**Before the**

**Federal Communications Commission**

**Washington, D.C. 20554**

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In the Matter of )

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Nationwide Number Portability ) WC Docket 17-244

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Numbering Policies for Modern Communications ) WC Docket 13-97

)

Developing a Unified Intercarrier Compensation ) CC Docket 01-92

Regime )

)

COMMENTS OF INTERISLE CONSULTING GROUP

In many regards the technical issues surrounding nationwide number portability are the easy problems to solve. We support the general principle and recognize that a number of technical means have been proposed, from which a viable solution can be selected or synthesized. In particular, the National LRN approach appears to be the most straightforward, low-risk, cost-effective choice. The most difficult problems, however, are the ones summed up in a few sentences, and barely addressed in detail in the *Notice*:

We also seek comment on the various ways that NNP could affect carriers' pricing issues. How will proposed NNP implementations affect existing carrier tariffs? What are the ways in which various NNP proposals may alter the existing system of intercarrier compensation? Are there systems that can support or encourage a bill-and-keep system? [at 67]

Pricing is critical in a competitive industry that bills many tens of billions of dollars a year. While NNP is desirable, it cannot be implemented without changing the complex system of prices that drives the industry. That issue alone divides in several dimensions. It divides into wholesale (intercarrier) and retail. It divides into tariffs, contracts (including Interconnection Agreements), and non-tariff price lists. It divides into rating and routing. It divides into state and federal jurisdictions. The existing LNP system was designed in many ways to minimize the impact upon then-existing pricing schemes, which distinguished between local and toll calls, at a time when Bell Operating Companies were not yet allowed to carry interLATA traffic.

In 2011, the Commission released its 759-page *Report and Order and Further Notice of Proposed Rulemaking* in CC Docket 01-92, *Developing a Unified Intercarrier Compensation Regime[[1]](#footnote-1)*. While that Order began a process of reforming the obsolete intercarrier compensation system, it was never completed. Certain remaining issues have been noted in a “refresh” this year, particularly concerning the location of and charges for transport to points of interconnection, but these fall within the existing rate structure. There are many loose ends left unfinished. They certainly must be addressed before nationwide number portability proceeding can be completed.

## Retail pricing impacts must be clear

Retail telephone users must not be hurt by NNP. While it is likely that most wireline and almost all wireless customers subscribe to rate plans that price all domestic calls equally (usually at no charge, at least for some number of minutes/month), there are still many subscribers to traditional POTS plans that distinguish between “local” and “toll” destinations. If a number is ported out of a local area, callers must not be subject to unexpected toll charges for dialing what appears to be a local number.

Administratively, billing based upon the location of the subscriber, rather than the rate center of the number, would be very difficult as well, as the billing system would need to look up the actual location of the called number. This is not currently visible in the LNP database; an LRN today indicates LATA, not rate center, and some of the proposed plans use LRNs that do not even indicate that. Thus if actual location were to be used for retail *or* wholesale billing, an NNP database would need to list both the actual location of the number (such as LRN) *and* its current rate center. This would also need to be qualified by *when* the number ported, as calls before and after that date would need to be treated differently.

This is obviously an unwieldy solution and thus dictates that retail billing *not* be to the actual location of the called party. But this would also mean that people moving into a community or using a carrier without numbers in their actual community would only have a non-local number. This however is the lesser evil, something already dealt with by millions of mobile subscribers, and easier to fix, as will be noted below.

## Interconnection must still be regulated

Wholesale interconnection and its related compensation mechanisms are not a free and open market. Incumbent LECs still possess considerable market power. The PSTN is largely built around an obligation to carry all calls offered, with only rare, defined exceptions[[2]](#footnote-2). If the originating carrier must deliver the call to the terminating carrier, then the rate charged by the terminating carrier must be regulated or it will have incentive to engage in price gouging. Even within the existing rules, disputes still arise. We take note, for example, of the issues recently reported in the refresh by Peerless and others who were denied direct connection to T-Mobile and required to pay a fee to a third party tandem provider[[3]](#footnote-3). We also note a history of issues with rural call completion.

