



A Public Interest Perspective on Local Number Portability: Consumers, Competition and Other Risks

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I. Executive Summary¹

Before the Commission finalizes the selection of a vendor for the Local Number Portability Administrator (“LNPA”) contract, the Commission should take this opportunity to reconsider the future role of the number portability system and of the LNPA in relation to market competition, public safety and the IP technology transition. The functionality of today’s LNP platform extends well beyond providing routine number porting services between telecom carriers. It has evolved into a significant component in the greater ecosystem of telecommunications competition, public safety and technological evolution. As a result, any changes to the LNPA now will have broader and evolving public interest implications.

The ability of the LNPA to impartially operate to serve the public interest is critical. In the Commission’s LNPA selection proceeding, a number of smaller regional and rural providers have argued that appointing Telcordia, a subsidiary of Ericsson, as the LNPA would threaten the industry’s competitive environment. Since consumer switching (churn) is such a costly and key aspect of industry competition, competitive neutrality is critical. There are legitimate concerns that Ericsson, a leading manufacturer of equipment for telecom companies, is closely tied to the largest carriers and has other conflicts as well.

Smaller rural and regional carriers have also expressed concerns about the potential increased total costs they would face from an LNPA transition, and the comparatively fewer resources they have for such a massive IT transition as small and mid-sized carriers that disproportionately operate in rural areas where consumer options are already limited. Potential new entrants could face these same challenges. More generally, the Commission should address the way the current numbering portability system disadvantages non-national carriers by failing to port consumers’ numbers between regions (LATAs) when a regional carrier acquires customers from areas where it does not operate and own switches. The North American Numbering Council’s (“NANC”) vendor selection process could have been an opportunity to correct this number portability disadvantage for smaller carriers, and yet the Request for Proposal (“RFP”) failed to specify any particular requirements for supporting nationwide porting.

Other stakeholders express concern about impacts on technological developments, including the competitive implications of transitioning to private, non-integrated and possibly separately-priced registries in the course of the IP transition. Telcordia seems to have a view that the

¹ **Support for this report was provided by Neustar, Inc. The views contained herein are those of the authors.**

Number Portability Administration Center (“NPAC”) can be replaced with third party private electronic numbering (ENUM) registries, presumably for an additional fee to the carriers, as the TDM-based network transitions to an IP-based network. However, Neustar appears to have assumed ENUM functionality will be integrated within the NPAC. There is a legitimate concern that private ENUM registries, as opposed to public registries such as the NPAC, might lead to a less competitive telecom sector after the IP transition.

Public safety and law enforcement agencies have registered a separate set of concerns about losing current LNPA services they rely on today, while federal agencies have noted national security concerns about transitioning to a foreign-owned vendor or utilizing foreign code in the NPAC.

A common thread among most commenters is that their concerns were not adequately addressed during the RFP process overseen by the NANC’s Selection Working Group (“SWG”).² This paper analyzes these concerns and finds them credible and potentially having critical policy impacts. The LNPA has also evolved to provide other value-added services important to competitive carriers and/or public safety agencies, yet it is not clear which are included in the scope of work for the next LNPA.

For all of these reasons, we believe the Commission should review and clarify the future role of the number portability system and the LNPA through a public notice and comment rulemaking *before* finalizing a vendor selection.

² NANC is a federal advisory committee to the FCC that was charged with working with North American Portability Management LLC (“NAPM”) to make a recommendation for the next LNPA contract. NANC, in turn, created a Selection Working Group (“SWG”) to work with the NAPM on the selection process. The NAPM, with input from the SWG, created the request for proposal documents and conducted the initial evaluation process. The NAPM members are all telecom service providers. NAPM in turn, created a subgroup of the NAPM, the Future of Number Portability Administration Committee (“FoNPAC”), to carry out the selection process delegated to the NAPM.

II. Background: Number Portability and Competition

On April 24, 2014 the North American Numbering Council (“NANC”) submitted its recommendation to the Commission’s Wireline Competition Bureau that Telcordia Technologies, a subsidiary of Ericsson doing business as iconectiv, serve as the next Local Number Portability Administrator (“LNPA”) after Neustar’s contract expires on June 30, 2015. A number of commenters to the proceeding representing large carriers (e.g., US Telecom, CTIA) as well as Telcordia itself, have urged the Commission to immediately finalize the selection of Telcordia as LNPA despite the fact that there has been no broader public interest analysis or rulemaking proceeding related to the actual, appropriate and needed role of the LNPA going forward.

A. The LNPA’s Role and Contract Touches on Core FCC Mandates

The goals of promoting universal and affordable communications, ensuring updated facilities and safeguarding life and property are all central to the Commission’s mandate. The very first section of the Communications Act of 1934 states the Commission was created:

For the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to **make available, so far as possible, to all the people of the United States**, without discrimination . . . wire and radio communication service with **adequate facilities** at

reasonable charges, for the purpose of the national defense, [and] for the purpose of **promoting safety of life and property** through the use of wire and radio communication
....³

The LNPA touches each of these issues. In the context of today’s communications industry, the phrase “to all people of the United States” clearly encompasses underserved areas, many of which are rural. The admonition to promote universal service “at reasonable charges” addresses the original intent that number portability would spur competition and reduce costs to consumers. “Adequate facilities” is a broad reference to up-to-date technology, subject to change as such technology evolves. Today’s ongoing IP transition is a logical example. The interests of public safety agencies are encompassed in the phrase “promoting safety of life and property.” The downstream impacts of the LNP contract potentially threaten these critical objectives. As such, the Commission must carefully consider each of these if it is to properly execute its Congressional mandate.

B. Number Portability, Switching Costs and Competition

Prior to number portability, changing one’s phone number was an unavoidable aspect of changing service providers. It imposed a significant switching cost that burdened consumers and reduced effective competition. This changed with the Telecommunications Act of 1996, which included a provision that allows consumers to keep their numbers when switching

³ Communications Act of 1934 (as amended), Sec. 1 (codified at 47 U.S.C. § 151).

service providers “to the extent technically feasible.”⁴ Initially, the process was far from perfect, but it continues to improve. For example, originally number portability did not apply to mobile phones, IP calling or certain other instances, but now mobile and IP phone numbers can be ported. Today more than 2,000 telecom service providers, public safety and law enforcement agencies rely on LNP services. Number portability has become increasingly ubiquitous, yet there are still situations where customers of regional and rural carriers cannot transfer a number between certain geographical areas, a gap in the number porting system that operates to the disadvantage of rural and other non-national carriers.

High switching costs remain a major impediment to mobile market competition in particular. A recent issue of *Consumer Reports* (February, 2015) presents survey results showing that 27 percent of mobile broadband consumers who are dissatisfied with their mobile broadband service provider believe they cannot switch carriers due to long-term contracts, early termination fees and other barriers that tie them to carriers.⁵ Of course, subscribers *can* switch carriers, but relatively few do primarily because of the multiple strategies that the largest carriers use to create both the perception and the reality of substantial financial penalties, loss of time and uncertainties about retaining your data or even, in some cases, your phone number. These strategies include not only long-term service contract lock-in with substantial early termination fee penalties (ETFs) that

⁴ 47 U.S.C. § 251(b)(2).

⁵ Marta Tellado, “From the President: Helping You Get the Right Cell Plan,” *Consumer Report*, at 3 (February 2015), available at <http://www.consumerreports.org/cro/magazine/2015/02/from-our-president/index.htm>.

typically exceed \$300, but also the rapid increase in group share plans (which can greatly inflate the lump sum cost of ETFs), device incompatibilities across wireless providers,⁶ constraints on device unlocking, and continuing limitations on local number portability.⁷ And when a consumer has a reduced willingness to switch carriers, it becomes more likely that they will tolerate poor service or anti-competitive practices.

A robust, neutral, truly national LNP can mitigate switching costs by reducing costs and porting delays to consumers. As the Competitive Carriers Association (CCA) has stated: “Competition in the telecommunications marketplace depends on consumer confidence in the ability to seamlessly move between carriers – and among wireline, wireless, and VoIP carriers – without changing telephone numbers.”⁸ To the extent a change in LNP services and/or pricing makes this process more difficult, the telecom industry risks becoming less competitive as a result.

⁶ See Nicholas Economides, “Broadband Openness Rules Are Fully Justified by Economic Research,” *Communications and Strategies*, 84(4): 1-25 at 9 (2011); Wireless Local Number Portability Website, “Transfer your Number to C Spire,” available at <http://www.wirelesslocalnumberportability.com/providers-C%20Spire/cs> (“In some instances, wireless handsets of different wireless telephone companies are incompatible. If you switch from AT&T to C Spire, you may need to purchase a new handset, even if you retain the same phone number.”)

⁷ Phone number portability is administered so that it works well only for national carriers. Consumers often don’t have the option to keep their number when moving from a national to a non-national carrier. See, e.g., Letter from C. Sean Spivey, Competitive Carriers Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 13-97 (filed May 23, 2014).

