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The Eligible Telecommunications Carrier: A Strategy for Expanding Universal Service

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Executive Summary

The Telecommunications Act of 1996 seeks to achieve two seemingly contradictory goals: the introduction of competition into all areas of telecommunications and the preservation of the universal service mandate. The Act resolves this apparent conflict by making competition an integral part of the universal service strategy. At the center of this strategy is a new type of service provider, the Eligible Telecommunications Carrier (ETC). ETCs will be designated by state commissions to provide basic services, on a competitive basis, to all subscribers in specific service areas, and to receive, in return, subsidy payments to help defray the cost of providing universal service.

The inclusion of competition in the provision of basic services poses many questions for state commissions as they designate these new universal service providers. This report, after reviewing the specific universal service and ETC provisions of the 1996 Act, examines many of the significant questions surrounding the ETC strategy articulated in the Act. Issues discussed include: potential *candidates* for ETC status; the role of the *incumbent* local exchange carrier; the impact of *service area* size and characteristics on potential ETCs; the *number* of viable ETCs that can be supported in a service area; the various methods which have been suggested for determining the *cost of universal service*; and the challenges posed by *rural* areas and the less-affluent *urban* regions.

New Powers

The 1996 Act places the responsibility on state regulatory commissions to designate multiple ETCs for nonrural local service areas and to establish universal service funds for state services. This responsibility is accompanied by specific powers that will allow states to control who may receive designated universal service monies at

both the state and federal levels. The "power of the universal service purse" is a powerful tool that can assist states in achieving their competition and universal service goals. As shown below in Table E-1 some of these specific powers include:

TABLE E-1
State ETC Powers

Power	Potential Impact
Designation of an ETC	May be in response to a request or on the Commission's (PUC)own motion. PUC can decide which incumbents and new entrants function as ETC and receive designated state and federal subsidies.
Define ETC service territories	Being an ETC can only occur in conjunction with a designated service area. The PUC can accept or modify a proposed service area, or even designate a new one in order to achieve universal service. As no ETC can function without a service territory, this ability to define service territories is a powerful regulatory tool.
Can control ETC exit from market	A designated ETC can not relinquish its ETC designation without PUC approval.
Decide the number of ETCs	Aside from the mandate to have more than one ETC in nonrural areas, the PUC is free to choose how many ETCs are necessary in a given area to achieve universal service goals. This decision has economic consequences that the PUC can use to achieve universal service goals.
Determine size of the state subsidy fund	Funding, costing, designation of what services are to be eligible, and level of funding are in the province of the PUC for state services and the resolution of these issues will have competitive consequences.

Source: Author's construct.

Need for More Than One ETC

Designating only one ETC network provider would have the effect of marginalizing basic services in a nonubiquitous, competitive environment. The benefits of competition would tend to flow to the economically attractive service areas and only the lowest-common-denominator basic network would be available to those areas served by only one ETC because of the intrinsic economic incentives inherent in monopolistic provisioning of ETC services. The creation of more than one ETC has the practical effects of including consumer choice in the definition of universal service and enhancing competition in high-end nonbasic services.

Size of Universal Service Fund

As shown in Table E-2, the impact of different costing approaches can affect the size of the universal service fund. If the ultimate goal is to decrease subsidies and push for the most efficient provisioning of universal service, then proxy models and standardized payments (regardless of the carrier or any other circumstance) may be the preferable approach. If the use of actual cost studies rather than proxy models provides larger subsidy payments, this will make ETC status a more economically attractive option to a wider range of candidate ETCs.

TABLE E-2

Relation of The Size of The Universal Service Fund And Alternative Costing Approaches

Alternative Costing Approaches	Resulting Fund Size	
	Larger Fund	Smaller Fund
1. Cost Model		
A. Use of Long-run Incremental Study		X
B. Use of Embedded-cost Study	X	
2. Network		
A. Use of a Proxy Model		X
B. Use of Actual ETC Network Configuration	X	
3. Service Territory		
A. Use of Large Service Area		X
B. Use of Small Service Area	X	
4. Cost basis		
A. Same Subsidy Payment for all ETCs		X
B. Subsidy Payment Based on ETC's Costs	X	

Source: Author's construct.

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Introduction

The Telecommunications Act of 1996 expresses a strong commitment to two seemingly conflicting goals: the introduction of full competition into all areas of telecommunications (including the local exchange), and the preservation and advancement of universal service. A commitment to free and open competition would seem to preclude an interest in assuring the ubiquitous provision of affordable, low-end basic services. In a purely competitive market, service providers are free to offer high-end services to affluent subscribers and to avoid offering basic services in high-cost and sparsely populated areas. If no providers step forward to offer low-end services or if rates for services in high-cost areas are too high to be affordable for the majority of subscribers, then this would be an understandable but unavoidable result of the free play of market forces.

A commitment to universal service, on the other hand, requires that provisions be made to assure that low-end services be available and that rates in high-cost areas remain affordable. Far from retreating from the universal service goals which policy makers have extrapolated from the language of the Communication Act of 1934, the 1996 Act articulates a surprisingly explicit commitment to universal service goals. Indeed, the legislation makes the attainment of affordable rates and quality basic services for rural and high-cost areas a legal mandate.

The 1996 Act articulates a surprisingly explicit commitment to universal service goals and makes competition an integral part of the universal service strategy.

The Telecommunications Act seeks to reconcile the preservation of universal service with a commitment to competition by crafting an innovative approach to the provision of universal service. Rather than treating competition as antithetical to universal service, the provisions of the Act make competition an integral part of the

universal service strategy. Central to this strategy is a new type of service provider, the Eligible Telecommunications Carrier (ETC). *The Act defines an ETC as a local exchange carrier that has been designated by a state commission to provide basic services, at affordable rates, to all subscribers in a specified service area; in other words, to provide universal service.* In return for providing these services, the ETC will receive subsidy payments from a central fund established to help defray the costs involved in providing universal service. Only ETCs will be allowed to receive such subsidy payments.[1]

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The ETC arrangement has many similarities to the traditional system of granting a local exchange carrier (LEC) a franchise in return for providing services to all subscribers within the franchised territory. State commissions have been granting such exclusive franchises for many decades, and have used this approach as a mechanism for assuring that subscribers are served. There is one striking difference in the ETC arrangement, however. ETCs will not receive an exclusive franchise. The 1996 Act requires state commissions to designate more than one ETC for every service area, except those areas served by small rural telephone companies. As a result, universal service is intended to occur through multiple, competitive providers.

The competitive provision of universal service is a profound departure from the traditional approach to universal service policy, which was predicated on a monopoly market structure. In return for an exclusive franchise, the monopoly service provider agreed to average rural and urban rates, to charge more for business lines than for residential lines, and to allocate a relatively large percentage of local loop costs to interstate toll rates in order to keep

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[1] 47 U.S.C. Section 214(e)(1) and (2).

residential local rates low, and therefore affordable. The funding of universal service was, as a result, accomplished through implicit subsidies and payment flows and through the monopoly provision of service.

