As competition develops, new competitors may not choose to serve the same coterminous exchange areas as the incumbent, nor choose to provide similar local and/or toll calling areas. This dichotomy may require network routing changes as well as changes to customer equipment and dialing patterns. Options for addressing this concern are: (1) avoid a regulatory solution and allow the market to adjust in response; (2) require new entrants to maintain the same EAS routes as the incumbent at least for billing purposes; (3) eliminate EAS routes; and, (4) require the incumbents to allow new entrants to route traffic over EAS facilities.

Technical descriptions of the new service areas and unbundled functionalities need to be developed. Some of the areas under study are the standards of EAS interconnection and whether other standards besides the Bellcore "Notes on the Network" should be used. Another area under study is to determine which standards should apply to the unbundling of the incumbent's EAS functionality so that the competitor may purchase EAS calling along with other functionalities.

I. Standards

The technical standards that currently apply to incumbent LECs must also be applied to new LECs. All network providers should be required to follow:

1. ***the North American Dialing Standards,***
2. ***Part 68 Standards,***
3. ***Service quality standards, and***
4. ***Interconnection standards.***

These should be minimum standards required today, which should be allowed to evolve as technology and market needs change. Minimum service standards must be fashioned to include access to vital services (e.g., access to 911, Telecommunications Relay Service, etc.).

Telecommunications service providers must be given reasonable advance notice of network changes comparable to the same amount of lead time and detail as incumbent affiliates will enjoy. Consumers, regulatory authorities, and other interested market players must have an opportunity for input on the future standard-setting process. Development of a list of providers who need to be noticed regarding future standard modifications is required.

Regulatory oversight is needed to enforce non-discriminatory use of the selected standards. This regulatory process must allow for complaints to be filed on technical quality, call completion, integrity and billing. Some form of liability needs to be developed if the

standards are not met. An industry forum must be available to resolve issues related to interface standards in a timely manner. The CSCP described in Appendix A would be an appropriate mechanism.

For customers to be aware of the service standards, a published, detailed, engineering/policy specifications on all services need to be made available to each customer a minimum of three times: at the time the services are purchased; when standards are being considered for change; and when a standard is changed. The service specifications should also be available to anyone upon request.

The issue of standards impacts both the state and federal jurisdictions and is a crucial factor towards maintaining the integrity of a seamless network-of-networks. Additionally, administrative requirements are needed to deal with who is responsible for network integration, reliability and maintenance and will set forth the rules, agreements, and procedures the various providers will employ to ensure a workable network.

Regulatory requirements regarding operational standards cannot differ between carriers based on the regulatory status of the carrier. All carriers need to adhere to the same ground rules regarding the interconnection and interoperability of their networks. Regulators must insure that all market entrants conform to the regulatory standards necessary to meet those goals. Initially many of the operational requirements may appear to fall on the incumbent carrier since early regulatory effort will focus on interconnection. However as competitive networks develop the operational standards should be mutual and impose equal rights, duties and responsibilities on all market entrants

Technical standards set equipment manufacturing specifications. Technical standards should include criteria relevant to network routing, call completion, billing and other appropriate interconnection applications. In addition, the use of standard interfaces will ensure the competitors' technical ability to interconnect to LEC facilities. The use of industry standard equipment and interfaces supported by published practices, procedures and specifications, accessible throughout the industry, is in the public interest and is essential to the creation of a fully competitive integrated network.

Service standards must be maintained and enforced upon all local exchange service providers so that customers continue to receive quality telecommunications service. Existing rules, regulations and standards should be reviewed and modified for their applicability to all exchange service providers, if necessary. Specific state reporting requirements may apply or may be developed in the future.

Reporting requirements are needed to monitor compliance with minimum technical interface and quality of service standards. Regulatory oversight may be needed

to ensure standards are implemented uniformly and to provide a medium for complaint resolution. Parity reports may be appropriate to ensure that carriers do not discriminate in the quality of service they provide among, for example, competitors, affiliates and end user customers.

Interconnection standards have evolved over the years to assure the high standards of the telephone network are maintained and fostered as new services and providers are introduced. Certified industry standards bodies (e.g., International Telecommunications Union and American National Standards Institute) and individual companies have identified interconnection requirements for specific services and providers. These distinct requirements delineate inter-company responsibilities and expectations dependent on the type of interconnection. These requirements are applicable for all participants offering like services in a like manner.

Individual carriers are continually updating their networks to incorporate new technical arrangements (e.g., deployment of Signaling System Update 7 (SS7)). The transition period associated with these modifications and notification (e.g., network interface disclosure document) of these changes are the responsibility of each carrier. During this period and after, it is the continued responsibility of the individual carrier to insure network-to-network interconnectivity and support of existing services. Modification to existing interconnection standards or the development of new standards should be coordinated through the appropriate industry body.

There are technical arrangements currently that can be utilized by new entrants upon receipt of certification to interconnect with the PSTN (e.g., tariffed switched and local dedicated transport access offerings). These arrangements should be made reciprocally available to all providers. However, arrangements may need to be developed for new interconnection arrangements envisioned at the line side (e.g., loop) level. These new arrangements must be developed in a manner so as to ensure a consistent standard of operation by all parties and be universally available among competitive local providers.

Standards for end user customers have also been developed. End user customers of telecommunication services have a separate set of technical arrangements available for interconnecting to the PSTN. These arrangements are the obligation of all LECs and are made available both through general tariff service offerings as well as contractually. It is believed that they are sufficient to meet the current technical needs of the end user customers. If the need for new services arises in the future, however, technical standards will be developed as necessary. As is stated in a recent Institute of Electronic and Electrical Engineers (IEEE) article other activities will be undertaken for the connection of world wide construction of the infrastructure and harmonization among these activities will be necessary in the near future

The consumer should not have to worry about buying facilities from different companies and making them work. The network will be constructed in a manner that allows the customers to mix and match companies' services and they should operate with minimal technical knowledge required of the customer. The network should provide services in a reliable, non-discriminatory and open manner and at a reasonable level to meet the needs of the consumer. A further standards issue is what is required of every provider to ensure that the PSTN is technologically user friendly, interconnected, and provided in a manner that does not allow any one provider preferential access to customers.