⁸ *Ex parte* filing of the Competitive Carriers Association, CC Docket No. 95-116; WC Docket No. 07-149; WC Docket No. 09-109 (March 21, 2014) (“CCA *Ex parte* from March 21, 2014”).

A specific problem that should be addressed as part of a Commission review of the future role of the LNPA is the fact that the number porting system puts non-national providers at a competitive disadvantage. While nationwide providers can port the number of any new customer, a carrier like C Spire – a southern regional carrier based in Mississippi – has long complained that college students and other new residents who say they would like to switch from a national carrier to C Spire’s less expensive service end up not doing so because numbers cannot be ported from areas (most of the country) where C Spire does not already operate. In other words, number portability is literally *local* – not *national* – unless the provider has a nationwide footprint. The Competitive Carriers Association (CCA) has explained this in FCC filings:

[A] significant number of [CCA’s] rural and regional members have experienced problems with porting-in wireless numbers from disparate parts of the country. As a result, non-nationwide carriers are placed at a competitive disadvantage. . . . Number portability expands competition . . . and these positive policy outcomes are diminished when non-nationwide carriers do not have the same capability as the nationwide carriers. . . . If the Commission were to provide a directive to the NANC and the LNPA to break down these artificial [geographic] barriers – again, for which there are no technical or legal justifications – competition and enhanced mobility would be

further promoted through the [LNP] system.⁹

While the Commission selects the LNPA, the cost of the service of providing number portability is paid for by the telecom service providers themselves. But the competitive environment is disrupted when the cost of this service is unequally burdensome for certain industry participants and the benefits are unequally distributed among them due to historical conditions and other factors beyond their control. Failure of LNP technology to keep pace with evolving telecom technology – such as failing to fully support the IP transition through the NPAC – is another risk. Therefore the Commission should consider the impact of pricing and service provision on all participants, including its potential impact on marketplace competition and consumer welfare.

C. The Wireless Industry’s Competitive Situation is Steadily Declining

Most economists today agree that enhanced competition is generally the most effective method of advancing the Commission’s mandate to promote the universal availability of advanced communications services at affordable prices. As the Commission articulated in its 17th *Wireless Competition Report*:

Promoting competition is a fundamental goal of the Commission’s policymaking. Competition has played and

⁹ *Ibid.* See also Comments of Competitive Carriers Association, In the Matter of Technology Transitions and Numbering Policies for Modern Communications, GN Docket No. 13-5, WC Docket No. 13-97, at 7-8 (filed March 31, 2014).

must continue to play an essential role in the mobile wireless industry – leading to lower prices and higher quality for American consumers, and producing innovation and investment in wireless networks, devices, and services.¹⁰

The wireless industry is already highly consolidated and becoming more so. Exhibit 1 shows the increase in market share by the four largest players and the subscriber decline from the other publicly traded wireless carriers. This trend toward consolidation and domination by the two largest carriers (Verizon and AT&T) is equally clear in the widely divergent EBITDA margins of the largest and smallest carriers (see Exhibit 2).

The mobile broadband market has grown steadily more concentrated and less competitive since 2010, as the Commission has concluded each year since 2010 in its mobile market competition reports (declining to find “effective competition”),¹¹ as the Antitrust Division has concluded,¹² and as virtually every mobile ISP other than Verizon and AT&T has stated repeatedly in pleadings before the Commission.¹³

¹⁰ *Annual Report and Analysis of Competitive Mobile Conditions with Respect to Commercial Mobile Services*, Sixteenth Report, WT Docket No. 11-186, 28 FCC Rcd 3700, 3958 ¶ 410 (2013) (“16th Wireless Competition Report”).

¹¹ *Ibid.*

¹² *Ex parte* filing of the United States Department of Justice, WT Docket No. 12-269 (April 11, 2013) at 8. (“Carriers do have the ability and, in some cases, the incentive to exercise at least some degree of market power, particularly given that there is already significant nationwide concentration in the wireless industry.”)

¹³ The Competitive Carriers Association has emphasized the anti-competitive effects of ongoing industry consolidation in several recent filings, see Comments of Competitive Carriers Association,

Measures of industry consolidation indicate the wireless industry is already highly concentrated and is becoming more concentrated year after year. The Commission calculated the Herfindahl-Hirschman Index (HHI) at 3,027 for the wireless industry in 2013, well above the 2,500 benchmark for a highly concentrated industry.¹⁴ It has undoubtedly increased significantly since 2013 due to the large amount of merger and acquisition activity over the past year.¹⁵ Regional, rural, and pre-paid competitive carriers are disappearing as the industry consolidates.¹⁶ From the wireline perspective, the U.S. has seen the majority of the CLECs disappear over the past 10-to-15 years, reducing wireline competition as well.

Policies Regarding Mobile Spectrum Holdings, WT Docket No. 12-269 (Nov. 28, 2012) (“CCA Comments in 12-269”) at 4. (“Consolidation in the wireless industry, as measured by the Herfindahl-Hirschman Index (‘HHI’) increased from 2,151 in 2003 to an alarming 2,848 in 2010 (where an HHI of greater than 2,500 indicates a ‘highly concentrated’ market).”)

¹⁴ *Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, Seventeenth Report at ¶ 33 (December 18, 2014) (“17th Wireless Competition Report”). Available at: https://apps.fcc.gov/edocs_public/attachmatch/DA-14-1862A1.pdf. The Herfindahl-Hirschman Index (“HHI”) for the wireless industry has increased from 2693 in 2008, to 2874 in 2011, to 3027 in 2013. *Ibid.* HHI is the metric used for quantifying the amount of market concentration. It is calculated by summing the squares of the market shares of each of the firms in the industry.

¹⁵ Major recent mobile industry mergers and further consolidations of spectrum holdings include Verizon/SpectrumCo, AT&T/NextWave, AT&T/Alltel, T-Mobile/MetroPCS, Sprint/Clearwire, AT&T/Leap, and Verizon/Cincinnati Bell wireless transactions. Other telecom mergers include, Comcast/Time Warner Cable (pending), FiberLight/XO, and SureWest & Zayo/AboveNet.

¹⁶ CCA Comments in 12-269 at 4 (“the number of nationwide wireless carriers has declined from six in 2003 to four in 2012, and during that span, several ‘regional and rural facilities-based providers have exited the marketplace through mergers and acquisitions”) [citation omitted].

Increasing consolidation and the dominance of the two largest mobile carriers has been lamented by competitive carriers and consumer advocates alike. In the two-year period between the 14th and 16th Wireless Competition Reports, AT&T's and Verizon's combined share of total wireless industry revenue rose from 60 percent to 67 percent,¹⁷ while their combined share of the lucrative post-paid market is even greater. CCA President Steve Berry accurately summed up the general trend in mobile market consolidation and competition: "Just a few years ago, the US wireless industry enjoyed robust competition. . . . Unfortunately, the market has changed, and the FCC's most recent [16th] wireless competition report confirmed that the wireless industry is in imminent danger of reverting back to the duopoly of its early days."¹⁸

The reasons for the decline in competition include a maturation of the industry that increasingly depends on economies of scale, the increased capital intensity of the industry and other barriers to entry that are outside of the Commission's control. In the recent spectrum holdings proceeding, both CCA and the two smaller, nationwide mobile carriers (Sprint and T-Mobile) emphasized how increasing market consolidation, low-band spectrum dominance, the ability to over-charge for special access backhaul and data roaming, among other factors, hamper their ability to

¹⁷ See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services, WT Docket No. 09-66, Fourteenth Report (2010) at ¶30; 16th Competition Report at ¶2.

¹⁸ Stephen Berry, "FCC: Act Now as Wireless Duopoly Looms," *LightReading*, (December 6, 2013) available at: <http://www.lightreading.com/fcc-act-now-as-wireless-duopoly-looms/a/d-id/706840>.

compete effectively with the two largest mobile carriers.¹⁹ Last year T-Mobile filed a petition with the Commission asking for greater protections against unreasonable data roaming charges, an anti-competitive practice that T-Mobile said harms not only its customers but also results in higher prices for Verizon and AT&T customers.²⁰

Additionally, a recent report by SNL Kagan notes:

Small carriers traditionally survived by going to markets underserved by the big four and offering cheaper plans. But the increased use of broadband has made expensive 4G network investments and spectrum purchases necessary, and smaller carriers have shallower pockets than their big rivals.²¹

The same SNL Kagan article notes that in 2014 nTelos sold spectrum and exited a large portion of its wireless market, as did

¹⁹ See, e.g., CCA Comments in 12-269, supra note 13, at 6-7 ("The Commission must recognize that control of the lion's share of prime broadband spectrum by one or two carriers makes it increasingly difficult for new entrants or other carriers to gain access to spectrum, which in turn prevents access to all other critical inputs, which in turn inhibits effective competition in the industry").

