

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of	)	
	)	
Nationwide Number Portability	)	WC Docket No. 17-244
	)	
Numbering Policies for Modern Communications	)	WC Docket No. 13-97
	)	
	)	

**COMMENTS OF VERIZON**

William H. Johnson  
Of Counsel

Gregory M. Romano  
Robert G. Morse  
1300 I Street, N.W.  
Suite 500 East  
Washington, DC 20005  
(202) 515-2400

*Attorneys for Verizon*

December 27, 2017

**TABLE OF CONTENTS**

**I. INTRODUCTION AND SUMMARY..... 1**

**II. ELIMINATING THE N-1 QUERY AND DIALING PARITY RULES WOULD  
ENABLE SERVICE PROVIDERS TO DEVELOP MORE EFFICIENT CALL  
ROUTING LONGER TERM AND HELP START THE TRANSITION TO  
NATIONWIDE NUMBER PORTABILITY..... 3**

**A. The Modified Rules Would Better Reflect the Communications Marketplace  
and the Wide-Area Capabilities of IP-Enabled Networks. .... 4**

**B. Market Forces Should Drive Service Provider Implementation of Any  
Newly-Permissible Standards-Based Call Routing Arrangements. .... 5**

**III. COMMERCIAL AGREEMENTS WILL MEET DEMAND FOR NATIONWIDE  
NUMBER PORTABILITY WHILE THE INDUSTRY TRANSITIONS TO IP-  
ENABLED NETWORKS..... 6**

**A. IP-Enabled Networks Will Most Effectively and Efficiently Support  
Nationwide Number Portability. .... 7**

**B. The National LRN and NGLRN Options Would Require Substantial  
Upgrades to Legacy Networks. .... 9**

**IV. THE COMMISSION SHOULD NOT IMPOSE NEAR TERM POLICY CHANGES  
ON TEN-DIGIT DIALING AND NUMBERING ADMINISTRATION. .... 11**

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of	)	
	)	
Nationwide Number Portability	)	WC Docket No. 17-244
	)	
Numbering Policies for Modern Communications	)	WC Docket No. 13-97
	)	
	)	

**COMMENTS OF VERIZON**

**I. INTRODUCTION AND SUMMARY**

Verizon supports the Commission’s proposals in the *NPRM*<sup>1</sup> to revisit the rules and industry standards that restrict service providers’ dialing and call routing arrangements as a first step towards laying the groundwork for nationwide number portability. The rule changes proposed in the *NPRM* would remove regulatory obstacles that, when coupled with updated industry standards and coordinated service provider implementation, will enable more efficient call routing arrangements in the longer term. Those arrangements ultimately will give consumers more service options and better reflect how they use communications services. The *NOI* also correctly recognizes that complicated numbering issues must be resolved to move toward the laudable longer term goal of nationwide number portability. The *NOI* poses helpful questions and a good overview of the many industry practices and implications for providers’ network architecture that have evolved over the years. The Commission’s local number

---

<sup>1</sup> See *Nationwide Number Portability, Numbering Policies for Modern Communications*, Notice of Proposed Rulemaking and Notice of Inquiry, 32 FCC Rcd 8034 (2017) (“*NPRM/NOI*”).

portability (“LNP”) rules, and the Location Routing Number (“LRN”) porting method implementing them, are premised on the architecture of wireline telecommunications networks as they existed at the time of the 1996 Act: central offices serving designated rate centers connected to ILEC tandems within the LATA; and IXCs, in turn, handling calls between LATAs. The LRN porting method, local seven-digit dialing, and other challenges to implementing nationwide number portability are intertwined with this basic legacy network configuration. And the rules and industry standards governing LNP for wireless service providers derived from the same presumptions about the nature of service providers’ “local” networks, despite the substantial differences between wireline and wireless networks, and in how the Commission and states have regulated them.