J. Right of Way Issues

All telecommunications companies should have equal, nondiscriminatory access to public and private rights of way, and the facilities located therein, such as poles and conduits. Incumbent local exchange carriers should be required to provide nondiscriminatory access to their facilities located in rights of way and provide public notice of the terms and conditions of access. Legal constraints to realization of these recommendations should be eliminated. Technical standards should be implemented to assure safe construction of facilities and that reasonable access will be provided to existing facilities in order to conserve resources and provide minimal aesthetic intrusion while constructing these new networks.

Municipal and other local governments require utilities to enter into licensing and franchise agreements to operate and place facilities on or in reserved easements. In most localities, a public utility is able to assert the right of eminent domain in the acquisition of right of way easements to install its facilities, which may include condemnation of private property. Further, utilities have a longstanding tradition of agreements with respect to the mutual, cooperative use of other utilities' poles and conduit spaces.

Attendant to their role as the traditional providers of telecommunications services, incumbent telecommunications companies have encountered little difficulty or obstacles to obtaining access to public and private rights of way. Ancillary to this access has been the incumbent service providers' historical ability to install facilities such as poles and conduit in or on rights of way. Rights of way are a limited resource, by virtue of the finite amount of space available, as well as limitations on the inconveniences and intrusions that accessing rights of way can cause and that local governing authorities are willing to tolerate.

New entrants that seek to provide facilities based local exchange service will need to procure access to public and private rights of way based on equivalent terms and

conditions that were offered to the incumbent telecommunications company. To achieve a truly competitive marketplace which would allow new entrants the option of deploying their own facilities, open access to all telecommunications carriers' public and private rights of way and rights of way facilities is essential. Because rights of way are a limited resource, restricted access thereto for new entrants could be a barrier to entry. To avoid this potential obstacle, incumbent as well as all other telecommunications service providers should be obliged to make their spare rights of way facilities available on an open and nondiscriminatory basis. The public availability standard could be met by requiring the filing of either tariffs or contracts (rates, terms and conditions should be published). This approach implicitly adopts a regulatory parity framework for regulating incumbent carriers and new entrants to the local exchange market. New entrants that obtain the same regulatory authorizations to compete with incumbent telecommunications must also comply with the accompanying public service responsibilities.

Technical standards should also be established to ensure safe construction of facilities and reasonable access to existing facilities in order to conserve resources and minimize physical intrusions on the right of way areas.

To provide a forum to facilitate the removal of barriers to entry which can provide an opportunity for timely redress of potential problems regarding access to rights of way, state utility regulatory commissions should oversee the rental or sale of rights of way facilities. However, this oversight may not be feasible since access to rights of way for facilities placement is governed at the local level and/or outside the purview of state utility regulatory commissions in many states

An important caveat to this discussion is that the use of private rights of way by new providers either by rental or purchase of incumbent rights of way facilities or actual placement of facilities in the rights of way may be impeded, perhaps expressly prohibited, by the terms of private contracts between an incumbent provider and landowner which may prohibit or limit the incumbent provider's resale ability. This limitation is surmountable, however, by providing all local exchange telecommunications companies with the same rights to exercise eminent domain, which will establish the negotiating leverage for companies to obtain access to private rights of way.

Local and state regulatory bodies with oversight authority for rights of way and or facilities located within the rights of way should be required to implement nondiscriminatory policies which would provide equal treatment to all telecommunications service providers. This recommendation may require legislative or other remedial efforts to assure that state and local governing authorities discharge their oversight authority regarding rights of way in a fair and nondiscriminatory manner. State utility regulatory commissions should be available as a forum to enforce open access policies regarding the lease/rental of rights of way and facilities located in or on rights of way. If formal authority does not rest with state commissions, they nonetheless should attempt to informally

facilitate the resolution of such disputes and issues. Additionally, state regulators should remain informed of activities in other states as a tool for evaluating the effectiveness of, and considering the implementation of, various regulatory models addressing right of way issues. Because of the dispersion of regulatory authority with respect to rights of way access among state and local governing authorities, there is a need for ongoing dialogue and policy coordination among the various arms of government. A collaborative, consistent regulatory approach to these concerns will facilitate the achievement of the goal of open and nondiscriminatory access to this limited resource so as to enhance rather than hinder the development of local exchange competition. Dialogue and coordination should also consider the establishment of uniform technical standards and uniform access policies so that new entrants could rely on consistency of regulatory requirements among various local governing entities.

K. Numbering

1. Numbering Resources and Administration

Numbering resources should be administered by a neutral, third-party administrator. All telecommunications service providers should be allowed to have electronic interface capabilities with the number administration systems.

Carriers cannot offer a telecommunications service, and customers cannot utilize such services, without an identifiable number. Therefore, it is important that numbers should be administered in a fair and non-discriminatory manner. Numbering resources should be treated as a valuable common property resource.

Ideally, a number should be assigned to the end user who purchases a telecommunications service that requires a number. If end-user assignment of numbering resources proves to be too expensive or unduly burdensome, then carriers should acquire number resources on behalf of the customer.

Currently, the carrier will assign a number to a customer out of a particular NPA-NXX[18] block that was assigned to it by the local number administrator. A particular NPA-NXX identifies both the carrier who "owns" the NPA-NXX and the rating point associated with that number. As a result, the carrier must be assigned a block or blocks of NPA-NXXs if it wishes to be identified as the carrier associated with that number. Each assigned NPA-NXX represents 10,000 assignable phone numbers, and a carrier needs an entire NXX even if it serves only one customer (or number) out of the rating area identified by the NXX.

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[18] NPA is Numbering Plan Area and commonly known as the area code. NXX is a three digit number identifying the central office and the rating point.

The numbering resources should not be administered by an entity that has a stake in telecommunications services. A third-party numbering administrator has the best chance of providing number administration in a fair, impartial, and non-discriminatory manner. Ideally, this third party should have no affiliation with any telecommunications interest. The administrator could be a private or government entity but should operate with input from all telecommunications stakeholders.