Funding of universal service was accomplished through implicit subsidies and through the monopoly provision of service.

The Telecommunications Act of 1996 replaces this approach with an explicit process, separate from, and independent of, market structure. The Act specifies the creation of an explicit universal service fund, paid into by all telecommunications carriers, and disbursed to all universal service providers. Because universal service funding is to be a stand-alone process, it is not dependent upon the number, or type, of carriers paying into the fund, nor is it dependent upon the number of providers drawing payments out of the fund. By replacing an implicit subsidy scheme with a system in which the cost of universal service, the size of contributors' obligations, and the basis for subsidy payments are all explicit and defined, the 1996 Act has decoupled the funding of universal service from any specific market structure and has made it possible to address the provision of universal service in a competitive context.

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The 1996 Act has decoupled the funding of universal service from any specific market structure.

The establishment of an explicit funding mechanism is one important step toward the competitive provision of basic services. A more important step will be the designation of carriers, ETCs, to provide service. One benefit of the monopoly provision of universal service was its relative simplicity. The monopoly provider, in return for some constraints, had no competitors. The incentives and interests of the

monopoly provider were fairly clear. The incentives and interests of the ETC, in a competitive environment, may not be so simple to determine.

State Commission Responsibility for ETCs

The 1996 Act places the burden of populating the new competitive ETC landscape on the state commissions. The state commissions have the responsibility and authority to designate ETCs, either in response to a request or on their own motion.. State commissions define the area within which the ETC must provide service to all subscribers, and they have the authority to allow ETCs to relinquish that obligation. Perhaps even more importantly, state commissions decide how many ETCs can, or must, serve a specific service area. With the exclusive franchise, state commissions mandated a basic services monopoly. With the ETC provisions, state commissions will now mandate universal service competition.

The 1996 Act places the burden of populating the new competitive ETC landscape on state commissions.

The obligation to designate competing ETCs makes the job of the state commissions more complex. State commissions could designate one ETC per service area, and thus assure that subscribers in that service area have access to basic services. Many LECs would find that prospect attractive, especially if the subsidy payments for providing those basic services were adequate to cover costs. There are, however, distinct benefits to the competitive approach. Designating one network provider as an

Designating one network provider as an ETC would have the effect of marginalizing basic services in a competitive environment.

A network relegated to providing predominantly low-end services would not generate the resources needed to expand and grow.

ETC would have the effect of marginalizing basic services in a competitive environment. While the benefits of competition (increased efficiencies, customer choice, and innovation) would be allowed to flourish in the high-end services and in the more attractive service areas, these benefits would be less likely for the low-end subscribers and those in high-cost, sparsely populated areas. As a result, rather than assuring that customers receive basic services, state commissions would be assuring the existence of a least-common-denominator, basic network. In an era of increasingly sophisticated technologies and services, a network relegated to providing predominantly low-end services would not generate the resources needed to expand and grow. As a result, the disparity between a low-end network and the increasingly advanced networks would widen, a development which would be counter to the universal service commitment articulated in the 1996 Act.

The creation of more than one ETC per service area has the effect of expanding the definition of universal service to include customer choice and the other benefits of competition. It might also have the benefit of enhancing competition in high-end, non-basic services. Some new entrants may find it easier to establish a foothold in the local exchange market if they can expand their service reach to include basic services. The prospect of receiving subsidy payments for any basic services provided below cost might make such a move more attractive, and feasible.

The creation of more than one ETC per service area has the effect of expanding the definition of universal service to include customer choice and the other benefits of competition.

While there are benefits to a competitive ETC strategy, there are also a great many questions and complexities involved in this approach. State commissions in designating ETCs are operating in uncharted territory. In crafting an ETC strategy, state commissions must consider such matters as the position of the incumbent local exchange carrier (ILEC). The ILEC is the dominant carrier in the local

State commissions in designating ETCs are operating in uncharted territory.

market. The success of any non-ILEC ETC will depend, at least for the foreseeable future, on the ability to use ILEC facilities and services. While some ILECs may wish to serve as ETCs in all of their existing service areas, other ILECs may seek to relinquish ETC obligations in the more rural and high-cost portions of their current service territories. New entrant ETCs may wish to avoid serving high-cost rural areas and low-income urban areas. It is the responsibility of the state commissions to assure that these very areas, which ILECs and non-ILECs alike may wish to avoid, are served.

The success of any non-ILEC ETC will depend on the ability to use ILEC facilities and services.

The state commissions will have an important tool in assuring that ETCs serve less attractive areas; the 1996 Act gives the state commissions the authority to define ETC service areas. State commissions may be able to leverage this authority to assure that LECs seeking to serve as ETCs in affluent suburbs, also have to serve lower-income urban regions. The definition of service areas will not be a simple issue for state commissions, however. The size and composition of service areas will have an impact on the viability of some potential ETCs. Defining large service areas may discourage some new entrants; defining small service areas may drive the costs of universal service up by establishing a unit of service lacking in economies of scale. Requiring ILECs to continue to serve their existing territories will assure continued service to subscribers. Allowing competitive ETCs to serve only portions of ILEC territory may encourage competitive entry but may not be fair to the ILEC.

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Other significant issues underly the matter of service area. The service area will define the unit upon which the cost of universal service will be based.

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The smaller the unit, the higher the potential cost. The matter of how to determine cost is by no means clear; many questions arise regarding the appropriate costing methodology and cost basis which should be used. The ultimate answers to these questions will have an impact on the type of subsidy payments available to ETCs, and thus, an impact on the viability of the ETC strategy. The number of ETCs which a state commission should designate is also in question. The 1996 Act specifies that state commissions will name more than one ETC for every area which is not served by a small rural telephone company. The Act does not provide guidance regarding how many ETCs will fulfill this requirement. State commissions must determine how many ETCs can be viable in a service area. This determination will depend on many issues, including the size and characteristics of the service area.

The effect of the Telecommunications Act of 1996 is to disrupt the monopoly Public Switched Telecommunications Network (PSTN) which has been the vehicle for assuring the ubiquitous provision of basic services to all subscribers. In its place, the Act seeks to establish several networks and several providers. Rather than envisioning a system in which there is one large network-of-last-resort for low-end services and high-cost areas, and several niche networks for advanced services and affluent urban areas, the 1996 Act seeks to establish a system of more equal networks, each offering a range of services to a range of subscribers. Through this approach the legislation seeks to combine the two seemingly contradictory goals of encouraging competition while at the same time preserving the universal service obligation. The success of this approach rests on the ETC strategy. If viable Eligible Telecommunications Carriers emerge in all service

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If viable Eligible Telecommunications Carriers emerge in all service areas, the commitment to universal service in the United States will not only have been preserved, it will have been expanded.

areas, the commitment to universal service in the United States will not only have been preserved, it will have been expanded. There are obviously many questions involved in the designation of ETCs, questions which must be considered carefully if state commissions are to craft a successful ETC strategy. It is the purpose of this report to examine these questions and their implications.

