not been exercised for years[28] (more than 15 years at that time). All telecommunications service providers shall be subject to "for cause" and random audits to verify carrier compliance with Commission regulations and applicable industry guidelines relating to numbering administration.[29] A compliance audit can help to determine when entities are not filling out reports like the NRUF correctly and would need to go beyond NANPA's Utilization Missing Reports, which only determine whether any report has been filed, not whether the report has been filed accurately and completely.[30]

Different companies may structure resale of numbering resources differently. For example, one provider may not provide numbers to providers for future assignment[31] where others only provide

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26 47 CFR 52.15(g)(5).

27 47 CFR 52.15(g)(6). The Thousands Blocks and Central Office Code Assignment Guidelines (TBCOCAG) in section 5.1.8 also notes that: "SPs that fail to comply with a state commission request for copies of Numbering Resource application materials shall be denied Numbering Resources when the state commission demonstrates (e.g., by email or facsimile) to the PA that the SP failed to comply with the request." (internal citations omitted).

28 North American Numbering Council, Report and Recommendation on the Feasibility of Individual Telephone Number (ITN) Pooling Trials and Alternative Means for Conserving Numbering Resources, 31 (Jan. 31, 2023), https://www.fcc.gov/files/finalnaowgnancitnapprovedreport02282023 ("[t]he FCC established a comprehensive audit program and codified its audit process. Estimated audit expenses are included in the NANPA budget, but no monies have been drawn against the audit budget line item in recent years."). Indeed, the most recent time these funds were actually used appears to have been 2006. See Welch & Co., LLP, Billing and Collection Agent Report For period ending May 31, 2006, to NANC, at 1 (June 5, 2006), https://x20b6c.p3cdn1.secureserver.net/wp-content/uploads/2014/08/NANC-May-2006.pdf (noting $171,063 spent on carrier audits). This is the most recent report in which carrier audit funds were actually used; future reports indicate a variance equal to the total amount budgeted, *see, e.g.*, NANP Fund, Statement of Changes in Fund Balance Oct. 2022 to Sept. 2023, at 3 line 9 (Oct. 2023), https://x20b6c.p3cdn1.secureserver.net/wp-content/uploads/2023/10/September-2023.pdf (noting $200,000 variance between actual results and budget as of Sept. 30, 2023).

29 47 CFR 52.15(k)(1)

30 The NANPA, the Pooling Administrator, or a state commission, if it has reason to believe that a service provider may have violated the Commission's rules or orders or applicable industry guidelines, may request a "for cause" audit of the service provider by written request to the Bureau. (DA 09-2375)

31 NANPA, Numbering Resource Utilization/Forecast (NRUF) Form 502 Job Aid (Reporting Geographic Utilization and Forecast Data at 2.2.2 (Ver. 1.0 October 28, 2024), https://www.nanpa.com/sites/default/files/2024-10/NRUFGeographicJobAid_0.pdf (" 'Resold' services should also be treated like ported numbers, meaning the carrier transferring the service to another carrier or non-carrier entity should classify the numbers as 'Assigned' and the numbers should not be counted by the receiving carrier. These numbers should not be considered intermediate numbers because the intermediate classification only applies to blocks of numbers obtained from or given to another

numbers as they are assigned by the wholesale customer to their end user customers. Providers with direct access to numbering resources may make their numbering resources available to their wholesale customers or resellers via a mechanized interface. At present, there are perceived differences in reporting obligations that depend upon the extent to which services are provided. Because of the impact of these perceived differences, it is important that regulators have the ability to validate compliance.

F. Impacts on Consumers and Number Exhaust when Interconnected VoIP Providers Obtain Telephone Numbers in a State where They Serve Few Customers

The Charge Letter seeks comments on:

> Ways to minimize the adverse impacts on consumers and/or area code exhaustion arising from Interconnected VoIP providers obtaining numbers in a state where they serve few or no customers, including the efficacy of Commission adoption of a "minimum contacts" requirement to obtain numbering resources in a particular state, and possible options for defining such a standard.

All new entrants regardless of technology may have the potential to contribute to inefficient number resource allocation and overall number utilization, particularly when new CO Codes need to be opened to meet LRN needs. This expanded utilization in turn may contribute to number exhaust, particularly in some geographic regions. The ability for Interconnected VoIP providers to obtain numbering resources in instances in which they are not limited to end users within specific states has the further potential to accelerate number exhaust in those states. In some cases, this may be exacerbated by the lesser state regulatory obligations Interconnected VoIP providers face versus traditional service providers, and especially when there may be a lack of enforcement of current state and federal regulatory compliance requirements.