These principles are consistent with those adopted by the FCC in July 1995 in CC Docket No. 92-237. The FCC ordered the establishment and selection of a neutral third-party administrator, the NANP Administrator, to take over the duties of number administration from Bellcore. The FCC concluded that the NANP Administrator shall also take over the duties of the central office code administrators. A North American Numbering Council (NANC) is to be created to act as policy maker and initial site for resolution of disputes relating to administration of the NANP. The NANC is to select the NANP Administrator and is to provide advice and recommendations to the FCC to foster efficient and impartial number administration.

Telecommunication service providers should be allowed to have electronic interface capabilities to access the phone number administration systems in order to provide timely assignment of phone numbers. They should also be allowed to have responsibility for "aging" these numbers when disconnecting and reconnecting lines.

2. Number Portability

The FCC should develop broad national guidelines for number portability. If number portability is intra NPA or area code, then it resides in the state jurisdiction only. However, the FCC and states should work cooperatively to resolve interstate differences if they develop.

Regulators should take steps to ensure that any number portability solution benefits all industry players equally. It is essential that the development and operation of a number portability database not be assigned to the incumbent local exchange service provider. The database should be developed and operated by a neutral administrator.

A significant barrier to the ability of competitive carriers to attract customers is the lack of customer control over number assignments. Telephone numbers have traditionally been identified with a specific central office in a specific geographic area, and not with a specific customer. Number portability will be a significant transfer of control of the telephone number from the telephone company to the individual customer. Individual customers would then have the choice to keep it if a transfer is made to an alternative carrier, location or service. There are public and private benefits of number portability: the

public benefits from enhanced competition (promises of lower rate, better quality service, enhanced services) and the private benefits to customers that wish to retain their telephone numbers. It is commonly accepted that number portability is a necessary element to facilitate local exchange competition. One barrier to the introduction of such competition is perceived to be end user reluctance to select a new local service provider if it would require a change in telephone number.

Number portability can be further defined into three types of portability: location portability; service provider portability; and, service portability. Location portability would enable users to take their existing number with them when they move. Service provider portability would enable users to take their existing numbers with them when they change service providers and is only applicable when there is competition within a specific market area. Service portability would enable users to take their existing numbers, which are unique to their existing specific services, with them when they change to a different service

The telecommunications industry is currently utilizing number portability with 800 services. Use of 800 database architecture could be adapted to provide number portability. LECs have proposed adapting several of their current tariffed retail service offering as "interim solutions" until a long term solution can be implemented. Interim solutions however, may be too costly for new LECs (unless repriced); may not be suitable for data transmission; may result in the loss of certain capabilities, for example Caller ID; and will involve the incumbent LEC in every call.

There is little information available concerning the cost of long-term number portability solutions. Even the cost information on interim solution trials is not available yet. However, as time passes and trials with number portability conclude, one would assume cost information and analysis will become available.

There is a debate as to whether there currently are technological obstacles to the implementation of a service provider number portability solution based on screening of a number against a regional or local database. Some proponents of service provider portability suggest that it could be implemented quickly. Other proponents advance that a service provider portability solution must be developed and is not readily available in the near term. Cooperation with other states, with federal agencies, and with the relevant standards organizations could reduce cost and lead to a solution that is acceptable to many

If it is technically and economically feasible, a service provider number portability solution should be implemented that has the capability to expand to location portability in the future Most of the basic call models that have been proposed would allow location portability Current plans to focus on service provider number portability are based, not on technical problems, but on potential customer confusion and on the costs

of modifying both LEC and IXC billing systems, potentially throughout the NANP Area, to provide location portability.

Based on the industry's experience with 800 portability and discussions to date on the subject of number portability, it is generally agreed that a full function, mature number portability architecture will be based upon a database solution where database records contain information associating telephone numbers with the local service provider and the necessary routing information required for call completion. The mobile nature of wireless services could also lead to a greater acceptance of non-geographic phone numbers. Utilizing a database architecture for service provider portability could meet the goal of a seamless network to assure that all carriers can efficiently route ported numbers and all carriers can control their number portability costs.

The responsibility for the technical implementation of a permanent number portability solution must be shared by all service providers to the extent technically and economically feasible. Long term number portability solutions should be administered by a neutral third party. The neutral third party selection should be determined by the industry and approved by the state commissions, separately for each jurisdiction.

At this time, the industry is making some progress toward assessing the various alternatives for portability which have been proposed. Ongoing industry efforts include state-level trials or workshops in several states, including Illinois, Michigan, Maryland, New York and California. Moreover, on July 13, 1995 the FCC released a Notice of Proposed Rulemaking (NPRM) on number portability (CC Docket No. 95-116). The NPRM addresses a broad range of portability issues. Local development should continue and expand to state and regional levels.

Number portability should be required when the state commission determines that it is in the public interest. To determine whether it is in the public interest will require an assessment of whether the benefits exceed the costs and how the costs will be recovered. The type of number portability to implement depends on many factors. Service provider portability should be implemented, at the minimum, because competition among service providers is the main basis for the need for number portability at this time.

3. Pay-Per-Call and Special Dialing Patterns

All carriers should be required to complete all calls as dialed, absent a customer blocking request, lack of billing and collection agreement (pay-per-call calls), or other compelling reasons. The industry should work together to develop nondiscriminatory billing administration and special dialing pattern guidelines to accomplish call completion.

Abbreviated and special dialing patterns are a special case of the NANP. Special dialing patterns include numbers in the form N11, N00, #XXX, XXX#, *XXX, etc. Completion of special dialing pattern calls depends upon the effective geographic scope of the dialing pattern, network translation and routing, and negotiation of billing and collection agreements between multiple providers. Because of potential allocation and technology problems associated with these limited resources and special dialing pattern calls, certain parameters may have to be developed so that special dialing pattern numbers are assignment and technology neutral.

In general, carriers should be required to complete pay-per-call and special dialing pattern calls originating from customers of another carrier, unless there is a compelling reason not to. Circumstances where the call could be appropriately blocked would include a blocking request by the end user customer for certain types of calls. Additionally, call completion would be dependent upon the existence of a billing and collection agreement between the originating carrier and service provider and the appropriate technology.

