

The advantages of the LRN solution are significant, and it achieves every objective that a permanent number portability solution should achieve. First, LRN does not require calls to be routed first to the incumbent exchange carrier's network. It thus allows alternative carriers to design and engineer their networks with maximum efficiency, and does not adversely affect network reliability, transmission quality, or transport cost for alternative carriers.

Second, the LRN proposal is especially effective in conserving numbering resources. The LRN proposal is a "single number" solution. This means that the customer is identified in the serving switch by a single number, dialed by the calling party to reach that subscriber, eliminating the need to provide a unique, customer-specific network address to effect call routing. Multiple telephone numbers -- indeed, all customer numbers served by an end office -- are associated with one network address. LRN will thus optimize the future availability of numbering resources. Moreover, LRN will enhance the current use of numbering resources by allowing "stranded" or unused

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a query has been performed and that the call should be processed and routed based on current routing procedures.

telephone numbers to be recovered and re-used by competing carriers.<sup>26</sup>

Third, the LRN proposal supports the continued availability of vertical features and advanced services for customers of all exchange carriers. Because the signaling used in LRN preserves and passes to each carrier the Location Routing Number network address, the original dialed number, and the original calling number, advanced features based on calling party number may be offered to both calling and called parties. Moreover, LRN can support additional operator service functions, such as busy line verification, emergency interrupt, and Line Information Database ("LIDB") access for calls requiring alternative billing.<sup>27</sup>

In addition to meeting these fundamental criteria, LRN offers additional advantages. LRN uses the existing 10-digit North American Numbering Plan format, as well as six-digit routing and thus may be implemented without changes to existing routing algorithms in network switches. Moreover, because the Location Routing Number uniquely identifies the

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<sup>26</sup> This is because, under LRN, telephone numbers with the same NPA-NXX can be assigned to end offices of different carriers.

<sup>27</sup> With certain call processing changes, these features could be made available by using LRN as a "pointer" to the operator service position serving the "ported" customer.

end office where the call must be terminated, any network switch, including a tandem, is capable of routing the call to the appropriate terminating switch of the serving local exchange carrier.

LRN is also desirable because it permits call processing to be performed by the next-to-last ("N-1") carrier. In the case of an interexchange or intraLATA toll call, this means that the originating local exchange carrier will pass the call to the appropriate toll carrier, which will perform a signaling query to the routing database of its choice to determine the network address and local exchange carrier to which the call should be terminated. By permitting an intermediate carrier to determine how and where to route and terminate the call, the N-1 call processing scenario eliminates the need for a portability solution to be implemented simultaneously on a nationwide basis for traditional exchange services,<sup>28</sup> allows portability to be rolled out on a region-by-region basis.

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<sup>28</sup> Special issues may be raised for wireless carriers seeking to support seamless nationwide roaming. All such carriers would be required to modify their current systems and procedures to translate on some basis other than the first six digits of the Mobile Identification Number ("MIN") in order to identify the correct Home Location Register for "roaming" customers. This required identification will be in addition to the need to identify the correct terminating location of calls made by the roaming subscriber.

Contrary to the Commission's suggestion (para. 47), N-1 is a highly efficient call processing flow that will facilitate the implementation of number portability. In addition to the fact that the N-1 call flow does not require a simultaneous, nationwide "flash-cut" to number portability, that call flow also would avoid placing incumbent exchange carriers in the an unwarranted position of always performing, and imposing charges for, database queries on all calls originated by their customers to customers of alternative carriers.

It is also clear that the N-1 call flow is superior to terminating access provider ("TAP") systems. It is virtually certain that, at the outset of local exchange competition tests, customers of incumbent carriers will still originate the vast majority of these calls. Call processing relying on the TAP approach, replicates the routing inefficiencies of RCF by requiring that calls pass through the networks of customers' former service providers. Further, as the Commission notes (para. 44), the TAP approach relies on existing NXX code assignments, and thus would require new entrants to rely on incumbents to perform database queries, and thus collect charges, on almost all calls.