²⁰ Petition for Expedited Declaratory Ruling of T-Mobile USA, Inc., *Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, WT Docket No. 05-265 (May 27, 2014) at 4. "Indeed, AT&T's recent acquisition of Leap Wireless International, Inc., including its Cricket brand, has further reduced the number of competitors in the wireless market and increased AT&T's market share, thereby also further limiting AT&T's need for roaming and reducing the number of roaming providers in the marketplace." *Id.* at 8.

²¹ Deborah Yao, "Small Wireless Carriers Struggle to Compete in 4G Mobile World" *SNL Kagan Media and Communications Report* (December 4, 2014). Available at Westlaw 34881289.

U.S. Cellular, Cincinnati Bell and Alaska Communications exited the wireless market entirely, selling spectrum and other assets to the nationwide carriers. Despite many reasons for consolidation being outside the Commission's control, it must be vigilant to protect remaining competitive forces, or at least not harm them, where it is has the ability to do so.

One of the few bright spots with respect to additional telecom competition has been VoIP services that allow one's broadband connection to substitute for basic phone service. In addition, an increasing share of households is going "mobile only" and relying on their more indispensable mobile phone service rather than absorb an additional expense for wireline phone service at home.²² Moreover, the transition to an IP-based numbering system can eliminate the remaining situations where consumers are unable to take advantage of number portability.²³ To a certain extent, the emergence of IP-based telephone providers offsets the decline of CLECs in wireline competition. The Commission must take care to ensure any changes to the LNPA don't stifle these emerging competitors.

²² According to Pew Research, 41 percent of American homes have only mobile phone service. See: <http://www.pewresearch.org/fact-tank/2014/07/08/two-of-every-five-u-s-households-have-only-wireless-phones/>.

²³ As the Competitive Carrier Association has explained before the Commission, rural and regional operators are at a disadvantage as compared to national operators by virtue of their inability to port-in wireless numbers from other parts of the country into their service areas. See CCA *Ex parte* from March 21, 2014.

D. Competitive Concerns are Most Acute in Rural Areas

Congress recently reaffirmed the Commission's mandate to support competitive choice in rural areas and also to encourage the market entry of small and minority-owned firms. Congress stated in the 2012 Spectrum Reform Act that the Commission must:

[E]nsure that small businesses, rural telephone companies, and businesses owned by members of minority groups and women are given the opportunity to participate in the provision of spectrum-based services.²⁴

The greatest competitive challenges are in rural areas. Smaller operators are disproportionately important in providing consumer choice and competition in underserved rural areas, where consumers typically have a choice of three or fewer providers.²⁵ Exhibits 3 and 4 illustrate the lower level of competition in rural areas.

As these bar charts show, wireless competition decreases dramatically in rural areas. Wireline competition, to the extent there is any, is greatly diminished in rural areas as well since the cost of deploying wireline infrastructure increases more rapidly in these areas. The cost of deploying broadband, including state of the art fiber

²⁴ 47 U.S.C. § 309(j)(4)(D) (2012). While this statement applies to mobile competition, the concepts are equally applicable to wireline providers.

²⁵ Raul Katz, Javier Avila & Giacomo Meille, *Economic Impact of Wireless Broadband in Rural America*, Telecom Advisory Services, LLC, available at <http://competitivecarriers.org/wp-content/uploads/2011/02/Economic-Study-02.24.11.pdf>.

networks, is prohibitive in these areas without government subsidies. These broadband services are precisely the ones that enable new IP-based competition.

Although industry consolidation is making the Commission's mandate to support rural and inclusive competition more challenging, these competitive neutrality objectives clearly apply to number portability. The FCC's *Third Report and Order on Telephone Number Portability* (1998) stated:

[T]he way carriers bear the cost of number portability: 1) must not give one service provider an appreciable, incremental cost advantage over another service provider when competing for a specific subscriber, and (2) must not disparately affect the ability of competing service providers to earn a normal return.²⁶

The Commission was clearly aware that the potential for disparate impact on different types of services providers could limit competition and sought to prevent such outcomes. XO's recent *ex parte* filing regarding number portability notes that the Commission is compelled to allocate costs so that they are not disproportionate to revenue, even if one category of players is forced to pay a larger portion of shared costs.²⁷ Small and rural carriers seem particularly concerned about disproportionately expensive transition

²⁶ *In the matter of Telephone Number Portability*, Third Report and Order, 13 FCC Rcd 11701 ¶ 53 (1998).

²⁷ *Ex parte* filing of XO Communications, . WC Docket No. 10-90, WC Docket No. 11-95, WC Docket No. 13-97, WC Docket No. 07-243; CC Docket No. 95-116; CC Docket No. 01-92; WC Docket No 99-200 (November 26, 2014) ("XO *Ex parte* from November 26, 2014").

costs and lost services they currently rely on Neustar to provide at no additional cost.

Smaller carriers that benefit from the current level of LNPA services are most vulnerable to an increase in LNP costs – including the high costs and uncertainties of a LNPA transition – as well as from failed, delayed, or errant number-porting events. They often don't have the infrastructure to handle the tasks that the current LNPA handles (including ecosystem management during the porting process). Most large carriers have automated systems for interaction with the NPAC. In contrast, smaller carriers would generally be much more reliant on Neustar's help desk service (e.g., for mass porting and network management services). Telcordia may not offer the same level of help desk services as Neustar, which would impact smaller carriers disproportionately. Moreover, help desk charges are outside the equal treatment requirement in the LNPA RFP. Given that Neustar's mass porting functionality is proprietary, it's not clear that Telcordia will be able to offer a mass porting functionality at all (for which small carriers currently rely on Neustar, for network management).

III. Lack of Information Hampers Public Participation and Analysis

An analysis of the competing LNPA bids – including the proposed scope of work – is hampered by the lack of publicly available information. For example, neither Neustar's nor Telcordia's RFP response is publicly available in unredacted form. Virtually none of the records the NANC and SWG were

required to keep in the course of their evaluation has been made publicly available. And only very limited information about the two bidders' service plans is in the public domain. Critically, it's unclear if the companies bid on the same scope of work. Information is particularly limited about the Telcordia bid since it doesn't have an operating history as a LNPA for stakeholders to evaluate. As a result, many parties who could be impacted by the change in the LNPA don't have the necessary critical information to evaluate the impact and contribute meaningfully to the official comment process. Consequently, the comment process for this decision of significant policy importance does not meet normally accepted standards for public participation.

A. Apples to Apples Comparison Impossible and Hinders Decision Process

Given the limited disclosure in the RFP responses, and the limited information about the bids from any publicly available sources, it's impossible to conduct a side-by-side comparison of the two RFP responses. Potentially impacted parties have little, if any, information on how, or if they may be impacted. This gives them little reason to have confidence that the Commission is making an appropriate decision. Moreover, their ability to add relevant information or articulate concerns in the Commission docket is hamstrung by this lack of information. Without meaningful input from a wide variety of stakeholders, the Commission is more likely to be making a decision without considering all of the relevant issues and perspectives.

We understand the Commission is limiting access to the RFP responses due to concerns

that if there is another bidding round, it will be hampered by the competitors' access to each other's prior bids. If the Commission holds another bidding round, it would likely be because it acknowledges the current RFP process did not properly include all relevant elements or result in bidding based on an identical scope of work. Thus any future bidding round would likely have a different RFP, minimizing the impact of competitive disclosures. It is hard to understand how this privacy concern over a potentially flawed RFP process outweighs the need for critical stakeholders to be able to inform the Commission of their perspectives.

B. Future Role of NPAC Unclear, Particularly in IP Transition

Not only are the LNPA contract terms unclear, but fundamental industry issues such as the future role of the National Portability Administration Center (NPAC) are also unresolved. Telcordia seems to have a view that the NPAC could be replaced with third party private electronic numbering (ENUM) registries, presumably for an additional fee to the carriers, as the TDM-based network transitions to an IP-based network.²⁸ Neustar, by contrast, appears to have assumed that ENUM functionality should be included within the NPAC.²⁹ The NPAC administrator could have a great influence on the third party ENUM registries market. They might be motivated to use this influence inappropriately if they were also involved in offering ENUM services themselves. Should Telcordia offer its own ENUM service, it could also charge

²⁸ "Inter-Carrier Routing: Capabilities to Support IP Services Interconnection," iconectiv, (May 2014) available at: <http://www.iconectiv.com/collateral/whitepapers/iconectiv-ip-registry-whitepaper.pdf>.

²⁹ Reply Comments of the LNP Alliance, WC Docket No. 09-109; CC Docket No. 95-116 (August 21, 2014).

for two databases, not one (NPAC and ENUM), raising costs to carriers. But the Commission has not evaluated the desirability of unregulated registries on the basis of cost or neutrality impact. There are also technical questions about the feasibility of simultaneously updating multiple private ENUMs and processes for reconciling any discrepancies. In our view, these are some of the policy issues the Commission needs to evaluate and decide in an open and deliberate process *prior to* finalizing a new, long-term contract with either LNPA bidder.