Nor is bill-and-keep per se necessarily a simple answer. The type and location of interconnection impacts cost. CLECs are still denied IP-based interconnection by major ILECs. They are required to add media gateways. The Commission no longer requires carriers to even make Special Access TDM transport available, though Switched Access Transport is still available at grotesquely contributory rates based on 1992 norms, on which price caps were based. The number and location of interconnection points impacts transport charges. We do not purport to have the entire answer to unified intercarrier compensation, but recognize that many elements that must be addressed before nationwide number portability can move ahead.

## Calls are still categorized for intercarrier purposes

The 2011 Order did not do away with the rather baroque system of call categorization that developed over the previous decades. Rather, it maintained the system intact but reduced *terminating switched access minute of use* rates to eventually align with *terminating intercarrier compensation*. Yet it left the distinctions alive. Thus it is still necessary for PSTN providers to categorize calls, for intercarrier purposes, into one of these categories:

* Local wireline
* Local ISP-bound
* Virtual FX
* Intrastate non-local wireline (interLATA and intraLATA)
* Interstate non-local wireline (interLATA and intraLATA)
* Intra-MTA wireless
* Inter-MTA wireless
* VoIP local
* VoIP non-local
* Stimulated access

Calls are further subject to originating and terminating rates that are different by category, and a mix of end office and tandem rates. The *CAF Order* also did not address originating access, and did not fully address transport charges. In many cases categorization is based on rate center assignments of the telephone numbers at either end of the call. For NNP to succeed, or at least to not cause chaos, a truly *unified* system of intercarrier compensation is thus required.

One key distinction between reciprocal compensation (between Local Exchange Carriers for “local” calls) and switched access (calls not “local”) is the way originating charges are levied. Switched access is based on a largely-obsolete model of independent interexchange carriers who have a direct business relationship with the end user and which in turn purchase both originating and terminating access from the LECs at both ends of the call. Because IXCs were expected, under the *WATS and MTS Order* rules that created the access charge system in 1984, to make above-cost *contributory* (vs. at-cost *compensatory*) payments to LECs, these charges were a substantial share of the price of the call itself. These rates declined over the years but did not fall below 1c/minute (for the lowest-cost carriers) until the *CALLS* plan was enacted around the turn of the century.

Indeed it may well have been originating access charges that drove much of the demand for UNE-Platform in the early years after the Telecom Act created it. An IXC that converted its subscriber from an ILEC subscriber with IXC service to a Platform customer of the IXC’s CLEC affiliate would now be paying itself (that is, not paying) the originating access charge, not paying the ILEC. Originating access charges provided a benefit for all LECs who offered “any distance” plans, wherein they acted as the IXC of record and resold third-party IXC services as their own, taking originating access out of the equation.

Yet originating access tariffs remain on the books, and their primary role today is a pernicious one, which is fully *incompatible* with NNP: Originating access is still charged to foreign exchange (FX) lines, which includes lines ported out of their own rate center. That is, if a telephone number is assigned to a subscriber who is not *physically* located within the exchange area of the NPA-NXX code, then calls *to* that number from subscribers who see it as local are in fact charged as originating access to the serving carrier, typically a CLEC. Commission policy only applies this originating access to *interstate* FX lines, but in most states it is now applied locally as well. For example, if a Newton, Massachusetts telephone number is configured to ring into a Cambridge, Massachusetts location five miles away, the LEC who *receives* the call from a Verizon subscriber is charged originating access on *all* calls. This is not a requirement of tariffs, but was written into most Interconnection Agreements in the 2000-2002 era, in reaction to the widespread use of so-called Virtual NXX (essentially the same as FX, since CLEC switches cover a larger area than traditional ILEC switches) by CLECs supporting dial-up ISPs. The Commission then reduced reciprocal compensation on local ISP-bound calls to $0.0007 (or in some cases bill and keep), but if the modem pool itself were not in the local calling area, then the carrier could be charged intrastate originating access. In one well-known case, a CLEC[[4]](#footnote-4) was put out of business with tens of millions of dollars in such “debt” owed to the ILEC that had formerly paid it reciprocal compensation for the very same calls before state regulators adopted the ILEC position on Virtual NXX. The *CAF Order* did not rule on Virtual NXX, leaving it with the states.