It is those technical underpinnings of the LRN method that make severing number portability from its original and statutorily-mandated “local” roots so challenging. As it happens, though, service providers are already transitioning away from those same legacy circuit-switched networks to IP-enabled networks. While IP-enabled networks use the LRN today to identify the service provider serving the dialed number to route calls, they are not limited to the LRN method’s central office code-based method to correctly route calls to ported numbers to the same extent as circuit-switched wireline facilities. It is generally unnecessary to use the called party’s actual geographic location in IP-based routing. And the IP-enabled network elements are not inextricably tied to any particular rate center or geographic area. So while implementing nationwide number portability on IP-enabled networks still would take hard work – requiring coordinated industry-wide standards work, implementation and testing, among other things – IP-enabled networks do not face the same inherent design limitations as traditional wireline and wireless networks.

Verizon thus agrees with the NANC's recommendation that stakeholders focus on implementing nationwide number portability as they transition to ubiquitous implementation of IP-enabled networks.<sup>2</sup> In the meantime, service providers should remain free to consider commercial agreements to support nationwide number portability for their customers, while leaving the existing LNP methodology intact. Removing regulatory underbrush, as proposed in the *NPRM*, and updating industry standards and coordination to govern service providers' call routing arrangements can help service providers begin the longer term transition to nationwide number portability. And it will do so while ultimately giving additional flexibility for service providers to provide consumers with more efficient call routing.

**II. ELIMINATING THE N-1 QUERY AND DIALING PARITY RULES WOULD ENABLE SERVICE PROVIDERS TO DEVELOP MORE EFFICIENT CALL ROUTING LONGER TERM AND HELP START THE TRANSITION TO NATIONWIDE NUMBER PORTABILITY.**

Eliminating the N-1 query and IXC dialing parity rules would help facilitate more efficient longer term call routing arrangements. And ATIS has correctly described how these rules do not comport with a longer-term nationwide number portability environment, in which communications networks would no longer tether a telephone number to a narrowly-defined geographic area. How and when the Commission eliminates the rules, however, should account for implementation of new industry standards and practices and coordination to govern service providers' and database administrators' implementation of any changes to current porting query and call routing methods.

---

<sup>2</sup> North American Numbering Council, *Report on Nationwide Number Portability*, at 11 (May 16, 2016) ("NANC Report").

**A. The Modified Rules Would Better Reflect the Communications Marketplace and the Wide-Area Capabilities of IP-Enabled Networks.**

The proposed rule changes could ultimately provide service providers and their customers more flexibility and choices in the call routing and dialing arrangements available to them. The proposed changes also could create an impetus for industry to begin the collaborative standards and coordination efforts necessary to implement any changes seamlessly for providers and their customers. Potential areas for improvement could include, for example, having the originating service provider (rather than the N-1) uniformly perform the porting query as is now widely done in IP interconnection arrangements, now that LNP capabilities have been implemented virtually nationwide and (subject to some long-standing waivers granted to rural ILECs) across most wireline, wireless and interconnected VoIP providers. Prior assessments of nationwide number portability also suggest that such an approach could simplify query performance and billing responsibilities in situations such as interLATA extended area service that enables local calling to a rate center in a neighboring LATA.<sup>3</sup> And ATIS has found that eliminating the remaining IXC dialing parity requirements could help obviate the need to use the called party's central office code to determine whether a call is interLATA.<sup>4</sup> More consistent with the consumer experience today, service providers could instead process all calls consistently irrespective of distance, including in cases where a number originally assigned in a different

---

<sup>3</sup> See Alliance for Telecommunications Industry Solutions, *Technical Report on a Nationwide Number Portability Study*, ATIS-1000071, at 22-23.-23.9 (June 2016) (“ATIS Report”); North American Numbering Council Local Number Portability Administration Working Group, *White Paper on Non-Geographic Number Portability*, at 11 (Aug. 30, 2016) (“LNPAWG White Paper”).

<sup>4</sup> See ATIS Report at 22 (June 2016).

LATA is ported into the same LATA where the call originates. The proposed rule changes would enable service providers and standards bodies to meaningfully explore these possibilities.