While there are valid business reasons for some Interconnected VoIP service providers to request telephone number resources in a state in which they or their end users have no physical presence, all Interconnected VoIP providers need to demonstrate that they are following applicable federal and state rules and requirements, and be held accountable for their applicable obligations, just as all other service providers obtaining numbering resources are held to their applicable standards currently.

The FCC declined to define "minimum contacts" or impose a standard for "minimum contacts" in the *Second Report and Order,* due to the lack of consensus on a definition.[32] However, the FCC indicated that Interconnected VoIP providers are "subject to compliance with applicable laws, regulations, and registration requirements for businesses operating in the state(s) where the

carrier or non-carrier entity for future assignment. Numbers transferred with resold services already have established customer assignments and therefore cannot be used for future assignment.").

[32] *Second Report and Order*, ¶ 51.

authorization holder seeks to obtain numbers."[33] Many states already have various registration requirements based on business activity, such as registering with their Secretary of State's Office, or other state and local administrative agencies. Some states also have public utility registration and reporting requirements for Interconnected VoIP service providers. In addition to any state requirements, communications providers including Interconnected VoIP providers need to meet certain federal obligations, including but not limited to: registration for and filing of FCC Form 499; compliance with FCC Form 502 (Numbering Resource Utilization/Forecast (NRUF)); FCC Form 477 (Fixed Broadband Deployment Data); and, specific to Interconnected VoIP providers a 30-Day State Notification,[34] for each state in which they are offering services.

Thus, while the NAOWG cannot speculate as to any potential, "… adverse impacts on consumers and/or area code exhaustion…", nor do we agree any such event may be limited to or caused by, "… interconnected VoIP providers obtaining numbers in a state where they serve few or no customers," the NAOWG does agrees that it is critical to ensure efficient number resource allocation and appropriate overall number utilization nationwide.

Recommendations

- A more formal enforcement process of existing requirements may need to be developed by the FCC and states to address entities that are non-compliant.

- There should be more focus on numbering resource allocation to all service providers and not just Interconnected VoIP. For example, there are various means for conserving numbering resources, including the following key conservation measures:

    - Voluntary Transfers of Over-Contaminated Thousands-Blocks Between SPs
    - Industry Review of Forecasting, Geographic Number Assignment Practices, and Brokering, of Numbering Resources
    - Mandatory Thousands-Block Pooling in all Rate Centers
    - Mandatory 10-Digit Dialing in All NPAs
    - Expansion or Release of D-Digit to Make Additional CO Codes Available for Assignment
    - Rate Center Consolidation
    - Boundary Elimination Overlay Methodology
    - Increasing Contamination Levels for Thousands-Blocks
    - Hundreds-Block Pooling
    - Service Provider Education and Enforcement
    - Evaluation of continued necessity of Feature Group B service to determine if 950 can be used as an NPA

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33 *Second Report and Order*, ¶ 50.

34 *See, See Numbering Policies for Modern Communications et al.*, WC Docket No. 13-97 et al., Report and Order, rel. June 22, 2015.

Evaluation of the continued use of 976 as a Tariffed service to determine if it continues to serve the public interest.[35]

- The FCC should continue with vigor during its review and approval of new applicants for Interconnected VoIP direct access to numbers and that such numbers are actually being used for Interconnected VoIP services. And/or consider a re-review post approval for adherence and compliance/did they do what they said in their application, etc.

G. Impact of Reclaiming Numbers from Service Providers that have their Direct Access Authorizations Revoked

The Charge Letter seeks comments on:

> The potential impact on consumers, end-users, and providers of reclaiming numbers already assigned to holders of direct access authorizations that have their authorizations revoked.

The impact of reclamation of numbering resources may be different based upon the goal behind the revocation and the extent to which direct access to numbers is revoked. The following describes three levels of number reclamation:

- Reclamation of only unassigned numbers that were obtained through direct access;
- Reclamation of assigned and unassigned numbers that were obtained through direct access; or
- Reclamation of all assigned and unassigned numbers obtained through direct access and also numbers obtained through a wholesale/resale arrangement and numbers that have been ported in.