The same rules do not apply to mobile calls. If either end of a call is mobile, then it is “local” if both ends are within the same Major Trading Area. This rule was put into place at a time when mobile phones were a small fraction of the total, so giving them an advantage in intercarrier compensation was a way to give the young industry a small boost. But today mobile minutes outnumber wireline minutes. The rule thus becomes a penalty to wireline carriers. Of course the exact location of mobile callers is not always known, and is not implied by their NPA-NXX. Thus mobile carriers must perform a Percentage of Local User (PLU) study periodically, and then prorate their total minutes between local, which is subject to bill and keep, and terminating access. The net result is a very low blended MOU rate.

VoIP calls too are subject to different rules. They are exempt from the originating access charges levied on FX lines, though the *CAF Order* clarified that they do pay terminating access[[5]](#footnote-5). Thus a subscriber moving from one town to the next has an incentive to shed one’s established PSTN carrier and move to a VoIP service simply to be able to keep the same telephone number. This is irrational. Perhaps as a result of this rate disparity, many cable companies and other carriers will not allow a customer to port a number to a nearby rate center *even when it is served by the same switch with the same LRN* and thus would be routed identically. That would constitute FX (or Virtual NXX) and could provoke retaliatory billing of originating access by the ILEC under terms of the typical Interconnection Agreement. If this trivial degree of semi-local number portability, which requires *no* changes to the network itself, is impeded by current intercarrier compensation rules, then nationwide number portability would be even more difficult.

For the same reason, Feature Group A (FGA) as a tariff concept should be abolished, and such circuits should be reclassified as Local Exchange Service. Feature Group A was the original ENFIA, ordinary telephone lines used to transport long-distance calls (“line-side access”). FGA was created in order to allow the LECs at either end of the call to extract the contribution from long-distance rates that would otherwise be lost. Without a need to classify calls, FGA is no longer required. This too would remove a potential area of conflict between carriers, and between carriers and customers. We also recall that the “modem tax” kerfuffle of 1987-1988 was based around whether or not enhanced-service (predecessor of ISP) access circuits should be treated as local exchange or FGA.

## Rate centers themselves are obsolete

The obvious fix to this set of problems is to recognize that the PSTN, like the Internet[[6]](#footnote-6), is no longer divided along strict boundaries of local and long distance. Telephone numbers are entries in a database, and thus are *names*, not addresses; the address today includes the LRN. Long-distance voice transmission itself is inexpensive; 64 kbps calls consume a miniscule share of the bandwidth of a modern fiber optic pipe. Postalized calling plans are common on wireline and the norm on mobile services: Callers no longer care as much about local vs. long distance, and the subsidies that once flowed from the latter to the former are largely history. It is time to put the final nail in that coffin by simply abolishing the concept of rate center altogether.

Without rate centers, wholesale and retail rates can each be truly unified into a simple, nationwide scheme. Callers could dial any domestic number at the same price, and carriers would not have to go through complex classification schemes to determine the correct CABS[[7]](#footnote-7) rate. Intercarrier compensation could be based exclusively on the cost of services provided to the other carrier, regardless of the *originating* location or category of the call.