By that same token, however, how and when the Commission repeals the rules must account for service providers' need to develop standards and practices to ensure that they can uniformly implement new dialing and call routing arrangements on a nationwide basis. If the Commission eliminates the N-1 query rule, for example, service providers still need to ensure that *someone* in the call flow other than the "N" carrier performs the LNP database query. The Commission should not implement the rule change in a way that would allow a service provider to unilaterally cease performing queries without regard to the impact on consumers and other service providers' networks and costs. Likewise, while lifting dialing parity requirements could obviate the need to use the dialed central office code to identify whether a call is interLATA, ILECs should not have carte blanche to impose 1+ toll dialing on what would otherwise be local wireless calls to wireless consumers. Also, some method would be needed to ensure that local calls continue to be treated that way, for both routing and rating purposes. For example, a called party's carrier's LRN may be associated with a rate center not local to the calling party's rate center, even if the called party happens to be in the same local calling area. In that case, an alternate method would need to determine whether toll charges apply.

**B. Market Forces Should Drive Service Provider Implementation of Any Newly-Permissible Standards-Based Call Routing Arrangements.**

Consumer demand for nationwide number portability may be limited. Service providers will need to weigh the costs and benefits of these changes to best respond to consumer preferences. And development of necessary new industry standards and service providers' implementation of them will take time. If the LNP database query is moved exclusively to the originating switch, for example, system changes may be needed to ensure that the necessary

routing and billing information is available at that point in the network. As a result, N-1 queries may remain a prevalent practice for some time. And the use of 1+ dialing to identify toll calls would need to be revised to account for the possibility that the calling and called parties are both in the same local area when the calling telephone number and dialed telephone number appear to be in different local areas. In addition, any resulting changes to interLATA call processing may implicate state regulatory commission requirements and require changes to billing records and switch software.<sup>5</sup> It will thus take time for service providers to implement the newly-allowable call routing arrangements.

### **III. COMMERCIAL AGREEMENTS WILL MEET DEMAND FOR NATIONWIDE NUMBER PORTABILITY WHILE THE INDUSTRY TRANSITIONS TO IP-ENABLED NETWORKS.**

The recent NANC- and ATIS-led initiatives accurately describe the significant network changes that service providers would need to implement were the Commission to superimpose nationwide number portability over both legacy circuit-switched and IP-enabled networks. Among other things, these include changes to the NPAC, changes to switching equipment and other network architecture supporting call routing, and changes to billing systems, operational support and provisioning systems and other back-office systems and databases. Service providers would incur these burdens regardless of the particular method involved (other than commercial agreements), but the costs would be especially pronounced for legacy circuit-switched networks which, in some cases, would need to be entirely replaced. So, on balance the far better alternative is to undertake the substantial work necessary to incorporate nationwide number portability into the IP transition (i.e. the *NOI*'s "Internet interconnection" option) while

---

<sup>5</sup> See ATIS Report at 14, 40; NANC Report at 7-8; LNPAWG White Paper at 5-6.



ensuring that service providers seeking to offer nationwide number portability through their existing networks remain free to do so through commercial agreements. Stakeholders could then focus time, capital, and personnel resources into nationwide number portability for their networks of the future.

**A. IP-Enabled Networks Will Most Effectively and Efficiently Support Nationwide Number Portability.**

While many IP-enabled service providers currently use the same LRN-based method as legacy TDM networks, IP-enabled networks can give service providers more options and technical flexibility in configuring their call routing arrangements. As ATIS has explained, “in an all IP environment ... routing need not be Central Office code-based” and LRN-dependent.<sup>6</sup> Even today, because there typically is not an intervening “N-1” carrier for IP-enabled networks, the originating service provider typically performs the number portability query. In addition, an IP-based connectivity arrangement between the porting out and porting in service providers does not require the latter to have a physical presence in the former’s LATA or rate center.<sup>7</sup> In contrast, the current LRN-based method is able to support call routing on legacy TDM-based networks, because the consumer’s telephone number is associated with a particular switch in a narrowly-defined geographic area.<sup>8</sup>

Legacy networks, however, are far more limited in their ability to maintain a LRN beyond the customer’s original local area or to otherwise support call routing to and from the

---

<sup>6</sup> See ATIS Report at 39.

<sup>7</sup> *Id.* at 26.