Setting the Stage for 1996

Telecommunications policy makers in the United States have grappled, during the past three decades, with the question of how to harmonize competitive provision of telecommunications services with a strong commitment to universal service. The Comptroller General of the United States articulated the tension between these two goals in a 1979 report regarding domestic common carrier policy:

> Currently, the broad goals set forth in the Communications Act of 1934 have been distilled into one principal policy--to make communications services available to all people of the United States. This policy is referred to as the Universal Service Mandate. . . . The established carriers assert that FCC's decisions allowing competition threaten the policy goal's continued satisfaction.[2]

At the time of the Comptroller General's report, only Customer Premise Equipment and specialized private line services had been opened to competition. Established carriers (the Bell System and the independent telephone companies) were arguing that competition in these two areas "threaten[ed] the cross subsidy to basic exchange service, and, therefore, threaten[ed] to raise the cost of basic exchange service, contrary to the Universal Service Mandate."[3]

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[2] General Accounting Office, *Developing a Domestic Common Carrier Telecommunications Policy: What are the Issues?* Report to the Congress of the United States, CED-79-18, January 24, 1979, 15.

[3] Ibid., 17.

The established carriers were basing their arguments on a tradition of monopoly service provision which had facilitated an elaborate system of pricing strategies designed to keep rates for residential local exchange service low, and, therefore, affordable to the majority of subscribers. With one telecommunications system solely responsible for the provision of both local service and message toll--residential and business lines, and urban and rural--it was possible to apply value-of-service pricing and rate averaging across services. As a result, business line rates were priced much higher than residential rates; rural rates were based on the number of subscribers callable without a toll charge, rather than on underlying costs; and a disproportionately high percentage of local loop costs were allocated to interstate toll charges.[4] There was no clear incentive to match prices with underlying costs because costs were recovered in the aggregate by the providers of the monopoly telecommunications system. As the established carriers realized in 1979, the introduction of competition into any market segment threatened the effectiveness of the pricing strategy. Competition in a pivotal market segment like long distance service threatened the very existence of these pricing strategies.

There was no clear incentive to match prices with underlying costs because costs were recovered in the aggregate by the providers of the monopoly telecommunications system.

With the divestiture of AT&T, long distance and local services were no longer provided by the same entity. Further, with toll competition, several entities were now providing long distance services. The basis for the former monopoly pricing system was no longer in place. The FCC sought to cushion the potentially negative effects these changes might have on universal service provision through a series of measures designed to preserve some elements of price averaging and subsidy pricing. In one

[4] The percentage of local loop charges allocated to the interstate jurisdiction was capped at 85 percent because the formula used to determine this allocation could result in an allocation percentage well in excess of 100 percent, thus allowing a company to recover more than 100 percent of its loop costs from interstate toll. See Carol L. Weinhaus and Anthony G. Oettinger, *Behind the Telephone Debates* (Norwood, NJ: Ablex Publishing, 1988), 96.

policy initiative, the National Exchange Carrier Association (NECA) was created to oversee a nationally averaged carrier common line charge; and, in a second initiative, the Universal Service Fund (USF) was created to provide subsidy payments to LECs serving high-cost areas. Also, small, usually rural, LECs were allowed to allocate a higher percentage of local switching costs to interstate access charges. In its approach to long distance competition, the FCC attempted to balance the two goals of encouraging competition and fostering universal service. On the one hand, through its access charge regime and presubscription provisions, it promoted interexchange competition. On the other hand, through the pooled common line charge and the Universal Service Fund, the FCC hoped to maintain some semblance of the traditional pricing arrangements which had fostered universal service provision through low local rates.

Universal service measures were based on a very specific industry structure.

The FCC's universal service measures were based on a very specific industry structure. Long distance services were provided on a competitive basis by interexchange carriers (IXCs), and local service and exchange access were provided as monopoly services by LECs. LECs had the responsibility for providing the very basis of universal service: the connection to the network. IXCs, through access charges, helped defray the costs of that connection. Arrangements and responsibilities, though complex, were relatively clear. One LEC per service area provided the connection between the subscriber and the network; only one LEC per service area was able to receive access charges and support payments; only IXCs paid into the Universal Service Fund and other support arrangements.

The 1996 Telecommunications Act

The Telecommunications Act of 1996 fundamentally changes this industry structure, and, with it, existing arrangements and relationships. The 1996 Act mandates the opportunity for competition in all segments of telecommunications, including local service and exchange access. No longer will the connection between the subscriber and the network only be provided by a LEC holding an exclusive franchise granted by a state utilities commission. Eligibility for universal service support will no longer reside exclusively with the incumbent telephone companies. The Act is unambiguous in declaring a fully competitive approach to telecommunications. A major portion of the legislation creates a new Part II for Title II of the Communication Act of 1934 titled "Development of Competitive Markets." At the same time, the Act articulates a strong, detailed commitment to the "preservation and advancement of universal service."[5]

Eligibility for universal service support will no longer reside exclusively with the incumbent telephone companies.

Unlike the traditional monopolistic approach, which regarded competition as antithetical to universal service, the 1996 Act seeks to foster universal service within a competitive framework. The Act imposes this goal not just on the FCC, but also on the state commissions:

> Nothing in this section [regarding removal of barriers to entry] affects the authority of a State to impose, on a competitively neutral basis . . . requirements necessary to preserve and advance universal service, protect the public safety and welfare, ensure the continued quality of telecommunications services, and safeguard the rights of consumers.[6]

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[5] 47 U.S.C. Section 254(b).

[6] 47 U.S.C. Section 253(b).

Indeed, the Act does more than just allow the state commissions some freedom to impose requirements to advance universal service, it places a major share of the responsibility for assuring the continued provision of universal service with the state commissions. It is the state commissions which have the duty to designate and assure the existence of the new providers of universal service created by the Act: the eligible telecommunications carriers.

The ETC is the centerpiece of the 1996 Act's universal service policy.

In many ways the ETC is the centerpiece of the 1996 Act's universal service policy and its efforts to harmonize robust competition with a strong universal service mandate. The eligible carrier takes the place of the current universal service provider: the ILEC who provides universal service in exchange for an exclusive franchise. The Act envisions several ETCs, at least in urban areas, offering competitively provided universal service. Instead of LECs receiving universal service support resulting from price averaging and implicit subsidies, ETCs will receive explicit subsidies from a fund to which all telecommunications carriers have contributed on an equitable, nondiscriminatory, and competitively neutral basis. In order to receive those explicit subsidies, carriers must be designated as ETCs by the state commissions.

- *ETCs will receive explicit subsidies from a fund to which all telecommunications carriers have contributed.*
- *In order to receive explicit subsidies, carriers must be designated as ETCs by the state commissions.*

The framework envisioned by the 1996 Act seems clear, although the implementation of this vision will not be that simple. Many important questions must be answered and procedures created in order to implement the ETC approach. For example:

- What should be the basis for universal service support contributions?
- How should universal service support payments be determined? Should they be cost-based? Whose costs should they be based upon? What costs should be included?
- How should affordable service be determined?
- How many ETCs can realistically be supported in a service area? What actions should state commissions take to assure competitive ETCs for inner-city urban areas?
- Will there be competitive ETCs in rural areas? Will the ILEC emerge as the rural ETC by default?
- How should an ETC's service area be defined? Should the competitive ETCs be required to serve all of the ILEC's service territory? Should ILECs be allowed to relinquish ETC responsibilities in selected parts of their current service territories?