Carriers should still be able to request prefix codes within a Numbering Plan Area corresponding to where their customers are, as many customer will no doubt prefer a number that appears to be at least approximately local. Thus a Massachusetts LEC should be able to request new numbers in the Massachusetts NPA (or at least NPA-overlay group) that corresponds to where its customers are, and assign them to its customers on demand. But these need only be to the NPA level. A carrier would not need separate NXX codes or thousands-blocks for each rate center, just a single pool of numbers per NPA. This would also extend the life of the Numbering Plan.

A minor consequence of such a change is that carriers would lose the remaining retail revenues currently associated with non-local domestic calls. But customers with high volumes of non-local calls have largely switched to flat-rate plans already. Retail plans that charge tolls are generally offered at a lower monthly price than flat-rated plans. This is a legacy of non-cost-based pricing associated with earlier notions of universal service delivered via wireline. “Long distance” was once a luxury, so it was priced as such. Bottom-priced plans can be recreated in different ways. One is to follow the model of the wireless industry and offer limited buckets of minutes. For instance, instead of flat-rate local-only calling, a plan might offer 300 minutes/month of domestic calling and charge 3c/minute beyond that.

A truly competitive market arrives at prices that mirror costs. If intercarrier compensation is rationalized, then domestic costs will not vary much by called party location, and a cost-based plan will not make the same distinctions as legacy plans do. We also note that the lowest-cost plans for many users are wireless, that Lifeline has largely moved to wireless plans, and thus legacy local-only wireline plans are rarely needed at the entry level.

A second issue with abolishing rate centers and toll calling is the impact on rural carriers whose current revenues are disproportionately dependent upon switched access charges. This issue has come up in the past, including in the 2011 *CAF Order*, and similar solutions exist, mainly to adjust non-traffic-sensitive elements of the High Cost Fund, such as the CAF Intercarrier Compensation fund, to compensate. (The Commission is well equipped to work out the details.) Rate of Return Carriers and small high-cost Price Cap Carriers represent only a small share of the total, and that long tail of high-cost carriers should no longer wag the whole PSTN dog.

## Reciprocal compensation should be the sole model of intercarrier compensation

While the *CAF Order* essentially redefined switched access as a special case of reciprocal compensation, it left the pre-1996 rate structure in place while adjusting its rates. Thus calls must be classified as local or toll before the rate can be computed. Absent rate centers, all domestic calls are local. Thus all calls are subject to reciprocal compensation, and should be subject to rates consistent with Sections 251(b)(5) and 252(d)(2) of the Communications Act, as amended by the Telecom Act of 1996.

The main distinction applies today at the originating end: Reciprocal compensation is always paid forward, while switched access includes an originating access charge paid to the LEC. Abolishing originating access as a rate element removes this, and allows a single reciprocal compensation rate structure to apply.

## Transport costs are still variable

Intercarrier compensation necessarily consists of both termination and transport. While most efforts to date have addressed termination charges, and as we have noted *originating access* charges should be abolished, transport remains an issue, especially outside of the major metropolitan areas. In a postalized network with national number portability, transport may ironically become even more complex.

Current rules are structurally rational even if not priced correctly. But they still reflect two different pricing philosophies, because they were adopted at different times for different purposes. *Switched access* tariffs include multiple elements, albeit some of which have been zeroed out. These include (non-exhaustively) explicit prices for tandem switching, tandem switch ports, switched transport mileage between the tandem and end office, unswitched transport mileage to the access carrier, and end office switching. Thus a call handed off to the end office carries fewer rate elements and a lower charge than one handed off to a tandem.

Reciprocal compensation rates, based on Section 251, have typically been simpler, even before the reductions from the *CAF Order*. Typically they were either uniform per minute, or had tandem and end-office per-minute rates. A CLEC whose coverage area was similar to a tandem’s was, by the rules[[8]](#footnote-8), entitled to get the tandem rate, but many ICAs simply ignore this and pay CLECs the end office rate while charging the tandem rate to calls that were not delivered to the end office.[[9]](#footnote-9) If the CLEC used ILEC facilities to reach the end office, then it would be charged the high Special Access rate. (It is not clear if ILECs are still even obligated to make such facilities available, as Special Access was removed as a mandatory service in 2017’s *BDS Order*.[[10]](#footnote-10)) No mileage elements were typically applied beyond the Point of Interconnection.