III. NO OTHER PROPOSALS OFFER AN ACCEPTABLE PERMANENT  
NUMBER PORTABILITY SOLUTION, ALTHOUGH ONE PROPOSAL  
OFFERS AN ACCEPTABLE INTERIM APPROACH

The Commission has solicited comment (paras. 38, 39), on two other permanent number portability proposals, the Stratus/US Intelco proposal and the GTE proposal. Neither of these alternatives satisfies the requirements of a permanent number portability solution. The Commission has also solicited comment (para. 36) on a third proposal, by MCI Metro, which has the potential to provide short-term relief from the competitive disadvantages imposed by the current interim portability arrangements, and which should thus be adopted for that purpose, absent a compelling alternative.

A. The Stratus Computer/US Intelco Proposal

As the Commission notes (para. 38), the Stratus/US Intelco ("Stratus") proposal uses a "dual number" approach to de-couple the dialed number (customer telephone number) from the number (network address) used to route and terminate a call to that number. Thus, under the Stratus proposal, each customer location is assigned a ten-digit customer number address ("CNA"), which is mapped to a unique ten-digit network node address ("NNA"), each of which is stored in a routing database. The NNA identifies both the terminating end office and the line or trunk to which the call should be terminated. The CNA serves as the number to

be dialed to reach the subscriber. Because CNAs are not dependent upon NNAs, the same CNA may be "re-associated" from one serving end office (i.e., NNA") to another, allowing the customer to "port" his number.

Under the Stratus proposal, a carrier seeking to route a call to a "ported" number will receive the dialed number (CNA) and launch a query to a number portability database chosen by that carrier.<sup>29</sup> The number portability database will translate the dialed number from its CNA to its associated NNA, and return the NNA to the querying switch in the carrier's network. The querying carrier will route the call and pass the NNA to the serving end office, which will use the NNA to terminate the call to the appropriate subscriber line.<sup>30</sup>

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<sup>29</sup> This query may be made either by a local exchange carrier or an interexchange carrier, depending on the nature of the call. On a local call in a fully developed Stratus environment, the originating local exchange carrier will generally launch this query. In the case of a toll call, this query will be made by the toll service provider carrying the call.

<sup>30</sup> More specifically, the call processing flow might take the following form: on a call to "ported" number 206-555-1234, the carrier seeking to route the call will launch a query to the number portability database based on a AIN trigger. The database will inspect the CdPN parameter in the SS-7 signaling message, translate it to its corresponding NNA value (in this example 206-555-9867), populate the CdPN parameter with the NNA, and return this signaling message to the querying carrier's network. The querying carrier will then route the call based on the NNA and pass this number to the end office of the terminating carrier.

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The Stratus proposal does not achieve the objectives of a permanent number portability solution. First, the Stratus proposal would place significant pressure on numbering resources. Under this proposal, each subscriber must be assigned two unique addresses, each address using ten digits. This "dual number" approach would deplete available numbers far too quickly.

Second, the ability of the Stratus proposal to support advanced services and features is questionable. Because subscribers are identified in their end offices by the network addresses, in a typical call flow, SS-7 signaling will deliver the originating NNA, but not the originating CNA, to the terminating carrier. Thus, without additional queries or cumbersome "workarounds," the provision of the original calling number -- and Caller Identification -- to the called party would not appear possible. Other calling party number features would also appear to be unavailable.

Third, the use of both an NNA and CNA to designate a subscriber line may present practical problems for many existing service arrangements and may present significant administrative and billing problems. On calls to private branch exchanges, for example, serving end offices currently

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outpulse a variable number of the CNA digits to the PBXs to designate subscriber lines; without special measures, the CNA will not be available for outpulsing under the Stratus proposal. In addition, operations support systems and switches would have to be modified to recognize and distinguish between NNAs and CNAs, and may be unable to perform their functions that depend on interaction between customer and network functions (e.g., customer trouble reporting).

B. The GTE Proposal

The GTE proposal offers portability by assigning a non-geographic number, which may be mapped to any geographic number, to customers who wish to "port" their telephone numbers. Customers who obtain a "portable" number could then use this number to "port" from or to any local exchange carrier.