Both the service provider and originating carrier make the business decision whether or not a billing and collection agreement can or should be negotiated; if a billing and collection agreement is approved, the terminating carrier should complete the call to the service provider at standard termination charges.

Some new entrants expressed the opinion that originating providers may want to assess some sort of surcharge for pay-per-call calls, based on the profitability of the pay-per-call service. The originating carrier may be entitled to assess a charge to the service provider for the use of its network, but should not be entitled to levy a charge based on the profitability of the pay-per-call service.

4. Area Code Relief

Area code relief should be implemented in a competitively neutral manner. An area code relief plan should be determined by the affected state, so that it is responsive to local concerns and conditions and minimizes consumer confusion.

In determining which type of area code (NPA) relief to implement, at least four issues need to considered: (1) whether the relief plan can be implemented before numbers within the NPA are completely exhausted; (2) the effect of the relief plan on customers or customer classes: (3) the extent to which the relief plan is competitively distorting; and (4) the durability of the relief plan. The four basic types of NPA relief plans are an NPA split, overlay, boundary realignment, and combinations of the aforementioned types.

There are positives and negatives associated with each type of NPA relief. An NPA relief plan may necessitate changes in traditional dialing patterns and existing telephone numbers. Along with the inconvenience to the end user customers, carriers are faced with the costs of implementing the new NPA, including the costs of customer education. In addition, NPA relief should be nondiscriminatory, i.e., carriers should not be discriminated against based upon their technology.

The form of NPA relief to implement should be left to the states. Each area will have its unique circumstances, and the affected state is in the best position to determine the appropriate type of NPA relief that should be adopted. State considerations and decisions are commonly based upon local factors such as the total number of NPAs in the area, the frequency of NPA relief required, the level of competition, the presence of number portability, and differing public opinion in the affected area.

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V. Carrier Regulation

A. Introduction

Differences in market power dictate differing levels of economic regulation. At the outset of local exchange and access competition, incumbent LECs will have market power. As market power erodes, the need for differential economic treatment will diminish. While the assertion that all carriers with control over a monopoly bottleneck should offer related services at cost justified, non-discriminatory rates has appeal, it assumes that competition will be ineffective in diminishing monopoly control over certain facilities.

One view holds that if new entrants can provide loops, then these facilities have lost the character of a monopoly and the treatment of incumbent LECs may need to be reevaluated. However, if there are a limited number of competitors and high barriers to entry, carriers may be unwilling to provide access to essential parts of their network for resale. The reluctance of cellular duopolists to resell essential components of their network to switch based resellers illustrates this possibility. Regulating all competitors as monopolists would address this concern, but perhaps at too great a regulatory cost. Another view holds that terminating access will remain a bottleneck function regardless of how many providers operate in a given area.

B. Franchise and Certification Requirements

State regulators should assist lawmakers in crafting statutes that do not unreasonably restrict local exchange competitors from obtaining franchises or certificates to operate. The criteria used in determining whether an applicant is qualified to receive authority to provide local service should include minimal financial, technical, and managerial capability and acceptance of all relevant regulations, such as consumer protection rules and quality of service standards. The effect upon the financial condition of the incumbent should not be a consideration when authorizing entry.

In order to provide utility service, a company must first obtain the proper licenses and certificates from the locality or state within which it serves. To provide facility-based telecommunications services (as opposed to resold services), a company must be permitted to construct aerial, buried, and underground facilities to serve its customers.

Statutory and regulatory requirements for franchises and certification are among the strongest barriers to the entry of competition into the local exchange market. State regulators should assist lawmakers in crafting statutes that do not unreasonably restrict local exchange competitors from obtaining franchises or certificates to operate.

The criteria used in determining whether an applicant is qualified to receive authority to provide local service should include minimal financial, technical, and managerial capability and acceptance of all relevant regulations, such as consumer protection rules and quality of service standards. The effect upon the financial condition of the incumbent should not be a consideration when authorizing entry.

C. Local Service Requirements

> ***New entrants should be required to provide 911, operator services, directory assistance, and connection to interexchange carriers. If the incumbent local exchange carrier provides 911/E911 and telephone relay services, it should make them available to other carriers on terms similar to those it imposes upon itself and its customers, but it should be able to recover interconnection costs (and a reasonable contribution).***

Incumbent providers have defined areas in their service territories that are classified as the "local calling area" for each exchange in their local service areas. There is a need for some definition of the local calling area for new entrants. If new entrants are to participate in any type of universal service high cost fund, it will be necessary to determine the area being served by these providers. Defining the area will also save customer confusion and provide more comparable data for reporting mechanisms that may be instituted by state regulators. These calling areas will not necessarily need to mirror the incumbent existing local calling areas.

New entrants should be required to provide the services that historically have been created to provide emergency services access and necessary connection to the communications infrastructure. These services should include at a minimum, 911 service, telecommunications relay service (TRS), operator services, nondiscriminatory connection to all IXCs and directory assistance. If the incumbent LEC provides 911/E911 and TRS services, it should make them available to other carriers on terms similar to those it imposes upon itself and its customers, but it should be able to recover interconnection costs (and a reasonable markup over cost).

Since all (facilities-based) providers must be able to access or obtain information from Line Information Data Bases (LIDBs) or LIDB-type databases in order to serve their customers no provider should be allowed to impede competition by refusing to provide data base access to other authorized providers.

D. Directories and Customer Lists

> ***To the extent that subscribers wish to be listed, all local telephone service subscribers should be listed in a comprehensive directory***

(telephone book) that includes subscribers of all telephone service providers in the subscriber's local calling area. Incumbent local exchange companies should make their directories available for entrants to distribute to their subscribers at reasonable costs. Facilities based entrants that elect to list their customers in the incumbents' directories instead of providing their own inclusive directories should also pay the incumbent local exchange company rates that reflect the costs of the directory listings (white page listings) and provide a reasonable markup over cost. In an unbundled environment, the directory listing may be bundled in the port rate or unbundled as a separate rate element. The incumbent should be required to impute the rate for directory listings in its residential and business line rates.

Subject to privacy restrictions, local telephone service providers should be required to furnish current listings of their customers to other providers.