This report will examine these, and other, questions surrounding the role of the ETC, the ILEC, and the state commission in this new era of local competition. The success of the ETC approach in assuring the continuation and advancement of universal service will depend on how these questions are answered and what procedures are implemented. It is important to remember that the state commissions will play the crucial role in answering these universal service questions and crafting these procedures.

State commissions will play a crucial role in answering universal service questions and crafting procedures.

Common Carriage and the Obligation to Serve

Under the provisions of the 1996 Act, all telecommunications carriers will be considered common carriers in the provision of telecommunications services.[7] Common carrier status places some responsibilities upon these service providers, but does not automatically make them responsible for providing universal service. As Eli Noam has pointed out, "the 'universal service obligation', is the requirement of a carrier to reach every willing user and desired destination, wherever located, while common carriage refers to service obligations toward users *given* a physical plant."[8] According to Noam, the characteristics which define common carriers are that their service is regular, their customers are not readily predictable, they solicit business from the general public, and their responsibilities are defined by law and regulation.[9]

- *The universal service obligation is the requirement of a carrier to reach every willing user and desired destination.*
- *Common carriage refers to service obligations toward users given a physical plant.*

Within the context of telecommunications, common carriers have had the responsibility of charging just and reasonable rates and of providing service on a nondiscriminatory basis. Nothing in this context requires the common carrier to serve any specific area or any specific class of customers. Once an entity holds itself out to the public as offering specific services for hire, then the requirements of common carriage regarding just

Common carriers have had the responsibility of charging just and reasonable rates and of providing service on a nondiscriminatory basis.

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[7] 47 U.S.C. Section 153(a)(49).

[8] Eli Noam, "Beyond Liberalization II: The Impending Doom of Common Carriage," *Telecommunications Policy* 18, no. 6 (1994), 436.

[9] Ibid., 437-38.

prices and nondiscriminatory service pertain. If the entity does not hold itself out as providing service in a specific area, or for specific services, there is no common carriage under this conceptualization. As Noam expresses it, there are "service obligations toward users *given* a physical plant." In the absence of a physical plant, there are no obligations. The picture changes when the entity is required to provide that physical plant; then the issue of universal service arises.

An example of common carriage without universal service obligation is the situation of competitive long distance providers. While companies like Sprint and LCI may choose to offer originating long distance services in a geographical area, there are no requirements that these companies provide long distance service in any specific locations. In the move toward equal access in the latter half of the 1980's, long distance carriers chose the communities in which they would be placed on the presubscription ballots. Once these companies elected to provide service to an area, that is, held themselves out as offering services for hire, it was incumbent upon them to provide those services as a common carrier.[10]

An example of common carriage without universal service obligation is the situation of competitive long distance providers.

Telecommunications carriers who elect to be LECs may do so in areas of their own choosing.

This same situation will pertain with local competition. The provisions of the 1996 Act suggest that telecommunications carriers who elect to be LECs may do so in areas of their own choosing. It is only in the designation of ETCs that an entity other than the carrier makes that choice. The ETC is

The ETC is appointed by the state commissions to serve in specific areas.

[10] The position of AT&T was different from that of the competitive long distance providers. AT&T was not given the option of withdrawing as a long distance provider. In effect, AT&T assumed the status of Carrier of Last Resort. If no competitive carrier stepped forward to serve an area, AT&T was still there to provide originating long distance service.

appointed by the state commissions to serve in specific areas. As a result of state commission action, the ETC *must* serve the designated area. Non-ETC LECs can choose which areas they wish to serve. This distinction is key to the 1996 Act's plan for universal service provision.

The link between common carriage and universal service commitments has traditionally been the exclusive franchise. State commissions granted LECs an exclusive right to provide telephone service within a specified service area. The LEC, in return for this monopoly position, agreed to certain restrictions on pricing flexibility and earnings potential. The LEC also agreed to serve, as far as was feasible, all willing subscribers in the franchise territory and all geographical segments of the territory. Another limitation for the LEC was the right of market exit; the LEC could not abandon service without state commission approval.

The ETC franchise is not an exclusive one.

The ETC provisions of the Act in essence grant the state commissions the authority to give a carrier a franchise, complete with the obligation to serve and with limitations on market exit; the difference is that the ETC franchise is not an exclusive one. Indeed, the Act places a duty on the state commissions to designate more than one ETC in nonrural areas. Once the state commission designates a carrier as an ETC, that carrier must provide a specific list of services to all willing subscribers in all parts of the designated area. The Act allows the state commissions to designate an ETC in response to a request from a carrier, or upon its own motion. The ability of the state commission to act upon its own motion is significant, because it gives the state commission the authority to *require* a carrier to serve. This can be a powerful tool for state commissions to use in assuring the existence of carriers of last resort in all service areas.

The ability of the state commission to act upon its own motion is significant, because it gives the state commission the authority to require a carrier to serve.

The concept of a carrier of last resort (COLR) has emerged as an artifact of competition. In a monopoly environment, the holder of the exclusive franchise, as the only carrier, was, in effect, the COLR. In a competitive environment, carriers are free to avoid serving certain areas because they are high cost or to avoid offering certain services because they offer little profit. This can leave subscribers without service from any provider, especially customers in sparsely populated areas and customers seeking very basic services. The COLR preserves the vestiges of the former monopoly system by serving those customers that other carriers may not wish to serve. Indeed, in return for certain guarantees, a COLR is *required* to serve those customers. In the scheme outlined by the 1996 Act, the ETC is a COLR. The guarantees which the ETC receives in return for providing COLR service is the ability to receive subsidy payments for designated universal service offered below cost. The interesting wrinkle presented by the provisions of the Act is that there can be, indeed should be, more than one ETC, and thus more than one COLR, per service area. This raises some important considerations for those entrusted with designating ETCs.

The guarantees which the ETC receives in return for providing COLR service is the ability to receive subsidy payments for designated universal service offered below cost.

While it was easy to understand why a carrier might want to give up some freedoms in return for an exclusive franchise, it is not so clear what the incentives will be for a carrier to seek, or willingly accept, a nonexclusive designation as an ETC. This question is one which state commissions must consider carefully. What are the incentives involved, and how many ETCs can reasonably be expected to function in any service area?

It is not so clear what the incentives will be for a carrier to seek, or willingly accept, a nonexclusive designation as an eligible carrier.

The ILECs provided service to willing subscribers and high-cost geographic areas because they were able to recover the costs involved in providing such service.