There are several apparent shortcomings to the GTE proposal. Among other things, it will place significant strain on numbering resources by requiring all "ported" customers to select one of a limited number of non-geographic numbers. It further will force all "ported" customers to relinquish the geographic significance of their numbers. It will also require a nationwide "flash-cut" to portability so that "ported" numbers can be recognized and properly routed.

More fundamentally, GTE's proposal requires that customers choosing alternative service providers select a new telephone number; this is the very requirement that a permanent number portability solution should eliminate. This disadvantage is amplified by the fact that the new "portability" number must be in a form quite different from that traditionally used by subscribers for basic exchange services. Due to these fundamental deficiencies, the Commission should not seriously consider the GTE proposal as a permanent or interim number portability solution.

C. The MCI Metro Proposal

The MCI Metro proposal is based on the assignment of a unique three-digit Carrier Portability Code ("CPC") to each local exchange carrier within a Numbering Plan Area ("NPA").<sup>31</sup> The CPC for each local exchange carrier will be distinct from the NPA, and will be stored along with telephone numbers of "ported" customers in a number portability database for a designated region.

Under the CPC proposal, a carrier seeking to terminate a call to a "ported" customer will launch a query

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<sup>31</sup> Under this proposal, the assigned CPC could be any three digits between 200-999, excluding Service Access Codes, N11, and valid or reserved NPAS. In the 212 NPA, for example, local service provider "A" might be assigned "345" as its CPC, local exchange carrier "B" might be assigned "678" as its CPC, and local exchange carrier "C" might be assigned "987" as its CPC.

to the number portability database. The number portability database will return the query with the customer's seven digit telephone number, but will replace the NPA with the CPC of the exchange carrier serving the customer.<sup>32</sup> The querying carrier will then route the call to a location pre-designated by the terminating carrier, using six-digit translation based on the CPC and NXX of the translated number.<sup>33</sup>

The CPC proposal has certain important limitations that make it unsuitable as a permanent number portability solution. Under CPC, calls would be routed to the terminating local exchange carrier at a specific, pre-designated location. This could produce significant routing inefficiencies, as calls generally would not be routed directly to the end office serving the "ported" customer, and would require additional transport from the pre-designated "drop" to the serving end office.

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<sup>32</sup> For example, on a call to a "ported" customer with the telephone number "212-555-2198" served by exchange carrier "1" in the 212 NPA, the dialed number would be translated from "212-555-2198" to "345-555-2198."

<sup>33</sup> The same type of query would be made on a call to a "non-ported" customer. In such a case, however, the portability database would return the "default" CPC for the NPA-NXX, which would be the CPC of the incumbent exchange carrier. The querying carrier would then route the call using six-digit routing.

Further, and perhaps more significant, the three-digit CPC format will inevitably place pressure on numbering resources. This is true because CPC requires significant numbers of CPC codes. In a territory comprised of 4 area codes, for example, where three wireline exchange carriers choose to provide service, the CPC proposal would require 12 CPC codes.<sup>34</sup> It has been proposed that CPCs would be assigned from the block of 80 NPA codes reserved to support the future expansion of the North American Numbering Plan. However, the use of the CPC proposal in a number of large metropolitan areas could consume these codes relatively quickly and compel code reuse; if codes were exhausted in this way, the same CPC code would need to be assigned to different carriers in different area codes. Moreover, over a long period of time, further code exhaustion might make it necessary to designate codes as both CPCs and NPAs, imposing additional requirements on all carrier networks.<sup>35</sup> It is generally agreed that this type of re-use would not be acceptable to the industry.

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<sup>34</sup> Indeed, this scenario becomes even more problematic if two cellular (A- and B- block) and two PCS licensees also choose to provide service within this service area.

<sup>35</sup> If codes are used as both CPCs and NPAs, networks would be required to discriminate between a code that was part of a number dialed by an end user representing an NPA, and the same code returned as part of a number from a database representing a given carrier in a different NPA.