The IP Transition is a critical juncture in the evolution of the telecom industry. The industry will be switching from circuit-switched technology to IP-based packet switched technology, allowing increased technical efficiencies and potentially new services. The IP transition will happen under the watch of the next LNPA contract term. But the full impacts and risks of the transition are still unknown.

The Commission and the telecom industry haven't even set the IP transition requirements for the LNPA and NPAC, leaving no commonly understood set of requirements to guide the LNPA bids.³⁰ The development of ENUM registries is being looked at in ATIS and IEEE. But small carriers generally don't have the same resources to participate in standards development as large carriers do. There was a debate in the NANC about putting URI fields used for IP routing in the NPAC (Neustar supported the fields, but Telcordia opposed), and they are in the NPAC and in use today. As a result, there is a legitimate concern that private ENUM registries, as

³⁰ Jim Falvey and Dave Malfara, "Why the FCC Should Extend Neustar's Contract by Two Years," *Bloomberg Law* (Nov. 3, 2014), available at <http://www.bna.com/why-fcc-extend-n17179910880/>

opposed to public registries such as the NPAC, might lead to a less competitive telecom sector after the IP transition.³¹ In any case, it seems probable that Telcordia and Neustar have different views and assumptions about the future role of the NPAC incorporated into their bids.

Policy decisions of this magnitude should not be left to contract bidders themselves. Rather, they should be made by the Commission, the product of a thoughtful and transparent policy making process. The Commission should conduct a thorough review of its vision for the role of the NPAC and be certain the LNPA contract is administered in a manner consistent with that vision.

IV. Competitive Neutrality Critical

A. Non-Neutral LNPA Could Inhibit Competition

The LNPA must be neutral to facilitate efficient customer switching from one provider to another ("churn"). Minimizing the barriers to consumer choice and churn enhances competition and consumer welfare. But it is also the bane of service providers because it allows customers who are not satisfied to quickly change providers. Churn is expensive even if a service provider adds and loses the same number of customers. This is because each time a new customer is added the service provider incurs various subscriber acquisition costs ("SAC") that can include commissions for a distribution partner, equipment subsidies and other one-time expenses.

³¹ *Ibid.*

SAC expenses average approximately \$350 per subscriber acquisition in the wireless industry.³² The FCC cites UBS research indicating that since 2010, wireless industry churn has averaged between 1.9 percent and 3.0 percent of subscribers per month.³³ At a midpoint of roughly 2 percent per month, a carrier must replace 24 percent, or almost one-fourth, of its subscriber base a year at roughly \$350 each – amounting to \$23.5 billion for the US wireless industry alone!³⁴ This makes churn one of the largest costs for carriers and dwarfs the cost of the current LNPA contract of under \$500 million annually.

Moreover, the fear of churn often forces service providers to forego revenue by improving pricing and/or spending money to improve service quality. This is commonly known as a “competitive response” that is usually good for consumers, but further drives down corporate profits.

To the extent a LNPA is influenced by telecom service providers, the LNPA won't be motivated to aggressively maintain and implement services and processes to facilitate low-cost consumer switching and a highly competitive environment. It would simply be contrary to their interest. The wireless industry stands to save far more money by hampering the LNP

³² See “Appendix: Economics of the Wireless Industry,” MyRatePlan.com, available at http://www.myrateplan.com/cell_phone_buying_guide/appendix. SAC for wireline services are more complex to analyze. However, we believe they are, on average, similar to wireless SAC. There is some evidence that ILEC SAC is lower than CLEC SAC.

³³ 17th Wireless Competition Report at ¶28.

³⁴ Based on 24 percent annual churn and the CTIA estimate of 335.7 million US wireless connections at the end of 2013 from the 17th Wireless Competition Report at ¶20.

administrator, and thus reducing churn, than it can by reducing the cost of the LNPA contract.

An important benefit of an independent and neutral LNPA is that its interests are more naturally aligned with the goal of making the system work equally well for all stakeholders, including consumers. Neustar appears to have gone out of its way to avoid even the appearance of industry ties.³⁵ It also indicates it has unveiled eleven software upgrades over the past fifteen years.³⁶ It's unclear if a LNPA with a financial interest in doing business with the largest carriers will maintain the pace of these updates that facilitate expensive churn for those same carriers.

B. LNPA with Industry Ties Could Face Conflicts of Interest

The telecom industry is heavily interrelated and an LNPA with industry ties can face a multitude of potential conflicts. Telcordia's parent Ericsson is a leading manufacturer of equipment for telecom companies and very dependent on the dominant carriers. But there are other conflicts as well. For example, Telcordia is a leading provider of Local Service Management System (LSMS) and Service Order Administration (SOA) systems (collectively “OSS systems”) that carriers use to access the NPAC, administered by the LNPA. Similarly, Telcordia also administers the Local Exchange Routing Guide (LERG) database

³⁵ See Neustar's Code of Conduct. Available at: <https://www.neustar.biz/about-us/neutralty>.

³⁶ Tangible benefits of Neustar's upgrades include wireline number pooling (1999), intra-carrier pooling (2000), wireless pooling (2002), support for customer technology migrations (2002), VoIP number pooling (2005), IP field implementation (2009) and one-day number porting (2010). See <http://www.npac.com/the-npac/about>.

and the Business Integrated Rating/Routing Database System (BIRRDS) Database. Combining all of these databases and the NPAC in one entity creates opportunity and ability for Telcordia to cement its dominant position (roughly 70 percent market share)³⁷ in the LSMS/SOA market. The large ILECs' OSS systems are from the former Bellcore, which is now part of Telcordia. It is likely that Telcordia's LSMS/SOA services are better integrated with the OSS systems it has a long history of providing to ILECs. Any changes to the NPAC could make it harder for competitive LSMS/SOA services to get information in and out of the NPAC. Additionally, placing a single entity in charge of both the LERG/BIRRDS and NPAC registries will significantly constrain the industry's future options with respect to evolving current numbering infrastructure to support all-IP networks, particularly if Neustar exits the field. These are issues the Commission should closely and openly evaluate – not just based on the letter of the bidding eligibility requirement regulations – but on a thorough understanding of the potential policy implications and risks to the various stakeholders.

C. Telcordia's Neutrality Arguments to Date Are Not Compelling

Those in favor of awarding the LNPA contract to Telcordia make a number of arguments. But these arguments fall short of settling the issue of neutrality. The four main arguments Telcordia puts forth in favor of its neutrality are: 1) Telcordia meets the legal definition of being neutral; 2) that major stakeholders don't object to Telcordia being awarded the LNPA contract; 3) that Ericsson's ownership will not influence

³⁷ Falvey and Malfara, "Why the FCC Should Extend Neustar's Contract by Two Years," *supra* note 30.

Telcordia; and 4) that the LNPA contract award warrants less agency review than a notice-and-comment rulemaking proceeding would provide for.³⁸

The legal details in the first point are beyond the scope of this paper. However from a public policy perspective, we believe the question should not be whether Telcordia meets the technical legal requirements for being neutral. Rather the Commission should be concerned about whether the relevant stakeholders can have confidence that the LNPA is in fact neutral. Even the perception of not being neutral or having conflicts of interest can be enough to discourage stakeholders from sharing of information and cooperating in ways that are often necessary for progress.

Given the number of concerned comments from small and mid-sized carriers, it's clear that stakeholders other than the largest operators are very concerned about Telcordia's possible lack of neutrality. Given the level of their concern, it's hard to imagine these stakeholders will have confidence in Telcordia absent a new and more open evaluation process.

Telcordia insists it will be completely independent from Ericsson in decision making processes. It has proposed that it will have an independent board of directors³⁹ and institute other measures to ensure neutrality, including various firewall-type safeguards between Telcordia

³⁸ See Reply Comments of Telcordia Technologies, Inc. d/b/a iconectiv, WC Docket No. 09-109, CC Docket No. 95-116 (August 22, 2014), at 1-2, 11-34, 51-56.

³⁹ See Comments of Telcordia Technologies, Inc. d/b/a iconectiv, CC Docket No. 95-116; WC Docket No. 09-109 (July 25, 2014) at 13-17.

and Ericsson.⁴⁰ Most recently, Ericsson has developed a new proposal to create a voting trust to hold “a portion” of its interest in Telcordia.⁴¹ But Telcordia’s board or voting trust trustees would still be appointed by Ericsson. And Ericsson’s carrier customers are hurt by the very subscriber churn that the LNPA system is supposed to encourage. It’s unclear how this fundamental conflict of interest can be managed in a manner that would inspire confidence among the diverse groups of stakeholders in the issue.

Far from being a simple vendor contract, the LNPA contract, as this analysis has shown, has significant public policy implications. These policy implications span the industry and include impacts on 1) the industry’s competitive environment; 2) development of new services; 3) public safety and law enforcement agencies; and 4) national security. The sheer range of parties potentially affected, not to mention the potential irreversible effects, call for a thoughtful analysis before implementation.