That was an implicit part of the agreement involved in the exclusive franchise. In these new arrangements, it is difficult to imagine that carriers will step forward to become ETCs unless they can be assured of recovering the costs involved in providing some ubiquity of service, especially since their non-ETC competitors are not burdened by these costs. Much will therefore depend on the subsidy arrangements; they must provide the possibility of substantial cost recovery if they are to encourage the emergence of ETCs. ILECs gradually built out the facilities, or bought facilities, required to serve a specified territory. ETCs will be expected to provide service immediately. The extent of the service area required and the ease with which resale and access to the existing public network are made available will be important issues as well.[11]

Over the years, the LEC industry was able to build a system in which there are significant economies of scale and scope. LECs could configure networks based on large numbers, sizing transmission facilities and switching installations accordingly. LECs could also build upon a platform of basic services in developing more advanced offerings, like digital facilities and vertical services. New entrants could regard the ETC obligation as a base upon which to build their own economies of scale and scope. A competitive access provider (CAP), for example, with facilities in place to serve large business customers, would not find the prospect of providing basic services to subscribers in contiguous residential neighborhoods strategically attractive if the cost of providing those basic services exceeded the potential revenues involved. If ETC status would assure the CAP that the cost of providing basic services could be recovered through a universal service subsidy, the CAP would have a greater incentive to extend its facilities into the residential areas and

New entrants could regard the ETC obligation as a base upon which to build their own economies of scale and scope.

[11] These issues are discussed later in this analysis.

to expand its services to include low-end basic service. The result would be an expansion of the CAP's customer base, and an increase in the CAP's economies of scale and scope. The ability of new entrants to use the ETC obligation as a base upon which to grow would be affected by the number of ETCs which emerge, or are required to emerge, for a service area.

The Definition of Universal Service in the 1996 Act

The 1996 Act in its universal service provisions is surprisingly detailed and specific. It makes many of the basic assumptions and precepts which have been held about the universal service mandate into actual points of law. The Communications Act of 1934 offered a vague statement of principle, rather than a specifically defined set of objectives. The universal service mandate was derived from a statement in the 1934 Communication Act which merely said that there should be:

> . . . . interstate and foreign commerce in communication by wire and radio so as to make available, as far as possible, to all people of the United States, a rapid, efficient, Nationwide, and worldwide wire and radio communication service with adequate facilities at reasonable charges for the purpose of promoting safety of life and property . . . .[12]

Exactly what constituted "adequate facilities" was not articulated. Nor did the language mention the concept of affordable rates. The 1996 Act is much more explicit in articulating what should be included in universal service. The language of Section 151 is augmented by the 1996 Act to read:

> . . . . to make available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex, a rapid, efficient, Nationwide and worldwide wire and radio communication service . . . [13]

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[12] 47 U.S.C. Section 151.

[13] 47 U.S.C. Section 151, as amended.

The Act then makes part of U.S. law the principles which should form the basis for universal service policy:

> (1) QUALITY AND RATES--Quality services should be available at just, reasonable, and affordable rates.
>
> (2) ACCESS TO ADVANCED SERVICES--Access to advanced telecommunications and information services should be provided to all regions of the Nation.
>
> (3) ACCESS IN RURAL AND HIGH-COST AREAS--Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high-cost areas, should have access to telecommunications and information services, including interexchange services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas.[14]

The legislative language also explains that universal service is an evolving level of telecommunications services subject to periodic review by federal and state regulators and supported by Federal universal service support mechanisms. New telecommunications services are to be added to the definition only to the extent that they:

> (A) are essential to education, public health, or public safety;
>
> (B) have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers;
>
> (C) are deployed in public telecommunications networks by telecommunications carriers; and
>
> (D) are consistent with the public interest, convenience, and necessity.[15]

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[14] 47 U.S.C. Section 254(b).

[15] 47 U.S.C. Section 254(c)(1).

The 1996 Act makes explicit many of the principles of universal service which had been implicitly assumed by policy makers since the passage of the 1934 Communication Act. The purpose of such measures as the Universal Service Fund was to subsidize carriers in rural, insular, and high-cost areas. The complex system of value-of-service pricing was designed to keep residential rates low, and, by assumption, "affordable." In effect, the language of the Act strengthens the commitment to the universal service mandate by making it clear what "all the people of the United States" means in this context and what steps, including the creation of specific subsidies, are to be taken in accomplishing the universal service goal.

The 1996 Act makes explicit many of the principles of universal service which had been implicitly assumed by policy makers since the passage of the 1934 Communication Act.

It is significant that the 1996 Act, which mandates competition as the required industry structure for all aspects of telecommunications, also includes such explicit statements about universal service goals and principles. The legislation provides a specific plan to assure that traditionally held universal service principles continue to be pursued, regardless of the change in industry structure and market approach. Indeed, the legislation provides for a plan which does not depend on any specific market structure because it makes the funding and provision of universal service a separate process.

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After decades of tension between competition and universal service, the Act strives to formulate a framework in which both can exist successfully. Unlike the complex system of implicit subsidies which relied on a specific industry structure, this system of universal service provision will not depend upon who can or cannot provide

interLATA long distance or upon what type of providers will be defined as LECs in the future. Through federal legislation and state authority, funds collected from all telecommunication service providers will be disbursed to ETCs so that they can provide a specific list of services to subscribers at affordable rates, even if those subscribers reside in high-cost service areas.

The 1996 Act does not list specific elements which constitute universal service, stating only that the definition is an evolving one, and providing for a Federal-State Joint Board to determine what that definition should include. From all indications, the components of universal service, as the provisions if the 1996 Act are initially implemented, most likely will be the elements which are usually considered part of local exchange service, those services traditionally offered by LECs. The FCC, in the *Notice of Proposed Rulemaking* to establish the Joint Board, asked for comments regarding the inclusion of five basic core services in the universal service definition: voice grade access to the public switched network, with the ability to place and receive calls; touch tone service; single-party service; access to 911; and access to operator services.[16] At the state level, one state commission has defined universal service to include a residential single-party, voice-grade access line; touch tone dialing; access to relay service; access to operators and directory assistance; access to emergency services; availability of flat-rate service; access to all long distance carriers; a white page listing and a directory; blocking for Caller ID, Auto Callback, 900, 976-like service, and toll restriction blocking; and the ability to transmit data at a minimum baud rate of 9600.[17] Once the specific components are determined by the FCC and the Federal-State Joint Board, they will be subject to Federal universal service support mechanisms. These same components, as well as any state-specific elements, will also be subject to state support mechanisms if the individual state commissions choose to establish them.

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[16] "In the Matter of Federal-State Joint Board on Universal Service," *Notice of Proposed Rulemaking*, CC Docket 96-45, March 8, 1996, at 17.

[17] Public Utilities Commission of Ohio, "In the Matter of the Commission Investigation Relative to the Establishment of Local Exchange Competition and Other Competitive Issues," *Finding and Order*, Case No. 95-845-TP-COI, June 12, 1996, Appendix A, 57-58.

The Reasons for Competitive Provisioning of Universal Service

The 1996 Act sets forth a framework for competition in all areas of telecommunications, including universal service. It is evident why the legislation would mandate the designation of at least *one* ETC for each service area. An ETC ensures that all consumers, even those who cannot afford advanced services or those in high-cost service areas, have access to some basic level of service. It is not so clear why the Act specifies the designation of competitive ETCs. According to the Act, the state commissions are to designate more than one ETC in areas not served by a rural telephone company. The legislation envisions competition even in the provision of basic service, even though competition is not inherently necessary to the provision of universal service, however desirable it may be for other reasons.