To the extent that customers wish to be listed, providers should be required to include all subscribers to the PSTN within their local calling area in whatever directories (telephone books) they issue to their customers. Incumbent local exchange companies are obligated by many state regulators to publish annual directories. However, there is disagreement about including competitors' customers in their directories. New entrants want the same terms and conditions for their customers as currently given by the incumbent to the incumbent customers. Incumbents generally prefer to offer new entrants directory listings at current tariffed rates.

Customers in a competitive environment will benefit from a comprehensive directory. Incumbent local exchange companies should make their directories (telephone books) available for entrants to distribute to their subscribers at reasonable rates. In an unbundled environment, the directory listing may be bundled in the port rate or unbundled as a separate rate element. The incumbent should be required to impute the rate for the directory listing in determining its rates for residential and business lines.

Subject to privacy restrictions, local telephone services providers should be required to furnish current listings of their customers to other providers.

In an interim number portability environment where remote call forwarding is employed, both the ported number and the customer's assigned network telephone number should appear in the directory listings database at no additional charge. The ported number, which is the commonly viewed end user telephone number, should be required to appear in the published directory, whereas the assigned network number need not appear in the published directory. The listing of both the ported and assigned network

numbers in the directory services database would permit accurate "reverse searches" requested by customers when the ported number was transported via SS7 as the "calling party number."

E. Tariffing Requirements

New entrants should be required to file tariffs. In general, cost studies are not required unless proposed rates for access and interconnection are in excess of the incumbent LEC's rates.

New entrants should be required to file tariffs, which includes prices, terms and conditions of service. In general, they should not be required to cost justify tariffs, except for access and interconnection rates that are in excess of the incumbent LEC's rates. The primary purpose of tariffs will be to provide the information necessary for regulators to determine the reasonableness of service offerings and prices (vis a vis current offerings and prices), and the status of marketplace activities. Although regulators may desire to permit new entrants or even responding LECs to custom tailor offerings to meet customer needs, there is a trade-off in doing so. The more complex and differentiated tariffs become, the less useful they become to consumers and regulators. Simple tariffs facilitate the resolution of consumer complaints.

F. Rate Design and Pricing

1. Cost-based Pricing

All services, whether retail or network components, should be priced to recover at least Total Service Long Run Incremental Cost.[19] Subject to state commission oversight and review, prices may include a markup over TSLRIC to reflect a reasonable allocation of joint and common costs. The appropriate markup may differ for various network components, but essential or monopoly services and functions should not carry an excessive allocation of joint and common costs.

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[19] Total Service Long Run Incremental Cost (TSLRIC), generally viewed as consistent with Long run service incremental cost (LRSIC), is the total cost resulting from adding a service or function. TSLRIC is the difference between the company's total cost when the service is being produced and the company's total cost when the service is not being produced. TSLRIC is based on the assumption that the least cost method of production is used both when a service is being produced and when it is not. Thus, TSLRIC calculations should assume that the company will reoptimize its input mix and facilities when a service is added to the existing product mix. Stand-alone cost is the cost of producing a function or service by itself. If a firm has economies of scope, the total cost of producing several services will be less than the sum of the services' stand-alone costs and greater than the sum of the services' TSLRICs. Because some shared costs are not included in calculations of TSLRIC, a firm that collects only TSLRIC from all of its services will not be able to cover its total costs, including overheads, and could not remain viable over the long term.

As competitive providers enter local exchange telephone markets, prices of services at both the retail and wholesale level become important. If retail services are priced too far above cost, inefficient entry may result. If retail services are priced below cost, efficient entry may be thwarted.

At the wholesale level, pricing of network components is extremely important for the viability of competition for two reasons. First, the incumbent produces essential or bottleneck functions that will be used by entrants to provide service to their customers. These essential or bottleneck functions cannot be produced by the entrants or obtained on reasonable terms from other sources. Second, the initial phase of retail competition will be based largely on resale of the incumbent's services. If network components are priced too high, a barrier to competitive entry may be created. If network components are priced too low, the incumbent may be harmed, as resellers may purchase unbundled services and rebundle them at less than the incumbent's total cost. To prevent anticompetitive pricing, cross-subsidies, and harm to the incumbent, prices must be based on the cost of each service element. The determination of the appropriate level of costs should take into consideration and be consistent with the jurisdictional separations rules.

This issue may be viewed from several perspectives including those of setting rates for newly unbundled network components and revising rates for current retail services. Especially important is the pricing of network components. The pricing of the essential or bottleneck functions and services that are produced by the incumbent and used by entrants to provide service to their customers may create a barrier to competitive entry into local exchange telecommunications

If competitive entry is not feasible or allowed, there may be relatively little perceived harm from setting some rates without regard to costs. However, if competition is feasible and allowed and entrants must purchase inputs from and compete with the incumbent at the retail level, prices of various services must closely reflect costs in order to provide correct signals to the incumbent, potential entrants, and end users.

Opening local exchange markets to competition requires that cost-based rates be used for the protection of both the incumbent and the entrants. However, even though several states are studying it, no publicly available cost studies are available for the myriad telecommunications services and network functions that exist in today's network. As the necessary cost studies are completed, prices should be re-set to better reflect the cost of service. The introduction of cost-based pricing at the retail level may require new consumer safeguards such as explicit support mechanisms, and the profitability of market segments may be affected by the extent to which entrants are required to participate in funding explicit support mechanisms.

Another cost standard is avoided cost, a measure of the short-run incremental cost savings that result from not providing a service or not serving a customer. Avoided cost measures the direct "out of pocket" costs associated with a service. So long as a service is priced to recover something above avoided cost, it is making some contribution to joint and common costs, and the provider is better off selling it, at least in the short run. If a service is priced to recover less than avoided cost, the provider would be better off not selling it. If the service is priced at avoided cost, the provider would be indifferent between selling and not selling it. In competitive markets, a product or service will be produced, at least in the short run, so long as it can be sold for at least its avoided cost. However, because avoided cost is a short-run concept, pricing at that level is not a viable long-run strategy

In general, selling below avoided cost is not rational (profit maximizing) even in the short run. Nevertheless, there may be situations in which a service temporarily is sold below avoided cost. One such situation is pricing new or experimental services, which may be priced below avoided cost for some period based on the expectation that, as penetration or usage increases, the service will become profitable and the profits will, over time, more than offset the short run losses incurred. However, even in this situation, services must be priced to cover avoided cost based on anticipated levels of demand, even if they do not do so based on initial levels of demand.