If there is reclamation of only unassigned numbers, all assigned numbers would need to be ported or otherwise transferred to another eligible service provider. The transfer of numbers to an alternate service provider accomplishes the level of revocation of unassigned numbers and allows the Interconnected VoIP provider to establish a Numbering Partner arrangement to maintain service to their existing customer base. This scenario has the potential to minimize service disruption that would affect the end user customers as they may be able to stay with their existing service provider; however, their service plans and rates could be impacted because, as an example, establishing numbering partner arrangements could impact the affected service provider's business model. In addition to impacts to the service provider having numbers reclaimed, this would greatly impact other service providers, as one or more of them would have to assume responsibility for the CO Codes and Thousands-blocks assigned to the service provider whose direct access authorization has been revoked. These service providers may not have the need for numbering resources in those rate centers. The level of effort required to transfer these resources is directly proportional to the number of resources that must be transferred. This level of revocation would

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35 *See*, ITN Report.

allow the provider with direct access to continue to serve new and existing customers by establishing alternate arrangements to provide service.

If there is reclamation of assigned and unassigned numbers, there will likely be a negative impact on end user customers. End user customers would either be compelled to find a new service provider or be forced to a designated service provider, similar to the abandoned code process used when a service provider dissolves their business and discontinues services for existing end user customers . Both the abandoned code process and the process of switching service providers are burdensome and may have adverse impacts on end user customers' service plans and rates. In most instances, the numbers would need to be ported to support continuity of service, and the porting process can also be arduous. Otherwise, the customer would be required to obtain a different number and associated service from a different service provider.

If the existing provider is forced to move to a numbering partner arrangement, the end user customer and the existing providers rates could be impacted, adding risk to profitability for the provider and increasing end user consumer rates. Similar to the previous scenario, this would also greatly impact other carriers, as one or more of them may have to assume responsibility for the CO Codes and Thousands-blocks. This level of revocation would allow the provider with direct access to continue to serve existing customers and establish alternate arrangements to provide service though other service providers as described above and continue to serve existing and new customers.

If there is a reclamation of a service provider's entire inventory, end user customers would be forced to switch providers. Otherwise, the abandoned code process would need to be implemented for all numbers obtained through direct access, all numbers obtained through resale, all unassigned numbers, and all ported numbers. Again, other carriers would need to assume responsibility for the CO Codes and Thousands-blocks. This level of reclamation assumes the transfer of numbers and customers to an alternate service provider.

Generally speaking, the process by which reclaimed numbers would be re-allocated to other service providers would be similar to existing porting and resource transfer (e.g., the abandoned code process) processes that occur today, assuming the CO Codes and Thousands-blocks were placed into service; otherwise, they would be returned to NANPA. Additionally, the cost recovery for the transfer and ongoing management of the numbers by the service providers that take them over would need to be addressed. This may include system development and implementation for the provisioning, billing, and maintenance, requiring significant funding and time.

H. Mitigation of Adverse Impacts of Number Reclamation from Service Providers that have their Direct Access Authorizations Revoked

The Charge Letter seeks information on:

> How providers or the Commission could mitigate any identifiable negative impacts of number reclamation resulting from the revocation of direct access authorizations for consumers and end users.

In the Thousands-Block (NPA-NXX-X) & CO Code (NPA-NXX) Administration Guidelines (TBCOCAG), there are existing processes outlined in sections 11 (Reclamation and Return of Numbering Resources) and 12 (Abandoned Numbering Resources) that can be used as the basis for a reclamation process resulting from the revocation of direct access authorizations.[36] These standards protect end user consumers from unanticipated disconnections. Should the Commission decide to revoke direct access and reclaim numbers, the relevant sections of the TBCOCAG could be used as a starting point for number reclamation.

I. Interconnected VoIP Provider Use of Numbering Databases

The Charge Letter seeks information on:

> How interconnected VoIP providers use numbering databases in providing service, and how a restriction on accessing such databases accompanying number reclamation would impact consumers, end-users, and providers.

Interconnected VoIP providers use numbering databases in the same way that other providers use numbering databases. The NANP Administration System (NAS) is used for CO Code acquisition purposes, including initial CO codes for which LRNs are required to facilitate number porting and number pooling. The NAS also provides the capability for service providers to obtain Thousands-blocks from the pool of numbering resources. Finally, the NAS provides access to pseudo-Automatic Number Identification (p-ANI) numbers for the purpose of routing E911 calls to a Public Service Answering Point (PSAP). The NPAC is a system that manages the porting process including the receipt and processing of port requests and the broadcast of routing information to LSMS necessary for service providers to route calls to ported numbers and pooled blocks.