There appears to be little window for price competition in universal service elements.

Basic services appear to be an unlikely candidate for ubiquitous competitive entry. In most instances, markets which offer high profit margins, low unit costs, and the potential for a large, affluent customer base are the most attractive to potential competitors. These characteristics are not ubiquitously distributed geographically. Nor do basic services appear to be a likely venue in which to realize the customary benefits of competition, which theoretically include increased customer choice, lower prices, and the introduction of advanced and innovative services. It does not seem likely that ETCs will compete significantly with one another on price. Unlike other competitive situations, the premise behind the ETC approach is that carriers agree to offer universal service elements at an "affordable" price regardless of the underlying cost, even if the cost is not covered by the price. There appears to be little window for price competition in universal service elements. There also appears to be little window for competition on innovative services, as the service offerings involved are predetermined. While the usual ingredients for competition do not appear to be in

place, the 1996 Act's provision requiring competition in ETC services may be one of its major policy strengths.

In the former monopoly system, a full (albeit limited) range of services were provided to a full range of subscribers. The monopoly provider provided low-end services in poor urban areas, high-end services in affluent areas, basic services for residential customers, and advanced services for business customers. With the introduction of competition, the natural tendency for non-ETC-designated competitors will be to target attractive niche markets, leaving the low-end services and high-cost areas to whatever carrier is forced, by default or by regulatory intervention, to serve that market.

- *The small number of ubiquitous providers effectively creates a seller's market.*
- *The large number of potential providers for large business users establishes a buyers' market.*

In the former monopoly service areas, the most attractive niche markets are large business users, who, though small in number, provide substantial revenues for advanced services, while the less attractive markets tend to be the large body of residential subscribers who purchase very basic services. The absence of an ETC provider could result in a market situation in which a large number of providers targets a small number of customers, while the vast majority of subscribers are faced with the choice of one provider, or perhaps no provider at all.

Visually, this situation can be captured as two pyramids, as shown in Figure 1, with one pyramid upright and the other inverted. The upright pyramid (the customer pyramid) has the large number of residential subscribers at its base and the few very large business users at its apex. The inverted provider pyramid represents the number of providers and rests on the one or two providers which serve all local residential customers, effectively creating a sellers' market. The large number of potential providers for large business users establishes a buyers' market. As Figure 1 suggests, the potential outcome of local competition could be a vast disparity between number of

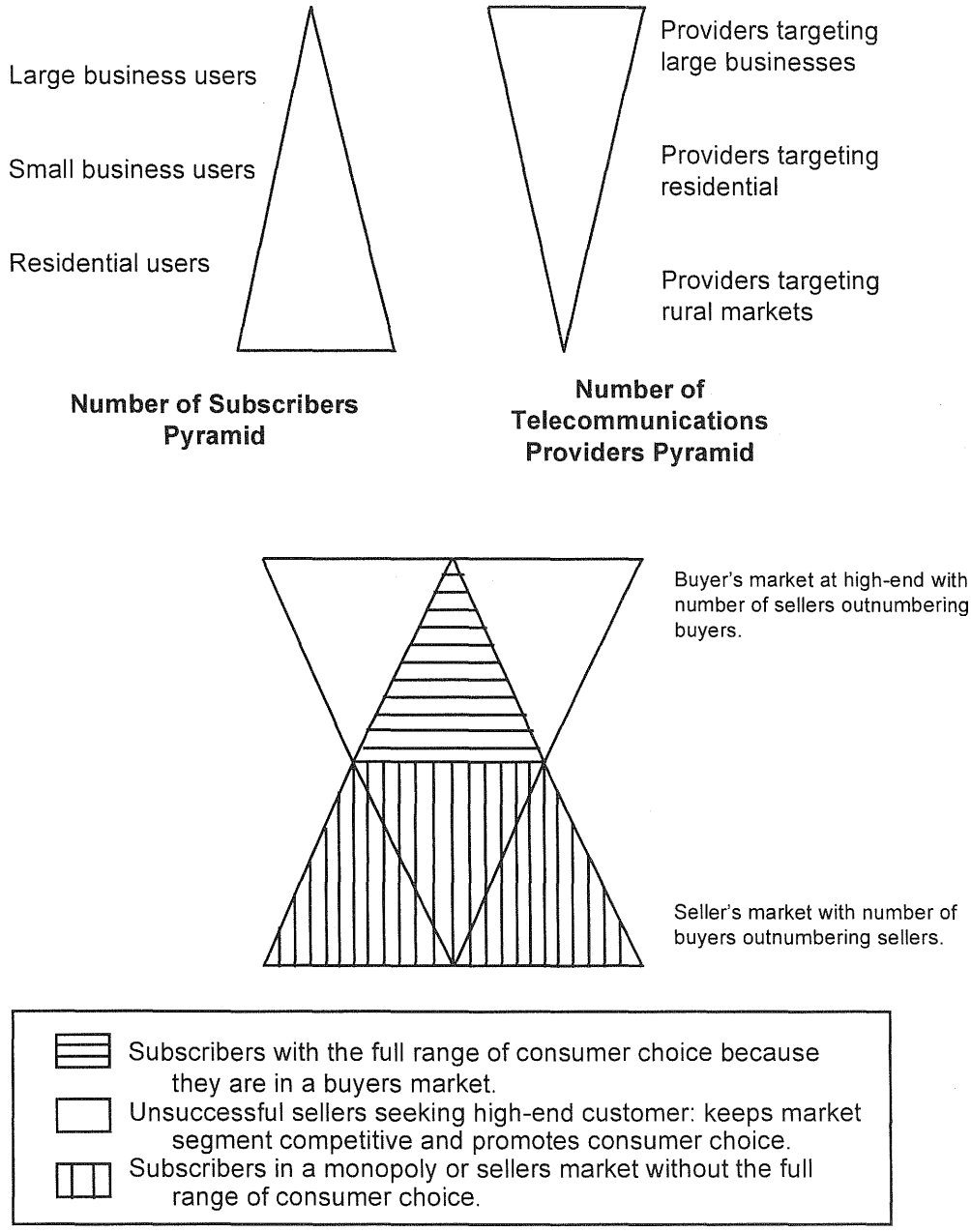

Figure 1: Mismatch of subscribers and providers in non-ETC monopoly markets and competitive markets.
Source: Author's construct.

customers desiring service and number of providers willing to provide services. If the two pyramids are superimposed, there are sizable shaded areas in which there are providers with "no customers" and customers with few providers.