One possible use of avoided cost is to set a floor for the prices of competitive services, except in very limited circumstances such as the example given above. For example, when faced with competition, it might be acceptable to price a service as low as avoided cost in the short run. Another possible use of avoided cost is to determine the minimum discount from bundled rates that must be given when unbundled services are priced. For example, if one or more formerly bundled functions is provided, the minimum discount from the bundled rate would be the total avoided cost of functions not provided (adjusted for any costs of unbundling). In the case of pricing of services for resale, the reseller should receive a minimum discount equivalent to the costs that the incumbent avoids as a result of selling them to the reseller rather than selling them to its retail customers.

However, pricing at avoided cost may not be appropriate in either of these cases. Care should be exercised when using avoided cost as a price floor for competitive services. Because of its short run focus, which does not make allowance for contribution to joint and common costs, pricing at avoided cost is not a viable long run strategy. A TSLRIC floor also excludes joint and common costs, but it may prove to be more appropriate because it has a long run focus

Using avoided cost to set the discount for unbundled components may also be inappropriate. The price of a bundled set of functions has some contribution spread over all the components. If the price of unbundled functions recovers the bundled price

less the avoided cost of the functions not provided, the contribution formerly derived from the entire bundled set will be placed entirely on the unbundled components. This will result in excessive contribution from the unbundled components and may inhibit competition. A more reasonable approach would be to spread the contribution over all the components. The long run focus of TSLRIC plus a reasonable contribution may be still better

There will be considerable debate among the incumbents and entrants as to the correct method of calculating TSLRIC and the appropriate markup over TSLRIC to reflect some contribution to joint and common costs. Consequently, state commissions will have to maintain an oversight and review function over TSLRIC calculations and pricing. Though no specific rate structure or recovery mechanism is implied, essential or bottleneck network components should be priced to allow aggregate recovery of TSLRIC plus a markup. Competitive services should be priced to recover at least their TSLRICs to avoid charges of anticompetitive pricing and cross-subsidization. Moreover, although the appropriate markup may be different for various services, monopoly or essential services and functions should not bear an excessive markup or share of joint and common costs. Further, that markup should not be viewed as replacing the forgone contribution resulting from the incumbent's lost retail sales.

2. Imputation

All incumbent LEC exchange services, including unbundled network components, should be priced to reflect the economic costs of providing the services or components. All customers of the LEC network components, including the LEC itself, should pay the same price for the component. LECs must impute the rate charged for each network component in the rate of the bundled service. Discounts may be provided to reflect inferior service.

An imputation test should make allowances for any documented cost savings that result from bundled provision of services and possibly from jurisdictional cost allocations. For services which are priced below costs, it may be inappropriate to require imputation. However, instances of below cost pricing should be rare.

With the opening of local access markets to competition, the incumbent LEC will be both supplier to and competitor of the new entrants. In addition, the incumbent LEC will offer a full range of monopoly and essential services, and it will have the vast majority of customers. The dominant position of the incumbent will create opportunities for it to engage in anti-competitive pricing of its services and treatment of entrants. Thus, it is appropriate to recognize the differences in market power that inure to the incumbent

relative to entrants and impose a greater level of pricing regulation on the incumbent as may be needed, at least until local access competition is an established fact.

Charges for access and termination should be set at levels that promote efficient entry and do not provide advantage to either incumbents or entrants. This is one of the crucial steps involved in establishing and promoting local competition. One method of ensuring that access and termination charges do not advantage incumbents is to require that, in their local usage charges, incumbents impute access and termination rates equivalent to those charged to competitors. As entrants gain market share, it is possible that their rates and charges would be subjected to the imputation test, as well.

Competitive entry in local access markets is desirable so long as it benefits consumers of telephone services. Both incumbents and entrants should be provided incentives to deliver high quality service at low cost to consumers. Therefore, providers should be allowed to structure themselves to deliver service as efficiently as possible. Entrants should be allowed to purchase functions from incumbents on terms that promote efficient competition, but such purchases must make some contribution to the incumbent's joint and common costs. The incumbent's rates for competitive services should also contribute to recovery of joint and common costs. Commission oversight of compensation rates is required to ensure that the contribution is not excessive.

3. Local Call Termination Rates

As a first step in implementing local competition, bill and keep could be used between local service providers. If explicit inter-carrier compensation is mandated, local termination charges should be based on TSLRIC studies with only a reasonable loading of common overhead. Termination charges should be based on costs incurred. Thus, the carrier common line charge (CCLC) and residual interconnection charge (RIC) should not be included in traffic sensitive local termination rates, as they do not reflect traffic sensitive costs incurred in terminating calls. The coexistence of local termination charges and flat rate pricing of local usage is a particularly difficult problem. The local termination rate should be balanced against flat rate usage in order to equalize the minute of use traffic costs between the entrant and the incumbent.

Rate parity between traffic sensitive local and toll termination charges, if cost justified, could reduce billing expenses and remove arbitrage opportunities. Whether differing local and toll rates or a common termination rate are utilized, network traffic should ultimately be monitored. At a minimum, traffic measurement would need to occur if overall inter-carrier minutes or distances are out of balance or if there

are different rates for local and toll traffic. Percentage of local usage may be an appropriate measurement method in the near term.

There are several options for dealing with inter-carrier compensation. The simplest is "bill and keep" or "mutual traffic exchange" in which carriers make no explicit charge for terminating local traffic that originates on other networks. This option works well when traffic flows are approximately balanced in terms of both minutes of use and distance traversed, and its administrative and monitoring costs are low. The absence of an explicit termination charge would promote competition for residential access customers, since requiring entrants to pay for termination on a per-minute basis could make it extremely difficult for them to offer competitive flat-rate local residential service, which is still the preferred option for residential customers where it is available. Indeed, entrants would find it difficult to compete unless the incumbent's own flat-rate service rates are high enough to include an imputed component for average local termination minutes.