Restriction on access to these systems may be required depending upon the level of number reclamation that is implemented. Reclamation of only unassigned numbers that were obtained through direct access would have the impacts to consumers, end users, and providers as described above. However, with this level of revocation, the service provider may maintain existing end user customers and may be required to have limited access to numbering databases. As a result of this level of number revocation, the service provider may require access to the NPAC and NPAC data for purposes of porting.

Reclamation of assigned and unassigned numbers that were obtained through direct access would have the impacts to consumers, end users, and providers as described above. However, with this level of revocation the service provider may maintain existing end user customers associated with numbers not obtained through direct access and may be required to have limited access to numbering databases. As a result of this level of number revocation the service provider may require access to the NPAC and NPAC data for purposes of porting.

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[36] ATIS Standard ATIS-0300119, Thousand Block & Central Office Code Administration Guide (TBCOCAG), Sections 11 and 12.

Reclamation of all assigned and unassigned numbers including resale, wholesale and ported numbers would have the impacts to consumers, end users, and providers as previously described above. As a result of this level of number revocation, a restriction on the access to numbering databases would not impose additional impacts.

As an alternative to reclaiming numbering resources, depending upon the desired result, restriction on the access to numbering databases may be used to restrict the service provider's access to numbering resources and porting in a way that may have minimal impact on consumers, end users, and providers. A similar result may be achieved without the need to port or otherwise transfer numbering resources. Although unassigned numbers within the service provider's inventory may be available for assignment to new customers, the provider would be limited to only their available inventory.

Further, the provider could be restricted from adding the numbers of new customers through the porting process where their access to the NPAC is restricted. This would still allow customers to port numbers away from the provider and would not require other service providers to port or otherwise transfer and subsequently manage additional numbering resources. Thus, restricting access to numbering databases would have minimal impact on existing consumers, end users and service providers. This alternative may be best used where it is anticipated that the service provider with restriction on the access to numbering databases may be provided the opportunity to cure the basis for the application of restriction on the access to numbering databases. The process for restricting access to the NPAC does not exist today and may need to be developed. Additionally, there should be a review to determine if any changes would be required to the NAS and associated processes.

J. Return of Reclaimed Numbers to Interconnected VoIP Providers with Reinstated Direct Access Authorizations

The final Charge Letter directive is:

> How to return reclaimed numbers to providers with reinstated direct access authorizations.

It is not recommended to return numbers to providers with reinstated direct access authorizations. Returning reclaimed numbers to providers with reinstated direct access authorizations would follow the same burdensome process as was used to port or otherwise transfer these resources when they were initially reclaimed. Returning reclaimed numbers may become more complex and potentially more impactful as the customer base will likely have changed through normal subscriber churn. This creates the complexity of identifying the numbers that have been assigned by the new provider that had been forced to assume the responsibility for managing the numbers post number reclamation. Upon transfer of the numbering resources, these newly assigned numbers would then need to be ported back to the provider and may increase the potential for service disruption.

To the extent a provider has their direct access reinstated to obtain numbering resources, it is recommended that previously reclaimed numbers are not returned. Due to the additional burden and risk of customer service impact, it is not recommended to return numbers to providers with reinstated direct access authorizations. It is recommended that vetting of providers is accomplished to avoid such extreme measures such as reclaiming numbers unless the provider is expected to exit the market permanently. Otherwise, the alternative restriction on accessing such databases should be considered prior to numbering resource reclamation.

CONCLUSION

As discussed in this Report, Interconnected VoIP providers that currently obtain direct access to numbering resources use these resources in a variety of ways, including providing numbers that can be used by large businesses to contact their customers through use of local telephone numbers, to provide non-Interconnected VoIP services, and to wholesale these numbering resources to other providers. Since 2015, when IPES providers were allowed direct access to numbers, the numbers of CO Codes and Thousands-blocks obtained by IPES providers have increased steadily, leading to additional demand for numbering resources. In particular, the need for a new entrant such as an IPES provider to obtain an LRN in each LATA in which they seek numbering resources accelerates CO Code exhaust, although the industry has been able to reduce the need for new LRNs in some circumstances.