As shown in Figure 2, the competitive ETC provisioning may fill in portions of this figure by providing more choice for the subscribers at the bottom of the customer pyramid and by providing more subscribers to providers seeking to serve the few customers at the top of the pyramid. Instead of an inverted pyramid, the provider figure becomes more rectangular, and there is a decrease in the size of the areas which, in Figure 1, represented customers with limited choice and providers with few customers. The shaded area in Figure 2 represents the expanded options for customers and providers. Residential subscribers are better off because of increased choice in a more buyer-oriented market. Potential providers may be better off as well because of an increase in their potential customer base at both ends of the two pyramids, and therefore their potential economies of scale and/or scope. The Act's promise of subsidy funding (where needed) for universal services offered at prices which are below cost is an added benefit to the potential providers.

Providing more choice for residential subscribers and more potential customers for new market entrants may not be without cost. It is not yet clear how large the universal service fund will have to be to support competitive ETCs; nor is it clear whether the economies of scale available from one universal service provider can be replicated in a multiple-provider environment. The social cost of not instituting a competitive ETC approach could be great as well, however. The result could be the creation of a two-tiered system in which there is one large, low-end network of last resort and several small, high-end networks of advanced technologies and innovative services. The carrier-of-last-resort network could find itself devoid of the resources to implement advanced services and technologies. Because universal service support payments are to be used only to

The carrier-of-last-resort network may not generate the resources needed for expansion and development.

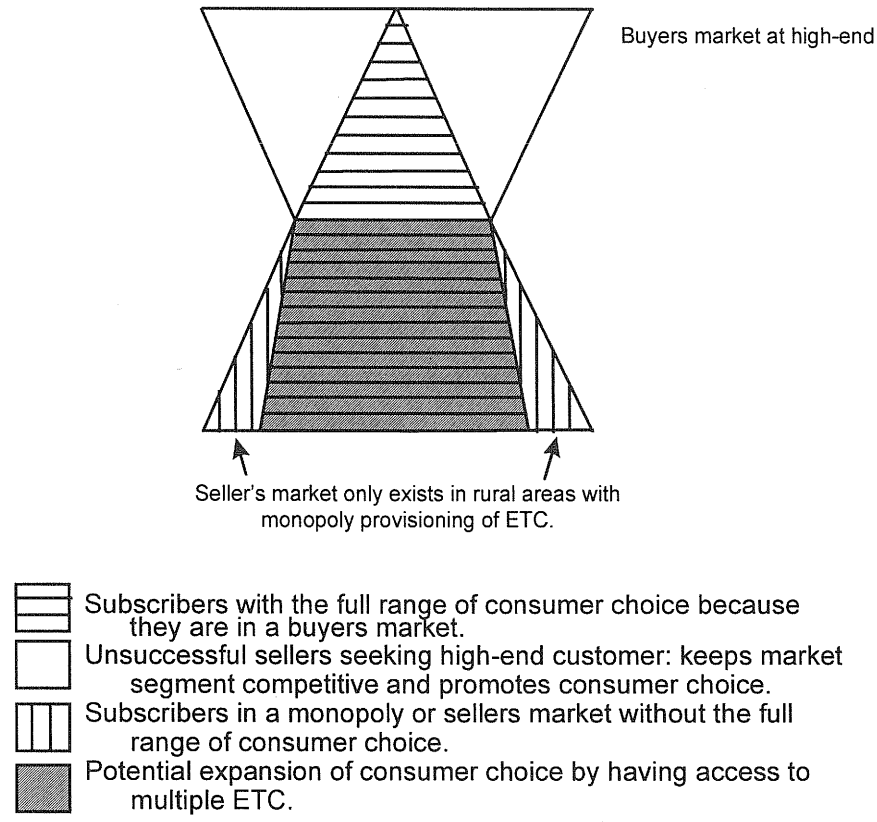

Figure 2: The effect of ETC provisioning in expanding consumer choice.
Source: Author's construct.

maintain and provide the basic list of universal service elements, the carrier-of-last-resort network, though receiving subsidy funding, would receive only enough funding to maintain a current level of technical development. As a result the carrier-of-last-resort network may not generate the resources needed for expansion and development. The potential situation of robust networks for "haves" and a technically inferior network for "have-nots" is counter to the stated goals of the 1996 Act regarding access to advanced services for all citizens.

The interconnection and unbundling provisions of the 1996 Act provide local competitors with the opportunity to share in the ILECs' economies of scope and scale. The ILECs' economies of scale and scope were developed across the whole public switched network, including low-end customers and high-cost areas. There is a certain equity in requiring competitors to serve all segments of that network, including the less competitively attractive segments. The former monopoly system produced a ubiquitous public switched network (PSN). The new competitive environment will replace this ubiquitous PSN with a "network of networks." In the short term, that network of networks will consist of a large ILEC network and several smaller competitive networks. The competitive ETC requirement provides one mechanism for changing that picture to one of several robust networks, more equal in size and in extent of services, and all of them available to a wide range of subscribers.

The ETC Strategy in the 1996 Act

The vehicle for providing the universal service elements will be a specific type of local exchange service provider, an ETC. The 1996 Act defines the ETC as a common carrier who will:

> (A) offer the services that are supported by Federal universal service support mechanisms under section 254(c), either using its own facilities, or a combination of its own facilities and resale of another carrier's services (including the

services offered by another eligible telecommunications carrier); and

(B) advertise the availability of such services and the charges therefor using media of general distribution.[18]

A state commission will designate a common carrier as an ETC once that carrier has demonstrated the ability to provide the elements which comprise universal service.

A carrier is designated as an ETC by a state commission, which "shall upon its own motion or upon request designate a common carrier that meets the requirements of paragraph (1) as an eligible carrier for a service area designated by the state commission."[19] In other words, a state commission will designate a common carrier as an ETC once that carrier has demonstrated the ability to provide the elements which comprise universal service to customers within a specified service area and the willingness to advertise the availability of these service elements. The state commission *may* designate more than one ETC for an area served by a rural telephone company and "*shall*, in the case of all other areas, designate more than one common carrier as an eligible telecommunications carrier for a service area designated by the state commission."[20] It is the state commission which defines the service area for the ETC. As the Act states, "[t]he term 'service area' means a geographic area established by a state commission for the purpose of determining universal service obligations and support mechanisms.[21]

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[18] 47 U.S.C. Section 214(e)(1).

[19] 47 U.S.C. Section 214(e)(2).

[20] Ibid., emphasis added.

[21] 47 U.S.C. Section 214(e)(5). The language of this section also specifies that the service area for rural telephone companies will remain their current study area, pending further action by a Federal-State Joint Board.

The Act grants the state commission the right to order a common carrier to assume ETC status for an unserved area, "with respect to intrastate services." The FCC has the right to order a common carrier to act as an ETC in an unserved area "with respect to interstate services."[22] Since most of the services required of an ETC constitute the basics of local exchange service, it can be assumed that the state commissions will play a more prominent role in designating ETCs for unserved areas, at least until the definition of universal service is expanded to include services more "interstate" in nature. The state commission also has the authority to allow an ETC to relinquish its ETC designation and responsibilities, but only in those service areas served by more than one ETC. It is up to the state commission to assess how the customers of the relinquishing ETC will be served by the remaining eligible carriers.[23]

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It is fitting that the state commissions are given oversight over the ETCs, since it has been the state commission, through use of the exclusive franchise, which has been responsible for assuring that subscribers receive local basic services. The LEC industry, which engaged in Federal universal service funding mechanisms like pooled carrier common line rates and the Universal Service Fund, ultimately was granted authority to provide service by the state commissions. The 1996 Act while appearing to change that relationship, may actually leave the foundation of that relationship in place.