The bill and keep option is useful as a short-term or interim solution as local competition begins, and it is also more consistent with maintenance of end-user flat-rate service than are explicit compensation schemes such as an "originating responsibility plan" under which the originating carrier would pay an access charge to the terminating carrier and bill the originating end user for termination. However, if a substantial imbalance in traffic flows persists between carriers, the bill and keep option might create distortions. This option also does not recognize the difference in costs that may arise when one carrier's network is ubiquitous and the other's is not. This option might also create incentives for carriers to engage in some "gaming" of the system. Such gaming could result in an entrant targeting business customers with a large volume of outbound local traffic relative to their inbound traffic. However, the multiple difficulties associated with setting compensation rates and the impetus building to get local access competition "up and running" result in this being an attractive option, at least initially.

If traffic flows are not relatively balanced, some method of compensating carriers with persistent net inflows may be required. Carriers could compensate each other for net terminations or termination minutes, or they could purchase flat-rate termination capacity on each others' networks. Mutual reciprocal compensation rates could be set either through negotiation among carriers or by state commissions. If the negotiation option is used, commissions should exercise oversight and monitor the process and outcome to ensure that bargaining was in good faith, that compensation was related to cost incurred, and that compensation was nondiscriminatory across carriers.

If explicit compensation is required, the easiest scheme sets a single rate or rates for all carriers. The rate should be based on the incumbent's TSLRIC for the functions used to transport, switch, and terminate calls. Alternatives include the use of benchmark cost or comparison price models to set a uniform termination rate for all carriers. The rate should also include some contribution component, thus it should be set

at TSLRIC plus some element of contribution. All eligible carriers would be able to charge for transportation, switching, and termination, and entrants should be allowed to purchase desired network functions on as unbundled a basis as feasible, i.e., to the extent feasible, entrants should be able to choose the point at which their traffic enters the incumbent's network. The incumbent may also be allowed to deaverage termination charges geographically if there is significant cost variation. Uniform termination rates for all carriers address the fact that a "customer monopoly" exists when a carrier has an end user as a customer. If entrants want to charge more than the incumbent, they must justify their charges with appropriate cost estimates, which must be reviewed and approved by the state commission.

With multiple providers, making the distinction between local and toll (intraLATA, interLATA intrastate, and interstate) traffic will be increasingly difficult. It may be necessary to use the incumbent local/toll distinction based on its local/toll areas.

Local termination rates should not be based on current IXC termination rates, as these are not cost-based and may include implicit support for universal service as well as relatively high contribution. Requiring local access providers to pay the current IXC access and termination rates would unduly inhibit local competition. One exception would require local carriers to pay the IXC termination rate if they are unable to monitor and distinguish between local and toll traffic they are terminating on other networks. The general expectation is that termination costs and hence charges for local and toll traffic will be similar if not identical in the long run. Any rate differences between local and toll termination rates should ultimately reflect only the different proportions of basic network functions (BNFs) used to provide local versus toll termination.

The remaining debate is how much overhead costs should be loaded on local termination rates. Overhead costs can be loaded in several ways, but generally take four forms. One option is to base the overhead allocation on revenue need and price elasticities. A second option uses straight-line overhead assessment based on total firm overhead. A third option uses a percent allocator based on the prior overhead level. A fourth option bases overhead recovery on the relative use of an input. The concern in all of these options is to weigh the need to recover legitimate costs of the firm against the desire to prevent "gouging" of essential services. Termination rates should bear only a proportionate share of overhead costs. If too many overhead costs are loaded on local termination rates, legitimate competition may be impeded. If significant rate differentials among classes of carriers exist, carriers may try to engage in rate arbitrage.

Another option involves the design of a two-tier scheme, with those carriers willing and able to undertake universal service and carrier of last resort obligations (as defined by the respective state PUCs) being allowed to charge more for termination than other carriers. A variant of this option would allow only those carriers with universal service, carrier of last resort, or essential service provider obligations to charge for

terminating local traffic. This option would allow continuance of universal service support, but it begs the question of whether access charges should be used to support universal service.

If local access providers are required to offer cheaper origination and termination rates to other local carriers than to IXCs, an untenable situation may develop, as IXCs will have incentives to engage in arbitrage between IXC access rates and local access rates. In the long run, it may make sense to equalize all access rates and remove the burden of funding universal service from IXC access rates. Until this is accomplished, however, PUCs will have to ensure that such arbitrage is minimized. Thus, local access providers should be required to pay IXC access charges for all IXC traffic that transits their networks. In other words, local access providers should not be allowed to terminate non-local traffic at local termination rates so long as a distinction is made between the termination rates for local, intraLATA, intrastate interLATA, and interstate traffic. A variation of this is to rely on percentage of local usage (PLU) studies, a sampling methodology, to determine the average termination rate to be applied between carriers. However, PLU studies take time and have to be updated periodically to limit strategic behavior by carriers.

If distinctions in rates between carriers and/or types of traffic are to remain in place, it is arguably necessary for all carriers to measure and sort the traffic which traverses their networks. Even if there are no rate distinctions among carriers, it may still be necessary to measure traffic patterns - in order to ensure that all carriers are in some way being compensated for the usage of their networks. One major concern associated with tracking traffic patterns is the expense and complexity associated with developing and using these mechanisms. If this expense is considerable, PLU reporting could be used to determine payments. The difficulties with PLU reporting are that PLU studies take time, have to be periodically updated and may need to be audited. Furthermore there will always be a true-up period that will occur when PLU ratios change. Another option is the use of flat rate ports. The use of flat rate ports may uneconomically inflate the originating carrier's expense to the extent that the terminating carrier would require dedicated ports be used to ensure that the different kinds of traffic are separated. A partitioning of the flat rate port could be employed to mitigate the economic expense, but again there is some uneconomic expense associated with this option. Actual usage tracking has the advantage of being a non-term, less distortable, more all-encompassing mechanism.

In addition to determining whether differing rates or differing rate applications between local exchange and other types of carriers or traffic are appropriate, there is also a question of whether "additive" type rates are appropriate. Examples of such a type of rate are the CCLC and the local exchange recovery portion of the RIC. The problem with the CCLC and RIC elements is that they are nontraffic sensitive charges and can be avoided.