Calls should simply be billed reciprocal compensation, for transport and termination, based only upon the location of the handoff *to* the terminating carrier and the location of the terminating line’s LRN. LATA distinctions themselves are obsolete, but call delivery areas do remain a useful concept: Carriers need not hand off calls to the terminating switch directly, but should have accessible handoff points (network edges) for each destination, with a first-choice point carrying the lowest rate (similar to today’s “end office” rate, and typically bill and keep) and additional points carrying bundled cost-based transport charges (similar to today’s “tandem” rate). This is laid out in more detail below.

### The Internet is not the right model for the PSTN

The Internet itself represents an entirely different paradigm, one in which packets themselves are delivered atomically, as IP is itself connectionless, and in which routing is not necessarily reciprocal (i.e., packets between two points need not follow the same path in both directions.) Among national providers, a common arrangement is called *hot potato routing*: Packets are handed off to the terminating network at the first possible opportunity. However all such arrangements are contractual and private, as the Internet is not common carriage and its practices do not need to compensate for advantages of incumbency or size. The PSTN itself is typically “cold potato” and connections are bidirectional. Whatever model applies to a given PSTN call should be based on actual costs, not artificial barriers.

### Most “VoIP” is really PSTN traffic that is not on the Internet

While Internet VoIP traffic (e.g., Skype, Vonage, Ooma) is transported the same as any other Internet traffic, a majority of voice traffic encapsulated using IP is *not* sent across the Internet, and is instead handled privately. (We prefer to refer to this as Voice *using* IP, VuIP, vs. Voice over IP, VoIP, as the IP in this case is *within* the carrier network, not a third-party ISP that voice is carried *over*. Examples of VuIP include PacketCable, FiOS, and U-Verse.) A VuIP arrangement can have quality of service, such as lossless transmission and controlled latency, not possible over the public Internet. Such handoffs of calls, then, are typically performed on a regional basis, reciprocally routed; essentially the Session Border Controller used in these arrangements is more or less a form of tandem switch. Transport to and from such points of interconnection is the business of each carrier, and bill and keep arrangements are common, though not mandatory. These voluntary arrangements should be allowed to continue, but mandatory interconnection points need to be established as well, especially to permit smaller, local carriers to interconnect with larger ones.

### Primary and secondary points

A useful approach is to extend one of the reciprocal compensation models to all calls not otherwise subject to bilateral agreements. But the “end office” vs. “tandem” distinction is technology-sensitive. A more generalized approach to defining network edges is to say that for every LRN, geographic or not, there should be at least one “primary point of interconnection” (PPOI). Bill and keep would apply to all calls delivered to that point, whether in TDM or IP format. Carriers with a large footprint should also establish secondary points of interconnection (SPOIs). These would carry a per-minute charge for transport. In the existing PSTN, end offices (hosts, but not remotes) would all qualify as PPOIs, though this could change with NNP; tandems would qualify as SPOIs. A terminating carrier should not be allowed to charge transport to carriers who are willing to meet it at a designated PPOI.

All network edges should be in readily accessible locations, which could include major data centers or major ILEC buildings. An incumbent LEC should be required to retain a PPOI in each metropolitan area or similar region that it serves. A LATA is one such area, but inasmuch as those were created for the MFJ and technically represent no-longer-operational limits on an RBOC’s local services, LATA *per se* is not necessarily the appropriate term to use, or necessarily the specific boundaries. An ILEC’s wire centers should remain available as SPOIs. Transport charges between a PPOI and SPOI should be regulated and cost-based, as there is not necessarily a market for such services in all areas. To the extent that an ILEC provides service to a local area, a CLEC or CMRS carrier should be able to access a PPOI in that area, regardless of the directory numbers assigned; a CLEC or CMRS carrier in a rural area, for example, should not be required to purchase transport to a remote city in order to interchange local traffic, nor should a rural ILEC. A CLEC in turn may establish its PPOI at its own facility, or at a carrier facility in the areas it serves; these correspond to existing Points of Interconnection. A CLEC may also establish SPOIs, charging a transport rate at approximate parity with the ILEC.