V. New LNPA Contract Terms May Further Aggravate Consumer Telecom Choice

A new LNPA puts the Commission at risk of inadvertently tilting the scales against the viability of small to mid-sized carriers, rural carriers and new entrants. This would

⁴⁰ See Reply Comments of Telcordia, Inc. d/b/a Inconectiv WC Docket No. 09-109; WC Docket No. 07-149; CC Docket No. 95-116 (September 3, 2014) at 29-30.

⁴¹ See Letter from John T. Nakahata to Marlene H. Dortch at 1, CC Docket No. 95-116, WC Docket Nos. 07-149 & 09-109 (February 9, 2015).

effectively create a new subsidy for the largest carriers. Regional and rural carriers and their customers are already shortchanged by a LNP system that favors the dominant, nationwide carriers by preventing out-of-region number ports into small, rural carriers’ service areas, limiting their abilities to compete against the dominant, nationwide carriers.⁴² In the long-run, Ericsson is beholden to large carriers who order most of its equipment. Stakeholders have expressed the legitimate concern that Telcordia may be considerably less motivated by the need to serve small to mid-sized carriers, rural carriers or new entrants. This causes them to be apprehensive about Telcordia’s impartiality on the pricing and services it offers them.

A. Public Interest Concerns Extend Beyond Porting to Value Added Services

Public interest concerns about the appropriate role of the LNPA are not limited to service switching costs. Like many organizations, the LNPA has incrementally adapted to take on roles in addition to those that were originally intended. Many of these functions serve important roles that should be sustained. While originally known for number porting for customers who wish to keep their phone numbers, the LNPA has evolved to provide other valuable services including:

- 1) Ecosystem management during the porting process to maintain service quality.
- 2) Mass number porting, which includes the ability to route larger quantities of phone numbers in

⁴² See *supra* note 7.

response to major disasters (e.g. rerouting numbers in areas affected by hurricane Katrina). The performance levels and support requirements for these services are not clearly defined in the NAPM's LNPA request for proposal.

- 3) A database service enabling compliance with the Telephone Consumer Protection Act ("TCPA"), through which telemarketers can identify and refrain from calling telephone numbers ported to wireless carriers.
- 4) Local number portability enhanced analytical platform ("LEAP"). LEAP is a subscription-based online portal through which law enforcement agencies can retrieve information about ported telephone numbers on a batch basis. Law enforcement agencies use this service for lawfully getting telephone numbers of suspects in the course of investigations.
- 5) 9-1-1 database synchronization which ensures that 9-1-1 call center databases have accurate location and porting status information on phone numbers.
- 6) Interactive Voice Response System ("IVR") a free, phone-based, dial-in service for U.S. law enforcement agencies and PSAP providers that provides information on up to 20 telephone numbers at a time.

Competitive carriers worry that under the Telcordia bid, the fees for future enhanced services will not be fair/non-discriminatory (e.g. volume pricing would benefit large

carriers)⁴³ and that access to LNPA services might, ironically, create large transition costs for them. Moreover, public safety agencies have come to depend on LEAP and worry that the new RFP does not make LEAP mandatory but instead allows it to be provided at the discretion of the LNPA.⁴⁴ National security agencies are concerned about vulnerabilities to the nation's telecommunications infrastructure.⁴⁵

Consumer groups and smaller carriers are concerned about implications for competition in addition to basic number porting. Specifically, they are concerned about whether a LNPA controlled by a parent whose largest customers are the dominant telecom operators would be eager to support easier customer switching or new and potentially disruptive technologies, such as the IP transition and ubiquitous IP number porting. Such services would benefit consumers but possibly hurt those large carrier customers the parent is dependent upon.

For example, Public Knowledge noted that "if the [LNP] administrator had the incentive to make the process burdensome in order to prevent a consumer from switching from a company it favored, it would quickly undermine the number

⁴³ See Comments of the LNP Alliance, WC Docket No. 07-149; WC Docket No. 09-109; CC Docket No. 95-116 (July 25, 2014) at 22.

⁴⁴ See 2015 LNPA RFP § 11.2, Req. 18 ("The LNPA must agree and acknowledge that the Enhanced Law Enforcement Platform Service is discretionary and elective . . . and is not necessary for the provision of number portability").

⁴⁵ See e.g. the letter from the chairman and ranking member of the House Intelligence Committee, Rep. Mike Rogers (R-MI) and Rep. C.A. Dutch Ruppersberger (D-MD), urging the Commission to consult with national security agencies before finalizing a decision on the LNPA. Available at: <http://www.fcc.gov/article/doc-329843a6>.

portability system . . .⁴⁶ The consumer advocacy group further stated “that were the local number portability administrator permitted to skirt the neutrality rules in place today, or if there was any disruption in the portability process, it would significantly damage consumers’ confidence in the process and their ability to take advantage of choices available in the market today.”⁴⁷ We believe these concerns are legitimate and deserve public notice and comment.

B. Price, Service and Policy Discrimination Concerns

Neither Telcordia nor Neustar would be permitted to engage in pricing that directly harms smaller carriers. For example, the LNPA may not port slower to small carriers (i.e. unequal service) or provide significant quantity discounts (i.e. direct price discrimination). However, Telcordia could withhold the value added services smaller carriers need the most and impose high transition costs that disproportionately impact smaller carriers.

Smaller carriers are concerned about indirect discrimination. Wireless carriers and CLECs use porting services more than larger ones, particularly the ILECs. This is due to several factors. First, ILECs face less competition – in many markets there are no other consumer wireline options. As a result, wireline switching rates are lower than wireless switching. Additionally, for historical reasons, ILECs have larger reserves of assigned numbers and need to access (and pay for) the assigned number pool. Other carriers are not able to acquire new numbers until they use 75 percent of

their existing number inventory. As a result, non-ILECs must use number pools more frequently.⁴⁸ The use of the NPAC for porting or for accessing numbering pools increases transition risk and consequently monitoring cost. The carrier using the NPAC must verify that the customer switch worked correctly and the calls are being completed correctly. If not, it must follow-up with the LNPA if there are problems as opposed to handling the issue internally.

It’s counterproductive, from a competitive perspective, to have a situation where the industry group providing more competitive options in multiple markets (the wireless industry) is penalized with the highest customer switching cost for doing so, while the one with the least competition (ILECs) is rewarded with the lowest customer switching costs. Moreover, the current LNPA selection process has not considered the implications of LNPA transition cost, notwithstanding the serious implications and potential impacts of these issues for smaller carriers. As discussed below, given that such transition costs are generally relatively fixed, not scaling proportionately to size, they are likely to hurt smaller carriers the most.

C. Small to Mid-Sized Carriers’ Concerns

Small to mid-sized carriers have particular concern about the transition costs they might be forced to bear. Working with a new LNPA might require carriers to adopt new software, processes, and other technology. Such transition costs are likely to be largely independent of carrier size (fixed) and thus impact smaller carriers more severely than

⁴⁶ See Comments of Public Knowledge, WC Docket No. 07-149; WC Docket No. 09-109; CC Docket No. 95-116 (September 12, 2012) at 2.

⁴⁷ *Ibid.*

⁴⁸ For a detailed analysis of the usage of NPAC services by different types of carriers, see *XO Ex parte* from November 26, 2014.

larger ones. Also, small and mid-sized carriers may, on average, be less prepared to handle disruptions during a transition due to their weaker financial positions.⁴⁹ Neither the Commission nor Telcordia has provided information about these transition costs or contingencies for disruption.

One recent study by economist Hal Singer estimates that transitioning the NPAC to a new vendor could result in an estimated \$1.14 billion increase in operating costs for carriers during the first year.⁵⁰ The study predicts that approximately 12 million customers could be adversely affected by the transition, due primarily to errors. We expect that while the dominant national carriers will ultimately pass these costs along to consumers in the form of higher prices, rural and other smaller carriers will be less able to offset what could be a disproportionate increase in their costs. While 80 percent of carriers pay less than \$1000 per month for LNP,⁵¹ their transition costs could be much higher. For them the lower price for LNPA is illusory.

The small and mid-sized carriers' concerns are amplified by the lack of their involvement in the Commission's SWG process. The smallest carriers participating were Level 3 and XO Communications,⁵²

⁴⁹ For a discussion of concerns of smaller carriers see Comments of Frontier, CC Docket No. 95-116; WC Docket 09-109 (March 21, 2014).

⁵⁰ See Hal Singer, Addendum to "Estimating the Costs Associated with a Change in Local Number Portability Administration" at 2, *attached to* Letter from Aaron Panner, Counsel, Neustar, Inc. to Marlene Dortch, Secretary, FCC, CC Docket No. 95-116, WC Docket No. 09-109, at 1-2 (Jan. 26, 2015).

⁵¹ See Letter from Aaron M. Panner, Counsel, Neustar, Inc., to Marlene H. Dortch, Secretary, FCC, CC Docket No. 95-116, WC Docket No. 09-109 at 2 (September 23, 2014).