Nonetheless, as a near-term database solution, CPC promotes competition to a much greater degree than current "interim" portability arrangements such as RCF, and would serve well as a transitional "bridge" to a permanent number portability solution. First, unlike current arrangements, CPC supports queries by the N-1 carrier, and thus does not require that calls be routed through the incumbent's network. In addition, CPC allows individual carriers to own or provide for their own routing databases, thus permitting them to control many of their number portability costs and engineering decisions. Further, unlike current arrangements, CPC allows for many vertical features to be offered to all local exchange customers. Perhaps most important, because CPC relies on existing standards and capabilities, CPC may be implemented by early 1996, providing near-term relief from the current lack of portability, or unacceptable interim portability arrangements, prior to the deployment of a permanent number portability solution.

Significantly, CPC is also compatible with the LRN permanent number portability solution, which AT&T endorses (see Section II, above). In particular, much of the network and infrastructure development necessary to implement CPC appears to support evolution to the LRN permanent solution. The upgrades for switch trigger mechanisms, switch

interfaces, signaling translations, and the development of a service management system required for CPC appear to be adaptable for use in an LRN environment. As discussed more fully below, in order to mitigate the adverse competitive impact of current interim number portability arrangements, the Commission should direct industry groups to develop implementation and deployment plans for a suitable interim database solution that will serve as a transition to a permanent solution. AT&T submits that the LRN proposal should be chosen as the permanent number portability solution, and that, absent the appearance of a similar or superior database that is also compatible with the LRN, CPC should be selected as the interim number portability solution.

IV. THE COMMISSION SHOULD ENSURE THAT NUMBER PORTABILITY SOLUTIONS ARE IMPLEMENTED IN A COMPETITIVELY NEUTRAL MANNER

The Commission has also solicited comment (paras. 52, 53) on various issues, including the administration of the industry database, costs of implementing number portability, and the mechanisms that should be used to recover the costs of implementing number portability. The Commission should conclude that the costs

of number portability are justified<sup>36</sup> and far outweighed by the benefits that a competitive local exchange will produce; that these costs should be recovered in a competitively neutral manner; and that, as with 800 service, the number portability SMS should be administered by a neutral third party.

A. Database Administration

As the Commission has recognized, numbering resources should not be controlled by entities closely identified with incumbent local exchange carriers, or other industry participants.<sup>37</sup> Because a numbering administrator can favor affiliates in a variety of ways, and because

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<sup>36</sup> The costs of number portability are small in relation to the capital investments that have already been made in the public network. United States Telephone Association estimates place total local exchange carrier investment in plant at approximately \$300 billion. United States Telephone Association ("USTA"), "Phone Facts," 1994. Although hard estimates of costs are difficult at this time, reasonable estimates of number portability, using documented costs of 800 portability as a baseline, indicate that the total costs of number portability are between \$1 billion and \$2 billion. Even at the higher figure, this would represent less than 1/2 of 1% of total local exchange carrier plant. Moreover, the costs of number portability would be spread over a far greater number of carriers, many with substantial "sunk" plant investment of their own. AT&T, for example, is estimated to have over \$24 billion in plant, excluding plant associated with its wireless operations. The significant existing investment in plant of carriers other than local exchange carriers would drive the relative impact of this incremental investment even lower.

<sup>37</sup> See NANP Report and Order, pp. 3-4, 8-9.

numbering resources are critical to those seeking to participate in each segment of the industry, potential bias on the part of a numbering administrator can impair its ability to administer effectively and discourage market entry by would-be telecommunications service providers.<sup>38</sup> For these reasons, ownership, oversight and administration of the Service Management System ("SMS") supporting number portability should be vested in a neutral third party with no direct or indirect affiliation with carriers offering service using portable numbers. This third party should be selected by consensus through an inclusive industry forum or fora, and should be chartered to administer the SMS so as to ensure customer privacy and the integrity of SMS records.

While the neutrality of the SMS administrator is important, of equal importance is the prompt selection and deployment of the SMS itself. As explained more fully in Section V, the Commission must act now to address the issue of SMS administration, if the database solutions necessary to promote competition are to be deployed in time to provide near-term portability relief.

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<sup>38</sup> An administrator can, among other things, favor an affiliate in the assignment of numbers, in the provision of access to information about changes in the numbering plans, or in the provision of access to information relating to competitors and their customers.