Termination rates must evolve to reflect actual costs. It is not generally disputed that, if additive types of rates are to be levied, it is more equitable to assess them on all carriers and types of traffic, based on the concept that traffic should contribute to the local loop as a common input in the production of telecommunications services. To sanction discriminatory rate treatment between carriers or types of traffic is to advantage various players in the telecommunications markets. It distorts production costs and therefore may inadvertently foster uneconomic service providers. While the goal of advantaging new technologies or entrants in the short run can be appropriate, it must remain only a short term option.

In the end only low volume users of switched access services will be utilized as the recovery source for this "revenue requirement" - but only so long as they do not have service options. It may be possible to develop an element that can be applied to all minutes traversing the local network(s). This may require a mechanism that permits recovery from all carriers regardless of whether the LEC network is traversed, reassigns these elements to end users, or combines these options.

Having stated the foregoing principles, it is widely recognized that there is indeed discrimination in the application of termination rates and even "additive" rates between carriers and between different types of traffic. Such distinctions appear to be unrelated to actual cost differences in service provisioning. The reason for these distinctions have generally been twofold; to foster new technologies, and/or to encourage new carrier entrants. In the case of EAS the goal was to keep rates low while not generating a significant amount of "recovery" on the books, avoiding imputation problems, as well. In a competitive environment, with a multitude of providers and technologies involved in even a single phone call, it is questionable whether such distinctions, no matter how laudable the goal can be sustained in a competitive market involving multiple intermeshed networks.

4. Rates for Unbundled Essential Inputs

The cost of unbundling facilities, functions, and services should be recovered on a competitively neutral basis, barring extraordinary unbundling requests or costs. Rates should also reflect any legitimate volume discounts and other savings resulting from selling at wholesale rather than retail e.g., reduced marketing and billing costs. And in determining the rate for specific unbundled facilities, functions, and services, the LEC may deaverage its calculations to the extent appropriate.

Rates for the LEC's retail services that include unbundled facilities, functions, and services should be set at no less than the sum of the rates charged for each unbundled service plus the TSLRIC of any other

services bundled into the retail service, except as noted in Section V.F.2. This floor can be adjusted to reflect legitimate savings generated by bundling services together e.g., if the LEC has shown a cost resulting from unbundling, it need not include that cost in its calculations.

Entrants in the local access market will produce some services and functions for themselves and purchase other functions and services from the incumbent LEC. Some entrants will be facilities-based, but they will find it necessary to purchase bottleneck or essential services and functions (those which cannot easily be duplicated) from the incumbent. Other entrants will be nonfacilities-based resellers or repackagers, buying at wholesale and selling at retail, as are now present for both toll and cellular services. The extent to which the incumbent is required to unbundle its facilities, functions, and services and the method used to set rates that the incumbent charges its competitors will be two of the crucial factors that determine the viability of competitive entry. Thus, an important policy issue is how to find unbundling and pricing rules that do not create undue advantages for either the incumbent or its competitors. The incumbent should not be allowed to price services to other carriers so high as to foreclose efficient entry. Nor should the incumbent be required to unbundle and sell services at rates so low that a competitor is able to purchase unbundled pieces or functions of the incumbent's network, rebundle them, and resell them profitably at rates below the incumbent's own retail rates, unless the competitor operates more efficiently than the incumbent.

Incumbents and entrants should negotiate, or regulators should establish, arrangements for exchanging and sharing information and ensuring that all customers are able to access needed services. Incumbents may charge entrants for services provided, but such charges should be reasonable and not unduly inhibit competition.

5. Rate Averaging

Rate deaveraging should be permitted when selective competitive entry warrants such flexibility - subject to a TSLRIC floor constraint. There may also be non-competitive situations which warrant rate deaveraging. Such a situation may arise when a service has extremely wide cost variances in its provisioning and that averaging the rate may reduce subscription levels. Further, rate deaveraging could provide more accurate market signals.

In cases where deaveraging results in unacceptably high local rates, maintaining rate averaging in a competitive environment would require the development of an elaborate system of deaveraged rate support whereby an explicit subsidy would take the place of the implicit subsidy formed by averaging.

The advent of competition creates pressure to deaverage local rates to reflect underlying costs. However, the network benefits of at least maintaining existing penetration levels indicate that there may be instances where averaging or other forms of support may be appropriate. Rate averaging will probably not be sustainable in a competitive environment in the long run. Regulators should consider deaveraging based on market conditions. If new carriers are allowed to enter only relatively low cost to serve areas, then the market rates for these areas will fall. If new entrants are required to serve a broad area at an averaged rate, this may effectively block competitive entry and deny consumers in low cost areas the benefits of competition. The only way to sustain rate averaging in a competitive environment would be to construct an elaborate system of deaveraged rate support whereby an explicit subsidy would take the place of the implicit subsidy formed by averaging. In addition, the idea that consumers in low cost to serve areas should pay artificially high prices for telephone service when most other essential household expenses, such as food, housing, insurance, are allowed to vary according to the cost of serving various areas has little appeal to many consumers' sense of fairness.

6. Pricing of Rights of Way

All providers should be offered equivalent rates, terms, and conditions for obtaining access to rights of way facilities. The price for that access should be based on the incremental cost of providing that access, including the initial make-ready cost, which the entrant should be given the option of paying over a period of time, and an ongoing charge including a relative use-based share of the cost of maintaining the facilities and an appropriate allowance for a return on the incumbent's investment plus some contribution to the incumbent's joint and common costs based on relative use.

The rates, terms, and conditions for such access should be negotiated between the incumbent and the entrant(s) requesting access, but state commissions should maintain oversight authority to ensure that negotiations proceed in a timely manner, that the rates charged and technical standards imposed on entrants are not excessive, and that nondiscriminatory treatment is given to all authorized telecommunications service providers. Imputation tests applied to the incumbent's retail rates should include an allowance for the incumbent's use of rights of way.

Prices for access to rights of way should be similar to those charged for interconnection with other LEC facilities, i.e., based on TSLRIC plus some contribution to joint and common costs. Also, the incumbent's retail rates must pass an imputation test