⁵² *Ex parte* filing of the LNP Alliance, CC Docket No. 95-116; WC Docket 09-109 (December 11, 2014) ("LNP Alliance *Ex parte* from December 11, 2014").

both of which have revenue in excess of a billion dollars per year. The CCA notes:

The LNPA selection process does not seem to have taken into account the interests of non-nationwide wireless carriers in matters such as vendor transition costs, support for Internet Protocol-based numbering systems, and several of the features and functions on which the business models of the competitive wireless carriers depend.... In particular, it does not appear that any analysis has been performed to determine the impact of an LNPA transition of smaller carriers, either in terms of financial effects, or in terms of consumer disruption.... These services are not addressed by the RFP or are addressed only cursorily, and may not be supported with hundreds of millions of dollars more in potential fees.⁵³

The secretiveness of the RFP process makes it difficult to determine the extent to which the CCA's fears might be realized. Moreover, there is no requirement in the RFP that transition costs be equal for carriers. The Commission should address these concerns and take other steps to ensure compliance with the Regulatory Flexibility Act.⁵⁴ The

⁵³ *Ex parte* filing of Competitive Carriers Association, CC Docket No. 95-116; WC Docket No. 07-149; WC Docket No. 09-109 (March 21, 2014) ("CCA *Ex parte* from March 21, 2014").

⁵⁴ See 5 U.S.C. §604 (a). See also Letter from Michael R. Romano, et al, of NTCA, WTA, RICA, and RBA, to Marlene H. Dortch, CC Docket No. 95-116, WC Docket

depth and breadth of concern within the industry are such that leaving these issues to the NANC threaten to undermine the Commission's credibility as well as the public interest in a forward-looking number portability system that promotes competition.

D. Hard to Remedy Broken Competitive Situation

Once damage is done to the competitive environment it is not easily remedied as there are few parties seeking to be new entrants in the telecom carrier market. The policies of the new LNPA may make it even harder for new entrants to emerge, and a new LNPA's lack of neutrality could yield further impediments to competition and market entry by smaller carriers. As a result, the Commission should carefully weigh any potential damage to the competitive environment and its remedy before approving a new long-term LNPA contract. In particular, the commission should consider the risks of new LNPA pricing models and the potential loss of important services to carriers operating in areas where competition is most needed but where it is most financially challenging to provide it.

Moreover, as mentioned previously, the role of the LNPA to facilitate competition by lowering consumer switching costs is, by its nature, in conflict with the goals of the large established carriers. Large carriers have a strong incentive to protect their customer base with higher switching costs for consumers.

Nos. 07-149 & 09-109 (March 3, 2015) (urging the FCC to conduct a Regulatory Flexibility Analysis evaluating the LNPA transition's effects on small businesses).

E. Commission Should Consider All Costs to Ecosystem

Contract cost is a tempting metric for the Commission to focus on, as it is tangible and readily available. According to Neustar's public financials, the contract amounts to approximately \$500 million per year, which is about \$0.75 per assigned US telephone number per year based on 2010 data.⁵⁵ But it would be a mistake to only consider these costs because the LNPA contract's cost to carriers is only one portion of the total costs to the communications ecosystem. Other costs include:

- 1) Transition costs and ongoing costs pushed to carriers and their impact on the competitive environment;
- 2) Costs to public safety and law enforcement agencies;
- 3) Risk to health and life;
- 4) Potential decline in competition and technological innovation.

These costs are difficult to measure, but that is not a legitimate reason for avoiding the effort. The potential cost savings on a cost-per-port basis are small relative to the competitive, public safety and innovation risks posed by a failed LNPA transition. Lower negative impact to the communications ecosystem is likely to offset any small contract cost savings. Economist Hal Singer estimates U.S. consumers have enjoyed savings of \$8 to \$10 billion since mobile number portability was implemented in 2004, "relative to a world in

⁵⁵ Based on 676,558,000 assigned phone numbers as of June 30, 2010. *See* Numbering Resource Utilization in the United States, published April 2013.

which U.S. porting times were equal to the average porting times in the sample (slightly over six days).⁵⁶ These consumer savings alone dwarf any potential savings possible from a lower priced LNP contract.

As discussed in Section II above, the Commission's mandate includes promotion of broad consumer availability at reasonable prices, as well as adequate facilities. Because customer payments support almost the entire communications ecosystem, the Commission must consider the cost of its decisions in this broader context.

VI. Potential Public Safety, Law Enforcement, and National Security Risks

Credible parties have commented on the risks to public safety, law enforcement and national security as a result of an LNPA change. A detailed analysis of these issues is beyond the scope of this report. However, they are important issues that should be considered in the context of a holistic clarification and analysis of the LNPA's future scope of work.

A. Future Services for Public Safety and Law Enforcement Agencies at Risk

Public safety agencies and providers including the Oklahoma PUC, NENA,

⁵⁶ Hal J. Singer, "The Consumer Benefits of Efficient Mobile-Number-Portability Administration," Navigant Economics (March 8, 2013). Available at: http://www.navigant.com/~media/WWW/Site/Insights/Economics/Consumer%20Benefits%20of%20Efficient%20MNP_Economics_030813.ashx.

Intrado, TCS, and the Illinois Emergency Management Association have raised concerns about the continued availability of 9-1-1 updates based on the NPAC/LNPA.⁵⁷ They are also concerned about the continued ability to port large batches of numbers that might otherwise be rendered inoperable due to damaged switches from events such as hurricanes and other disasters.⁵⁸ Public safety agencies are also concerned about the risks of a botched transition and its impact on services such as 9-1-1.⁵⁹

Law enforcement agencies access the NPAC database approximately 4 million times a year.⁶⁰ Law enforcement agencies including the FBI, the Secret Service, the NYPD, the International Association of the Chiefs of Police, the Drug Enforcement Administration, the National Sheriffs Association, and the US Immigration and Customs Enforcement Administration have all expressed concern about the need for specific services from the NPAC/LNPA.⁶¹ High on the list of these concerns is the ability of law enforcement agencies to continue to be able to track suspects whose phone numbers have been ported. The RFP indicates this service would be provided at the LNPA's discretion.

⁵⁷ LNP Alliance *Ex parte* from December 11, 2014

⁵⁸ See letter of Jonathon E. Monken, Director, Illinois Emergency Management to Marlene H. Dortch. WC Docket 09-109 (December 2, 2014).

⁵⁹ Comments of Intrado, CC Docket No. 95-116, WC Docket No. 09-109 (July 24, 2014).

⁶⁰ Ellen Nakashima, "Neustar, Telcordia battle over FCC contract to play traffic cop of phone calls, texts," Washington Post (August 9, 2014), available at: http://www.washingtonpost.com/world/national-security/neustar-telcordia-battle-over-fcc-contract-to-play-traffic-cop-for-phone-calls-texts/2014/08/09/778edea-1e7b-11e4-ae54-0cfe1f974f8a_story.html.

⁶¹ LNP Alliance *Ex parte* from December 11, 2014.

B. National Security Concerns

Several lawmakers have raised national security concerns about the potential LNPA switch.⁶² They are concerned about the risk that, for example, a foreign government might attempt to break into the database to uncover the parties the FBI and other national security agencies have under surveillance.

That Telcordia's parent company Ericsson is a Swedish company heightens security concerns among some senior lawmakers. Neustar commissioned the Chertoff Group,⁶³ a leading security services firm, to evaluate Telcordia's security plan. The resulting report indicated a number of weaknesses in the RFP. Critically, the Chertoff report also notes, "We do not believe the defects cited in this report can be remedied simply by post-award contract negotiation."⁶⁴ A detailed consideration of the relevant public safety, law enforcement and national security issues is beyond the scope of this report. However, credible entities and individuals have raised concern about risks of significant magnitude. This strongly suggests the Commission should

⁶² As but one example, the chairman and ranking member of the House Intelligence Committee, Rep. Mike Rogers (R-MI) and Rep. C.A. Dutch Ruppersberger (D-MD), urged the Commission to consult with national security agencies before finalizing a decision on the LNPA contract. Document available at: <http://www.fcc.gov/article/doc-329843a6>.

⁶³ The Chertoff Group's founder, Michael Chertoff was one of the report's authors. Mr. Chertoff was previously the Secretary of the U.S. Department of Homeland Security (2005-2009), a Judge on the U.S. Court of Appeals for the Third Circuit (2003-2005), and Assistant Attorney General of the United States (2001-2003).