## Conclusion

This proceeding provides an opportunity to complete the unfinished business of CC Docket 01-92 and create a unified system of intercarrier compensation. In fact, it creates a necessity to do so. The technology exists to provide nationwide number portability. Financial arrangements dating back to the 1920s and revised in the 1980s should not stand in the way, but if they are not addressed, they could create chaos.

1. *FCC 11-161*. Since this Order also introduced the Connect America Fund, it is most often referred to as the *CAF Order*. [↑](#footnote-ref-1)
2. These exceptions include those recently enacted concerning robocalls and spoofed caller ID. [↑](#footnote-ref-2)
3. 2017-12-04 Ex Parte Notice of Consolidated, Peerless, and West, WC Docket Nos. 10-90 & 07-135, CC Docket No. 01-92. [↑](#footnote-ref-3)
4. Global NAPs. Its New England data center was in Quincy, MA and had modems answering calls from numbers local to all rate centers in several LATAs. [↑](#footnote-ref-4)
5. Even then, the VoIP providers had a short-term advantage, as they were only charged the *interstate* access rate; in most states this was lower than the *intrastate* rate until the latter was brought into parity over a three-year period. [↑](#footnote-ref-5)
6. We do *not* consider the Internet to be a “public switched network” itself. Rather, we simply point out that it does not have distance-related charges or, for that matter, a reliable means of determining distance. The lack of long distance charges on the Internet no doubt contributed to the early growth of Internet-based voice services, which in turn put pressure on long distance telephone rates. [↑](#footnote-ref-6)
7. Carrier Access Billing System, the traditional method of wholesale billing for non-local calls. [↑](#footnote-ref-7)
8. 47 C.F.R. 51.711(c)(3). “Where the switch of a carrier other than an incumbent LEC serves a geographic area comparable to the area served by the incumbent LEC's tandem switch, the appropriate rate for the carrier other than an incumbent LEC is the incumbent LEC's tandem interconnection rate.” [↑](#footnote-ref-8)
9. “… it being understood and agreed that Verizon shall charge (and \*\*\*CLEC Acronym TE\*\*\* shall pay Verizon) the End Office Reciprocal Compensation rate set forth in the Pricing Attachment for Reciprocal Compensation Traffic \*\*\*CLEC Acronym TE\*\*\* physically delivers to a POI at the Verizon Interconnection Wire Center in which the terminating Verizon End Office is located, and otherwise that Verizon shall charge (\*\*\*CLEC Acronym TE\*\*\* shall pay Verizon) the Tandem Reciprocal Compensation rate set forth in the Pricing Attachment for Reciprocal Compensation Traffic \*\*\*CLEC Acronym TE\*\*\* delivers to Verizon; it also being understood and agreed that \*\*\*CLEC Acronym TE\*\*\* shall charge (and Verizon shall pay \*\*\*CLEC Acronym TE\*\*\*) the End Office Reciprocal Compensation rate set forth in the Pricing Attachment for Reciprocal Compensation Traffic Verizon delivers to \*\*\*CLEC Acronym TE\*\*\*. From boilerplate *Verizon Comprehensive Agreement-v3.5-082216.doc* [↑](#footnote-ref-9)
10. FCC 17-43, Report and Order in WC Docket 16-143, *Business Data Services in an Internet Protocol Environment* et al. [↑](#footnote-ref-10)