B. The Costs of Implementing Number Portability  
Should Be Recovered In a Competitively Neutral  
Manner

The mechanisms used to fund recovery of the costs of number portability, and in particular of the SMS and its administration, must also be competitively neutral. The industry costs of number portability -- costs associated with the implementation and administration of the SMS database -- should be recovered from all of its users based on their use. In a fully developed number portability environment, local exchange carriers will "load" information concerning the telephone numbers and numbers of their subscribers into the SMS, and carriers or others operating and offering routing databases will "download" this information into their systems. Each of these groups should bear a share of SMS costs: thus, local exchange carriers "loading" information into the SMS should contribute to the SMS administrator for each subscriber profile added, deleted, or changed; and operators of routing databases should be required to contribute for each profile downloaded into their routing systems. As with the 800 portability SMS, these fees should take the form of tariffed rate elements that recover the administrative, operational, and capital costs of the SMS.

Recovery of these "industry" SMS costs can and must be distinguished from number portability costs

associated with the networks of individual carriers. The costs of designing and deploying network upgrades for number portability should be borne as other network costs of call completion are borne today -- by carriers owning and/or using those networks. Specifically, each carrier should bear the costs of upgrading its own network, either by modifying its own facilities or leasing upgraded facilities from others. This approach will ensure that each carrier can control a substantial portion of its portability costs and will not be required to fund inefficient upgrades by other carriers.

V. THE COMMISSION SHOULD DIRECT THE INDUSTRY TO MAKE A RECOMMENDATION ON ARCHITECTURE AND AN SMS FOR NUMBER PORTABILITY AND DEVELOP A COMPLETE IMPLEMENTATION PLAN

AT&T believes that immediate industry focus on an SMS for number portability is of paramount importance. Industry groups, in particular the INC, have made substantial and commendable strides in defining and analyzing various routing architectures that may be deployed to achieve a number portability solution. It is now time to consolidate these gains with equally concerted efforts to consider and determine the characteristics of the industry SMS that will support the routing architectures, and to develop an implementation plan. Without these efforts, the Commission and the industry may unintentionally and

unnecessarily delay the implementation of number portability.

To assist the Commission, AT&T has developed and offers a framework and timeline for addressing these issues. Specifically, AT&T believes that, pursuant to this Notice, the Commission should direct an industry group, such as the INC, to consider and make recommendations on the requirements for an industry SMS that will support interim and permanent number portability solutions. The Commission should also direct this industry group to develop a full plan for implementation of a number portability solution, including recommendations for interim and permanent architectures, recommendations concerning the characteristics and capabilities of an industry SMS, and plans and provisions for a transition from the recommended interim to the recommended permanent solution. The Commission should direct this group to conclude its discussions and make a recommendation by early 1996.

The Commission should then act on information gathered pursuant to this Notice and submitted in the industry recommendation to make a final determination on the interim and permanent portability solutions. After selecting the solutions, the Commission should set the industry on a dual track: all carriers should upgrade their networks to support number portability, allowing individual

carriers to decide whether to construct their own facilities or lease them from other carriers. At the same time, the Commission should select a neutral industry group, such as the INC or the North American Numbering Council ("NANC"), to choose a neutral third party to develop an evaluation process for request for proposals ("RFPs"), and to solicit bids and select a vendor for the SMS. In addition, the Commission should direct the industry group to select a neutral third party to administer the database, beginning no later than the time of the deployment of the interim solution. The Commission should require implementation of a permanent solution as soon as possible.<sup>39</sup>

In all events, regardless of its choice on an approach, the Commission must exercise leadership in the selection and deployment of a permanent number portability solution. Due to the monopoly status of incumbent local exchange carriers, market forces by themselves are not likely to lead to the deployment of number portability at all, and exclusive reliance on states will could well lead to a patchwork of inconsistent systems and standards that could stunt the potential growth of exchange competition. As with 800 number portability, the Commission's role will

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<sup>39</sup> The LRN solution makes possible a "phased" approach from an "interim" solution, such as CPC, to the permanent number portability solution.

be decisive: if the Commission acts aggressively, implementation and deployment may be rapidly achieved; if it does not, number portability may be prevented or unnecessarily delayed by various industry segments.