⁶⁴ "A Review of Security Requirements for Local Number Portability," Chertoff Group (September 29, 2014) at 24.

fully explore and resolve these issues before finalizing the LNPA contract.⁶⁵

VII. Threats to the IP Transition and other Technological Advances

Section III.B above has already described stakeholder concerns about impacts on technological developments, particularly the competitive implications of the conflicting assumptions held by Telcordia and Neustar concerning whether the IP transition will occasion a transition to private, non-integrated and possibly separately-priced registries for IP number portability, or instead the continuation of a public, integrated registry through the NPAC. A broader and detailed discussion of the impact of the LNPA selection on emerging technologies and the IP transition is outside the scope of this analysis. Nevertheless, it's important to acknowledge that the potential conflict of interest with respect to developing or adopting new, potentially disruptive technology is obvious. Ericsson's largest customers are established telecom carriers that benefit from the status quo and typically dread market disruption, particularly from VoIP and other over-the-top ("OTT") alternatives. As such they are not likely to aggressively support new, potentially disruptive technologies that often yield the greatest consumer benefit.

A. Risk to the IP Transition is Significant

The IP transition process is an example of a technological shift, on the cusp of broad

⁶⁵ See *Ex Parte* filing of Neustar, Inc., CC Docket No. 95-116; WC Docket No. 09-109. (January 21, 2015).

adoption, that could provide significant value to consumers – but only if existing competition, consumer, and public safety protections are maintained and, ideally, strengthened. It represents a revolutionary change from the current TDM-based telephone technology and potentially expands consumer service options in the way OTT video is currently expanding the television market. The IP transition also resolves some remaining number portability limitations and could dramatically lower telecom voice pricing as well.

However, the IP transition -- because it may lower costs and barriers to entry -- is a risk to large established carriers and their infrastructure vendors, since each has a symbiotic self-interest in maintaining the status quo. As a result, a rapid IP transition generally runs counter to the interests of Ericsson, Telcordia's parent, and its largest customers. Credible parties, such as the LNP Alliance, opine that appointing Telcordia as the LNPA could risk the IP transition and the development of a competitive marketplace for new IP-based services by thwarting Neustar's work to support the IP transition in the NPAC as an integrated numbering system, and promoting instead the migration of IP numbering functions into private registries.⁶⁶

In general, small carriers have a concern that they will be shut out of private ENUM

⁶⁶ See, e.g., Reply Comments of the LNP Alliance, WC Docket No. 09-109; CC Docket No. 95-116 (August 21, 2014). See also Falvey and Malfara, "Why the FCC Should Extend Neustar's Contract by Two Years," *supra* note 30. For a more detailed analysis of the risks to the IP transition posed by a change in LNP vendors, see Comments of Neustar, Inc., PS Docket No. 14-174; GN Docket No. 13-5; RM-11358; WC Docket No 05-25; RM-10593; WC Docket No. 09-109; CC Docket No. 95-116 (Feb. 5, 2015).

registries. They may be shut out due to the cost and complexity of potentially needing to develop multiple interfaces to interface with each registry. Or they may be shut out by the access fees for accessing these registries – cost that would be outside the LNPA agreement and incremental to LNPA fees. For example, a larger group of carriers started development of the CC1 ENUM registry in the 1990s, but that group shrunk down to AT&T, Verizon and Sprint (who later dropped out as well). Those carriers awarded a contract to Telcordia for the CC1 ENUM registry that many smaller carriers felt was largely favorable to dominant carrier interests. As a result it attracted little interest from the rest of the industry.⁶⁷

A flawed IP transition could disproportionately harm smaller carriers because, as mentioned previously, they typically have fewer financial resources that could be used to manage difficult transition issues. In turn, this could harm consumers by depriving them of choice and further limiting competition. The complexity of the IP Transition due to changes in technology, service offerings and networks is massive. The Commission should ensure that critical competition, consumer protection, public safety/law enforcement/national security and universal service values are not compromised in the process. This will require the Commission to engage in a detailed assessment of each bidder's IP network plans and contingencies and related performance expectations.

⁶⁷ Based on a telephone conversation with Jerry James, consultant to the LNP Alliance on February 19, 2015. Mr. James indicated he was closely involved with these events in the 1990s and based his discussion on personal knowledge of events at the time.

B. LNP Geographical Constraints May Continue

A related example of a threat to technological innovation is that the LNP system still does not fully work for carriers who don't operate in all geographical regions,⁶⁸ putting them at a competitive disadvantage. These carriers would like the LNP system upgraded to solve this - something an upgraded NPAC platform that supported IP-based numbering could accommodate. Unfortunately, it appears that no plans to support nationwide number porting are on the horizon, which is not surprising since it is contrary to the interests of the largest carriers that dominate the NANC. The NANC's vendor selection process could have been an opportunity to correct this number portability disadvantage for smaller carriers, and yet the RFP failed to specify any particular requirements for supporting either nationwide porting or the IP transition. CCA, for example, has expressed these concerns, stating that "the RFP does not fully account for new and evolving services, including IP transition functionalities, which would free number porting from geographic constraints."⁶⁹

These examples suggest that an aversion to technological innovation that operate to promote competition or lower costs for small carriers constitute a serious risk for the LNPA transition. While an in-depth analysis of these technology issues is beyond the scope of this paper, we suggest they warrant detailed analysis and consideration by the Commission before finalizing the LNPA contract.

⁶⁸ See *supra* note 7.

⁶⁹ See CCA *Ex parte* from March 21, 2014.

VIII. Conclusion

The Commission should take this opportunity to directly confront the reality that the LNPA's suite of services has evolved into much more than a simple number porting service between telecom companies. The LNPA has become a significant player in a large but delicate ecosystem of telecom competition, public safety and technological evolution. Organizational systems or processes often evolve to create important, but unplanned dependencies as they become integrated into the larger ecosystem in which they operate. Frequently these dependencies are not obvious. Consequently, interrupting an organizational process can create severe unintended negative consequences. This may be the case in the potential transfer of the LNPA contract from Neustar to Telcordia – resulting from different terms and requirements for their respective services. The unanticipated consequences of this shift may impact industry competition, public safety and technical innovation – issues at the heart of the Commission's mandate.

Consequently, the Commission should consider a broader and more careful review of the scope of the role played by the LNPA, the LNPA contract itself, and the implications for competition policy, consumer welfare and public safety due to any change in services. The potential policy and social risks from not revisiting the LNPA contract are much greater than any savings from deferring to the dominant carriers and avoiding this opportunity to reassess the future role of the LNP system and of the LNPA specifically through a public notice and comment rulemaking.

IX. Exhibits

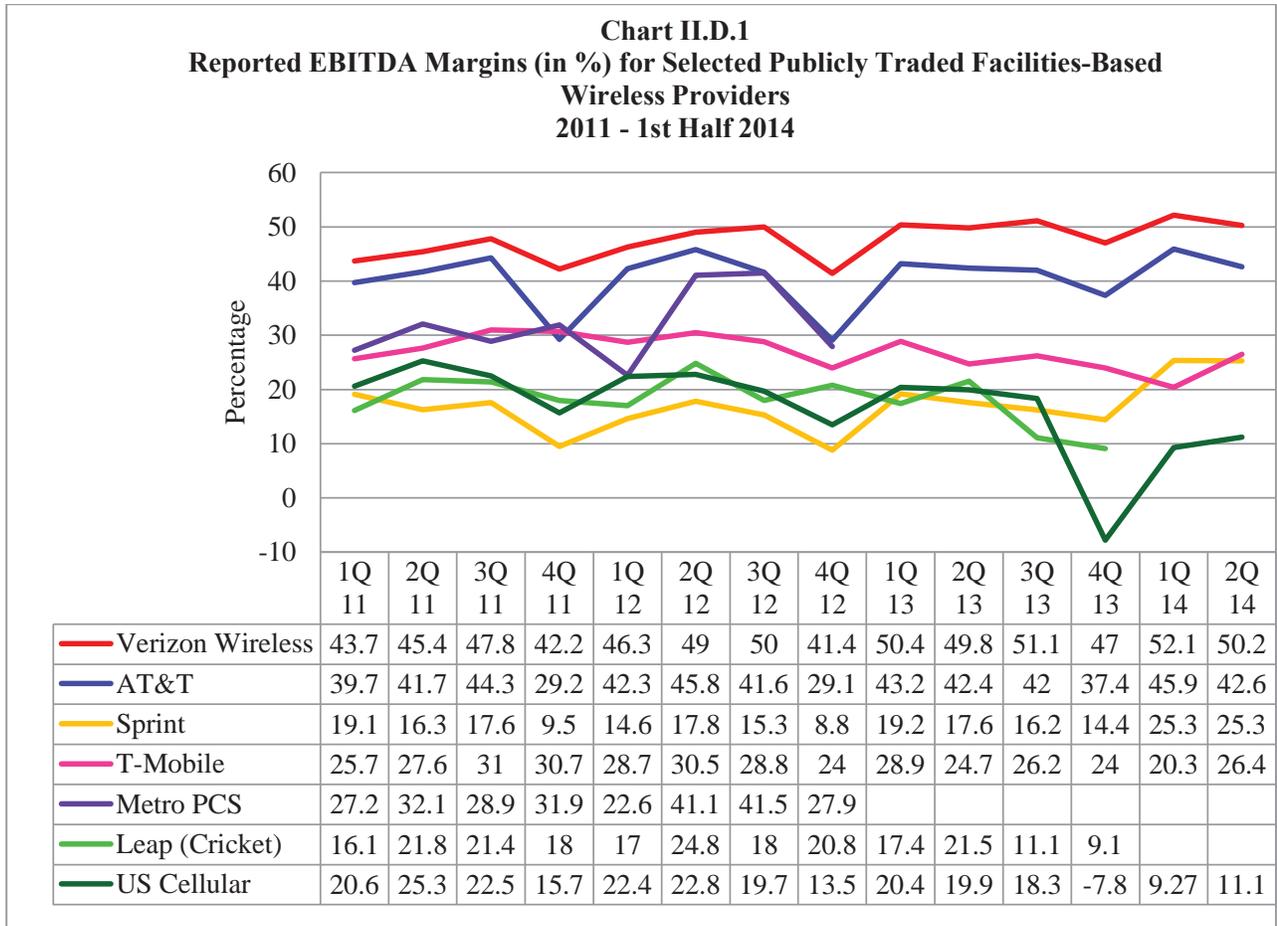
Exhibit 1: Market Shares for Publicly Traded Facilities-Based Mobile Wireless Providers Based on Service Revenue⁷⁰