<sup>8</sup> See LNPAWG White Paper at 12 (“The current regulations, standards, and infrastructure were constructed for the TDM network and are based upon a premise that telephone numbers and geography are intertwined.”).

thousands of NPA-NXX combinations that could be ported into their local areas. As ATIS and the NANC explain, enabling nationwide number portability in legacy networks would require a substantial augmentation – if not outright replacement – of individual service provider equipment and other network architecture, billing systems and databases. In addition, industry-wide systems such as the LNPA systems and databases and the LERG™ Routing Guide would require upgrades as well.<sup>9</sup>

To avoid such duplicative costs and burdens and to enable the industry to focus on the deployment of more nimble IP-enabled networks and services,<sup>10</sup> nationwide number portability would be most effectively and efficiently deployed when coupled with the IP transition underlying the “Internet interconnection” option described in the ATIS Report and referenced in the *NOI*.<sup>11</sup> This is not to say, though, that transitioning from the current LRN method would be a simple, low-cost effort for IP-enabled networks. Many IP-enabled service providers have built their operational support systems around the legacy network geographic construct, even if they do not require central office code-based routing. Multiple issues related to industry standards and guidelines, changes to individual provider systems, processes and equipment for call processing, and network routing will have to be addressed and resolved, and then a migration plan for existing network elements, systems and business processes will have to be established for IP-enabled networks.

Importantly, during the transition period, service providers who want to support location portability in their networks, i.e. enabling consumers to port a number to a different carrier in a

---

<sup>9</sup> See NANC Report at 9-10.

<sup>10</sup> See NANC Report at 10-11.

<sup>11</sup> See ATIS Report at 26-27; *NPRM/NOI ¶¶* 9-10.

different geographic area, should remain free to enter into commercial agreements. Wireline providers and smaller wireless providers can, for example, use third party entities (such as CLECs with a nationwide presence) to route interLATA calls to ported numbers under existing technical standards using the existing LRN method. These arrangements effectively replicate the roaming-oriented arrangements that enable nationwide service providers to provide what appears as “location portability” to consumers.<sup>12</sup> Otherwise nationwide number portability is best implemented nationally and consistently across service providers, an approach the IP transition will facilitate. Service providers of all types and sizes, including smaller wireless providers, will avoid the substantial and duplicative network upgrades for their legacy networks that the other adaptations of the LRN method discussed in the *NOI* would create.

**B. The National LRN and NGLRN Options Would Require Substantial Upgrades to Legacy Networks.**

The National LRN and Non-Geographic LRN (“NGLRN”) options described in the *NOI* are alternative methods of enabling service providers to use LRNs outside of the local calling area in which they were originally assigned. The National LRN option would enable service providers to support LRNs in multiple regions to identify the current customer’s service market. NGLRNs would be a new form of LRN with accompanying gateways and databases to enable call routing. *Both* will necessitate comprehensive re-working of the current LRN method throughout both existing and future networks, including accompanying standards, uniform implementation of an originating query if either is to be implemented reliably, and substantial changes to networks. And both would become outdated once the IP transition is complete.<sup>13</sup>

---

<sup>12</sup> See ATIS Report at 11-12; LNPAWG White Paper at 13.

<sup>13</sup> The remaining option described in the *NOI* – the solution based on the iconectiv GR-2982-CORE specification for Portability Outside the Rate Center (PORC) – is dependent on

**National LRN.** While the engineering nuts and bolts of how the National LRN would function are fairly straightforward, implementing it would be extremely costly and time-consuming. The NPAC's system processes currently require that the LRN and called party telephone number (NPA-NXX) be associated with the same rate center and would need to be updated to support the newly untethered LRN. ATIS also noted that service providers would need to assess their existing network switching equipment – which, in many cases, are end-of-life or not otherwise undergoing further development, and can only support a limited number of NPA-NXX combinations.<sup>14</sup> The porting in and porting out service providers will need to establish a business arrangement if the former does not have a presence in the latter's area.<sup>15</sup> Routing functions need to be updated as well to ensure that routing (local v. interLATA) is based exclusively on an analysis of the dialed number, without reference to what was a geographically limited LRN. Customer and intercarrier billing and settlement practices will need to be updated since the jurisdiction of calls will no longer be tied to a particular area. There may be 911 impacts if the PSAP's network is only capable of handling calls for a limited number of NPAs; such limits could affect a PSAP's ability to perform a 911 callback or an ALI database query. And database-related costs would be passed on to all carriers (and ultimately to consumers in many cases), such as the costs of NPAC changes.