In evaluating whether changes to the ability of Interconnected VoIP providers to obtain direct access to numbers should be modified, it is important to note that Interconnected VoIP providers offer additional competitive choices to end user consumers. , By providing Interconnected VoIP providers with direct access to numbers instead of requiring Interconnected VoIP providers to obtain telephone numbers on wholesale/resale markets provides more transparency into how Interconnected VoIP obtain and use their numbers, since they are required to report this use in NRUF reports and any other necessary reports. It is also not clear if restricting direct access by Interconnected VoIP providers would significantly reduce use of numbering resources outside of the LRN context, since Interconnected VoIP providers denied direct access but needing numbering resources would obtain them from the wholesale/resale market.

Any effort to revoke direct access to telephone numbers by Interconnected VoIP providers and reclaim telephone numbers without a finding of malfeasance or noncompliance with applicable regulations would create burdens on other telecommunications providers, which would need to assume the administrative burdens of the reclaimed numbers and end users, who could lose their service provider. While there are some industry guidelines that could govern this reclamation, these guidelines would need to be modified and expanded. If Interconnected VoIP providers were able to remain in the market without direct access to telephone numbers, they would need to obtain telephone numbers on the wholesale/resale market from a Numbering Partner, reducing transparency.

While permitting Interconnected VoIP providers direct access to numbers increases number exhaust because there are additional providers in the market, direct access benefits customer choice and transparency regarding which providers are actually using telephone numbers

to serve end users. The alternative ways to mitigate number exhaust listed in the ITN Report would be more effective than limiting Interconnected VoIP providers' direct access to numbers.

To deter number rotation and illegal robocalling, the Commission and state regulators could require wholesalers/resellers providing telephone numbers to obtain additional information about the uses of these numbers by their wholesale/resale customers. Entities obtaining numbering resources on the wholesale/retail market could be required to comply with the existing numbering rules and industry guidelines. Broadening and enforcement of existing numbering rules by the FCC and state regulators could assist in these efforts.

Appendix A: Glossary

Call – A Phone Call or Text Message.

Caller ID Reputation Score – A risk value or score (typically numerical) assigned by Analytics Providers to determine if a call should be blocked or delivered to a wireless subscriber, and, if delivered, if the call should be presented as a potential spam or scam call.

Established Business Relationship (EBR) – a relationship between a seller and a person based on:

- The person's purchase, rental, or lease of the seller's goods or services or a financial transaction between the person and seller, within the 540 days immediately preceding the date of a telemarketing call; or
- The person's inquiry or application regarding a good or service offered by the seller, within the 90 days immediately preceding the date of a telemarketing call.[37]

Interconnected Voice over Internet Protocol Service – a service that:

- Enables real-time, two-way voice communications;
- Requires a broadband connection from the user's location;
- Requires internet protocol-compatible customer premises equipment (CPE); and
- Permits users generally to receive calls that originate on the public switched telephone network and to terminate calls to the public switched telephone network[38]

Internet Protocol Enabled Service (IPES) Provider – a provider offering a service that:

- Enables communications;
- Requires a broadband connection from the user's location or end to end;
- Requires internet Protocol-compatible customer premises equipment (CPE); and
- Permits users to receive calls that originate on the public switched telephone network or that originate from an Internet Protocol service.[39]

Neighbor Spoofing – Calls in which the calling number is set, often dynamically, to utilize a Caller ID that is in the same general geographical area as the called party, as determined by either the called party's phone number or an assumed physical location.

Numbering Partner - the carrier from which an interconnected VoIP provider obtains numbering resources.[40]

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37 16 CFR § 310.2 (q)

38 47 CFR § 9.3 and 47 U.S.C. § 153(25)

39 47 C.F.R. § 61.3(eee).

40 *See*, *In re Telephone Number Requirements for IP-Enabled Services Providers et al*, WC Docket No. 07-243, Report and Order, Declaratory Ruling, Order on Remand, and Notice of Proposed Rulemaking 07-188, n. 48, rel. November 8, 2007.

Phone Call – A method of communication conducted over PSTN, VoIP, or similar technology designed to facilitate an audible conversation between two parties.

Protection Services – Services to which Callers may subscribe to monitor the status of the Caller ID Reputation Score of a series of phone numbers and/or that provides redress services for spam labels, including preventative measures to prevent spam labeling from occurring.

Robocall – A Call that utilizes prerecorded or artificial voice as the initial or primary means of communication. For the avoidance of doubt, this includes, but is not limited to, technologies such as Artificial Intelligence, Sound Boards, and Text to Speech. Not all robocalls are illegal or unwanted.

Text Message – An electronic message sent using SMS, MMS, or RCS.