Nationwide Service Providers	2011	2012	2013
Verizon Wireless	33.8%	34.4%	36.5%
AT&T	32.4%	32.0%	32.5%
Sprint	15.6%	15.7%	15.5%
T-Mobile	10.6%	9.3%	10.9%
Total National Service Provider Market Share	92.4%	91.5%	95.3%
Regional Service Providers	2011	2012	2013
US Cellular	2.3%	2.2%	1.9%
Metro PCS	2.5%	2.5%	
Leap Wireless	1.6%	1.6%	1.4%
NTELOS	0.2%	0.2%	0.2%
Cincinnati Bell	0.1%	0.1%	0.1%
Other	0.7%	1.9%	1.0%
Total Regional Service Provider Market Share	7.6%	8.5%	4.7%

Note: Data based on Table II.C.1, *infra*, UBS Wireless 411 Report. Version 51 2014 Q1, Table 31, pp.19 UBS Wireless 411 Report. Version 54 and CTIA total service revenue figures. For 2011, the data are also from the Sixteenth Competition Report Table 11 and 12.

⁷⁰ 17th Wireless Competition Report at ¶30.

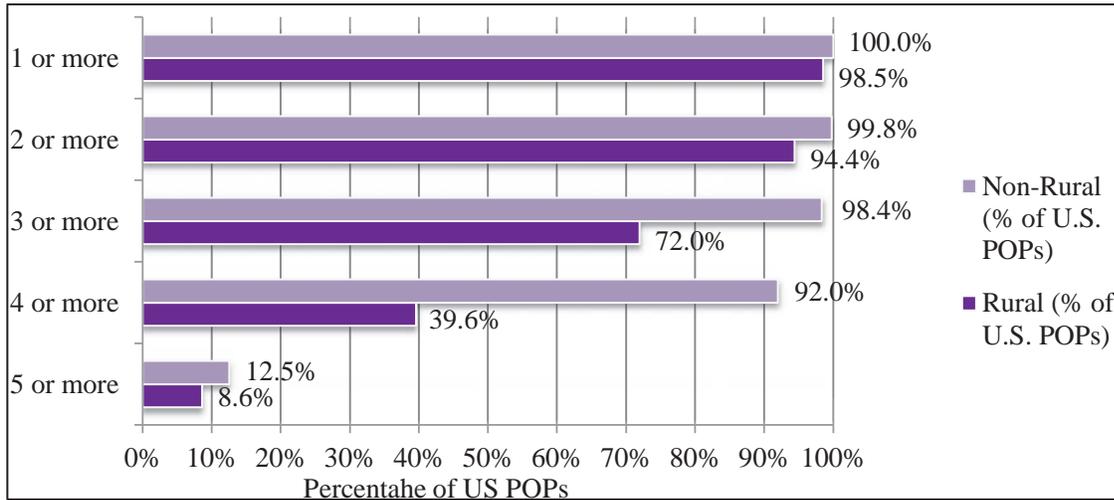
Exhibit 2: EBITDA Profitability of Largest Carriers is Highest⁷¹



Source: UBS Investment Research UBS Wireless 411 Version 51, Fig 46; UBS Wireless 411 Version 54.

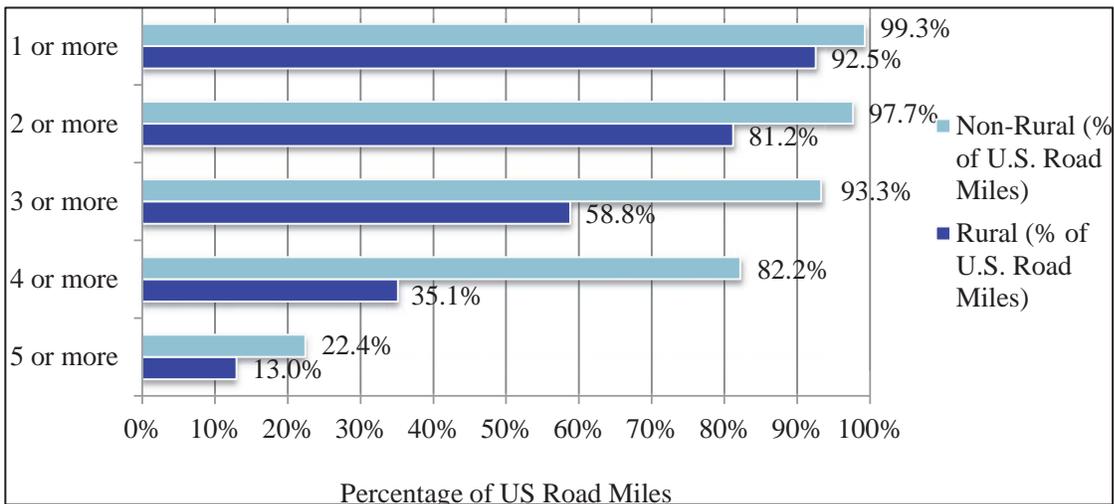
⁷¹ 17th Wireless Competition Report at ¶43.

Exhibit 3: Percentage of Population Living in a Census Block Covered by Mobile Wireless Broadband Providers in Rural vs. Non-Rural Areas, January 2014⁷²



Source: Based on January 2014 Mosaik Solutions and 2010 Census Data

Exhibit 4: Percentage of Road Miles Covered by Mobile Broadband Providers in Rural vs. Non-Rural Areas, January 2014⁷³



Source: Based on January 2014 Mosaik Solutions and 2010 Census Data

⁷² 17th Wireless Competition Report at ¶155.

⁷³ *Id.* at ¶154.

X. About the Authors

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Michael Calabrese directs the Wireless Future Project at New America's Open Technology Institute.⁷⁴ Mr. Calabrese focuses on developing policies that promote pervasive and affordable connectivity, including spectrum policy reform, mobile market competition, wireless broadband deployment and IT investment and innovation more broadly.

Mr. Calabrese currently serves as an appointed member of the U.S. Department of Commerce Spectrum Management Advisory Committee (CSMAC) since 2009. He also served as an invited expert on the President's Council of Advisors on Science and Technology (PCAST) spectrum reform working group during 2011-2012.

Mr. Calabrese has also served as vice president of New America (2003-2010) and previously as general counsel of the Congressional Joint Economic Committee, as director of Domestic Policy Programs at the Center for National Policy, and as pension and employee benefits counsel at the national AFL-CIO.

Mr. Calabrese is an attorney and graduate of Stanford Law and Business (JD/MBA), as well as Harvard College (BA). He speaks and writes frequently on issues related to spectrum, wireless broadband, and Internet policy. He has co-authored three books and opinion articles in *The New York Times*, *The Washington Post*, *The Atlantic Monthly*, *Slate* and other leading outlets.

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Mr. J. Armand Musey is a leading expert in the telecom, media and satellite sectors and a managing director at Goldin Associates, LLC.⁷⁵ Previously, he was the president and founder of Summit Ridge Group, a telecom, media and satellite focused valuation firm until it was acquired by Goldin Associates in 2014. Mr. Musey is a former top-ranked Wall Street research analyst and an investment banker and has been involved with a wide breadth of companies in the communications sector over the past 15 years. This background gives him a deep understanding of the complex web of relationships underlying the sector's competitive dynamics and associated financial and regulatory issues. Armand speaks at major industry conferences and is regularly quoted in the press as an expert in telecom, media and satellite financial and strategic issues.

Mr. Musey holds an MBA and a JD from Northwestern, an MA from Columbia and a BA from the University of Chicago. He is a member of the New York Bar and Federal Communications Bar Association. Armand is also a Chartered Financial Analyst (CFA) and a member of the New York Society of Securities Analysts where he chaired the Corporate Governance Committee from 2007-2009.

⁷⁴ For more information, please visit <http://newamerica.org/oti>

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