**NGLRN.** Like the National LRN method, implementing NGLRNs would be extremely costly and time-consuming. This method requires establishment and connectivity to a special

---

investment in SS7 TCAP development and is not practical given the industry's ongoing transition to an all IP network.

<sup>14</sup> See ATIS Report at 13.

<sup>15</sup> *Id.* at 13.

gateway facility to enable delivery of calls to the terminating carrier. It requires the development of a new system of non-geographic LRNs, even as operational support systems and network processes have been designed based on today's number assignment and porting methods. And it implicates the same jurisdictional issues as the National LRN method. Further, the NGLRN method would introduce non-geographic telephone numbers (NGTNs) as yet another classification of the 10-digit numbering resource, but further analysis is needed as to why such a new resource is needed or what its use cases might be – particularly given that the resource would be limited to wireless or VoIP services and thus depart from the Commission's traditional technology-neutral approach to numbering assignments.<sup>16</sup> And new numbering administration charges associated with supporting the new types of number resources would be passed on to all carriers, even those with no need or use for NGTNs.

#### **IV. THE COMMISSION SHOULD NOT IMPOSE NEAR TERM POLICY CHANGES ON TEN-DIGIT DIALING AND NUMBERING ADMINISTRATION.**

*Ten-Digit Dialing.* The *NOI* correctly acknowledges that the timing and manner of nationwide number portability implementation will need to account for the widespread existence of seven-digit dialing.<sup>17</sup> A telephone number's last seven digits are shared by other users in most other NPAs, but networks will need to continue to be able to deliver the call to the right called party; if the telephone number's NPA is not used as a differentiator, some other mechanism would be needed. Because an NPA's NXX code will no longer be tied to a single local calling area, the Commission will need to account for the possible eventual need for uniform nationwide 10-digit dialing, both to ensure accurate call routing and to mitigate customer confusion. But

---

<sup>16</sup> See ATIS Report at 21.

<sup>17</sup> See *NPRM/NOI* ¶ 46.

there is no need for the Commission to act disruptively here. Just over half of all NPAs maintain 7-digit dialing in accordance with directives from state regulatory commissions,<sup>18</sup> but that number has been trending downward. As area code overlays (which require 10-digit dialing) have become the sole form of area code relief over the last 10 years, the impact to consumers of mandatory 10-digit dialing has become less foreign or significant. As a result, any nationwide number portability efforts will be able to build upon this trend in the future in a way that minimizes inconvenience to consumers, as well as the need for service providers to prematurely replace or augment switching facilities.

***Numbering Administration.*** Finally, it is premature to consider substantive changes to numbering resource administration in this proceeding.<sup>19</sup> With NANP exhaust projected beyond 2047, there is no exhaust concern that warrants immediate, drastic changes to how numbers are allocated. Revamping the different numbering administration systems would have broader significance for consumers, competition, and for the contribution burdens of the service providers who support the different administrators. Whatever the competitive merits of nationwide number portability, severing a telephone number from its particular geographic area will affect consumers, service providers, and state regulators in many important ways that should be fully vetted independent of any Commission effort to revisit its numbering administration policies.

---

<sup>18</sup> See NANPA, *NPA Dialing Plans Report*, <https://www.nationalnanpa.com/enas/npaDialingPlansReport.doc> (approximately 51.1% of U.S. NPAs allow 7-digit dialing for local calls within the same NPA, 51.4% when including the U.S. and the territories of American Samoa, Guam, CNMI, USVI and Puerto Rico).

<sup>19</sup> See *NPRM/NOI* ¶ 68.

## CONCLUSION

The Commission should adopt and carefully implement its proposed changes to the N-1 query and IXC dialing parity rules, while focusing stakeholder efforts on incorporating nationwide number portability into industry's broader transition toward all-IP networks. Commercial agreements can continue to meet service provider demand for location portability without the need to impose costly and burdensome upgrades across all service providers' legacy networks.

Respectfully submitted,

/s/ Robert G. Morse

William H. Johnson  
Of Counsel

Gregory M. Romano  
Robert G. Morse  
1300 I Street, N.W.  
Suite 500 East  
Washington, DC 20005  
(202) 515-2400

*Attorneys for Verizon*

December 27, 2017