VI. PORTABILITY OF NON-GEOGRAPHIC NUMBERS IS NOT ESSENTIAL TO LOCAL COMPETITION

The Commission seeks comment (para. 69) on its tentative conclusion that "service provider portability for 900 and 500 (PCS N00) numbers is beneficial for customers of those services." Specifically, the Commission seeks comment (id.) on the costs of making such portability available, whether portability for non-geographic numbers should be provided by the same method as geographic numbers, and whether the public interest would be served by the Commission's mandating portability of 900 and 500 services. In AT&T's view, the benefits of portability for these services are less apparent and this issue should not delay implementation of number portability for geographic numbers.

A. 500 Service Provider Portability

Finally, the Commission seeks comment (para. 78) on the effect that 500 ("PCS N00") service provider portability may have on demand and prices for PCS N00 Service and the relative advantages and disadvantages of the various portability solutions proposed in the Industry

Numbering Committee Report on PCS N00 Portability.<sup>40</sup> In addition, the Commission seeks comment (para. 79) on the recommendations made and issues referred to it by the Industry Numbering Committee.<sup>41</sup>

In the future, it is conceivable that number portability will enhance competition and increase customer choice in the 500 ("PCS N00") services market. The Commission must, however, recognize that the market for PCS N00 services has yet to emerge and that many of the customer needs that will define PCS are still evolving. The competitive benefits of PCS N00 portability can only be assessed when the market has matured fully. It is clear that this maturation process will require a number of years.

Because the benefits of PCS N00 portability will be realized primarily in the future, and because portability of geographic numbers is of such immense and immediate significance for potential competition in the local

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<sup>40</sup> See Letter from Denny Byrne and Robert Hirsch, Co-Chairs, INC, to Kathleen Wallman, Chief, Common Carrier Bureau, FCC, dated May 17, 1995 (attaching INC Report on PCS N00 Portability, INC 95-0512-010 ("PCS N00 Portability Report")). The INC has outlined and recommended a "high-level" database architecture for a PCS N00 Portability solution.

<sup>41</sup> The INC has concluded that it should seek guidance from the Commission on certain regulatory issues. Specifically, the INC has requested guidance on SMS, costs recovery, and deployment date issues. See NPRM, para. 76.

exchange, the Commission need not and should not attempt to implement both portability solutions now. Rather, the Commission should move forward immediately with number portability for geographic numbers in order to ensure that local competition is given the best opportunity to develop and flourish. The knowledge and experience the Commission and industry gain in implementing the optimal solution for geographic numbers should then guide the Commission as it resolves the implementation issues raised by portability for PCS N00 services, which will be easier to consider at that time.<sup>42</sup>

B. 900 Service Provider Portability

There are also unique characteristics of the 900 services market that should be taken into account before a portability decision is reached for this service.

900 service provider portability could increase the choice, and possibly lower the price, of underlying transport used by information providers (IPs) using 900 service. Due to the structure of the 900 services market, however, it is not clear that any such lower transport costs

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<sup>42</sup> When the Commission addresses PCS N00 portability, it should follow the framework outlined by the INC in the PCS N00 Portability Report. The Report identifies as a starting point a "high-level" architecture, which is based on a nationwide SMS linked to regional SMSs, regional routing databases, and carrier signaling networks. See PCS N00 Portability Report, p. 3.

would result in lower prices for end users. End users pay prices, set by the IPs, that are largely unrelated to tariffed transport rates. Indeed, transport costs comprise only a small fraction of the total price paid by callers to 900 services, and reductions in these costs likely would not appreciably affect the price of the service to the end user. At the same time, 900 service provider portability would almost certainly cause a significant increase in other costs of 900 service by increasing network and administration costs, uncollectible billings, and driving an overall increase in billing charges for 900 services.

#### CONCLUSION

For the reasons stated above, the Commission should adopt rules moving the industry promptly toward implementation of an interim database and a permanent number portability solution.

Respectfully submitted,

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