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[22] 47 U.S.C. Section 214(e)(3).

[23] 47 U.S.C. Section 214(e)(4).

The state commissions will no longer be able to grant the ILEC industry an exclusive franchise; however, no exchange carrier will be able to receive Federal universal service support without state commission approval. This provision leaves the state commissions with a good deal of authority in its dealings with potential ETCs, and with the potential for attaching conditions to its granting, or removal, of ETC status. The Federal legislation merely injects an element of competition into an existing arrangement.

No exchange carrier will be able to receive Federal universal service support without state commission approval.

Candidates for ETC Status

The Act specifies that the state commissions shall designate more than one ETC for nonrural areas and may designate more than one ETC for rural areas. An obvious question is: what entities are most likely to either step forward to seek ETC status, or to be selected by the state commissions on their own motion to serve as ETCs?

What entities are most likely to either step forward to seek ETC status?

It may be important for state commissions to realize that the potential ETCs will not have the level of expertise and experience in providing universal service which the state commissions, and subscribers, have come to expect from the ILECs. Indeed, state commissions have established service quality standards for ILECs which have been based on assumptions about the availability of service vehicles, technicians, trouble reporting systems, billing and rating programs, and customer service representatives.

Potential ETCs will not have the level of expertise and experience in providing universal service which the state commissions, and subscribers, have come to expect from the ILECs.

It is unlikely that the potential ETCs will have in place the same level of resources as the ILECs have, at least at first. Nor is it likely that potential ETCs will be totally devoid of expertise or experience in providing service or customer support. Most potential ETCs will have expertise in some service aspects and will have to develop resources in others in order to provide a service level analogous to that offered as part of current basic service. Those providers which have a large customer base, like cable companies and electric companies, have experience with extensive billing databases and have fleets of service vehicles. Cable companies and electric companies, however, may not be proficient in detailed billing; cable companies may not have service vehicles and technicians adequate to meet the installation and service restoration schedules required by current telephone service quality standards. CAPs have experience with providing telecommunication service to large business customers, but may not have the personnel in place to serve large numbers of residential customers. In Table 1, several examples are shown of the kinds of resources an ETC candidate must have in order to provide a reliable quality of service.

If ILECs are designated as ETCs and are required to meet high standards of service quality, competing ETCs will have to match those standards or lose customers.

The issue of service quality standards is one which state commissions should consider in designating ETCs. Requiring ETCs to meet the same service quality standards as those which have been applied to ILECs may discourage some potential ETCs, at least in the short term, because of the investment and staffing involved. Lowering service quality standards to encourage competition would, however, be counter to the spirit and intent of the 1996 Act.

TABLE 1
Illustrative Service Quality and Resource Requirements

Service Quality Element	Resource Requirement
Detailed billing	Rating and billing programs
Installation schedule	Technicians, service vehicles, scheduling programs
Service Restoration	Trouble reporting system, technicians, service vehicles
Complaint process	Customer service personnel and procedures
Dialtone response	Monitoring and restoration programs
Operator response	Operator service facilities

Source: Author's construct.

The Act specifies the provision of quality service; moreover, the introduction of competition into universal service should theoretically enhance service quality. If ILECs are designated as ETCs and are required to meet high standards of service quality, competing ETCs will have to match those standards or lose customers. If service quality requirements for LECs are lowered, all ETCs, including the ILECs, will strive for a lower quality of service. Competing ETCs will have access to the ILECs' networks and will be able to resell the incumbents' services; this should make it easier for new entrants to meet service quality standards. This also provides another reason for maintaining high service quality standards for the ILECs.

Competing ETCs will have access to the ILECs' networks and will be able to resell the incumbents' services; this should make it easier for new entrants to meet service quality standards.

Another question regarding potential ETCs involves the manner in which service will be provided. Will ETCs be facilities-based carriers, or carriers providing service largely through resale. The language of the 1996 Act specifies that ETCs will provide

service through their own facilities, or through a combination of their own facilities and resale of other carriers' services. This language seems to preclude the possibility of an ETC discharging its duties solely through resale. The language does not, however, require any set percentage of service which must be provided through an ETC's own facilities. ETCs could conceivably have one switch in an ILEC's territory, could purchase some unbundled network elements from the incumbent to serve the area surrounding that switch, and could serve the rest of the incumbent's territory through resale. A state commission could consider that adequate provision of universal service. On the other hand, a state commission could require that an ETC with a service area encompassing several of an incumbent's wire centers have facilities in place in each wire center in order to qualify as an ETC. This appears to be another area in which much depends on the discretion of the state commission in designating an ETC.

The language of the Act appears to preclude the possibility of an ETC which provides service solely through resale.

Since the language of the Act appears to preclude the possibility of an ETC which provides service solely through resale, it is safe to assume that potential ETCs should, to some extent, be facilities based. Given this assumption, several candidates emerge. One prominent such candidate is the ILEC. The ILECs already, for the most part, provide the elements of universal service, through the use of their own facilities, to, in aggregate, 94 percent of the households in the nation. They have been the recipients of existing universal service support mechanisms and have a strong vested interest in continuing to receive support and in continuing to provide service.

Another potential category of candidates for ETC status are the IXCs because they already have a base upon which to build. IXCs have points of presence (POP) and interexchange facilities in ILEC service areas. They also have a subscriber base of customers who use their long distance services and think of them as part of "the phone company," especially AT&T. For many subscribers, receiving both their long distance and local service from an MCI or an AT&T could be seen as a sensible convenience.

The provisions of the 1996 Act would make it possible for an IXC to offer local exchange service, including universal service elements, without having to build significant new facilities. The 1996 Act requires all LECs to allow resale of their services, and expresses that duty even more forcefully in regard to ILECs.[24] The Act also requires ILECs to provide unbundled access to "network elements" needed to provide telecommunications service. These resale and unbundled access provisions pave the way for IXCs to change the flow of service they have been accustomed to providing their customers.

The current picture of IXC service provision can be expressed, in simplified fashion, in Figure 3. The trunk lines connecting the POP switch may or may not be IXC-owned, but they serve exclusively as delivery mechanisms for the initiation or termination of interexchange calls. As shown in Figure 4, IXCs might build out trunk or loop facilities to large customers or to densely populated segments of a service area and bring those facilities into their own switching location. For the rest of the subscribers in the service area, the IXC could resell ILEC local service using a hybrid of their facilities and those of the ILEC.

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IXCs might find it more attractive to limit their local service provision to densely populated areas, or to large business customers, rather than to assume the responsibilities of providing basic services to all customers in a designated area. Their decisions, as will be discussed later in this study, would be influenced by the service area requirements and the subsidy approach taken as part of the ETC arrangements.

[24] 47 U.S.C. Section 251(b)(1) and (c)(4).

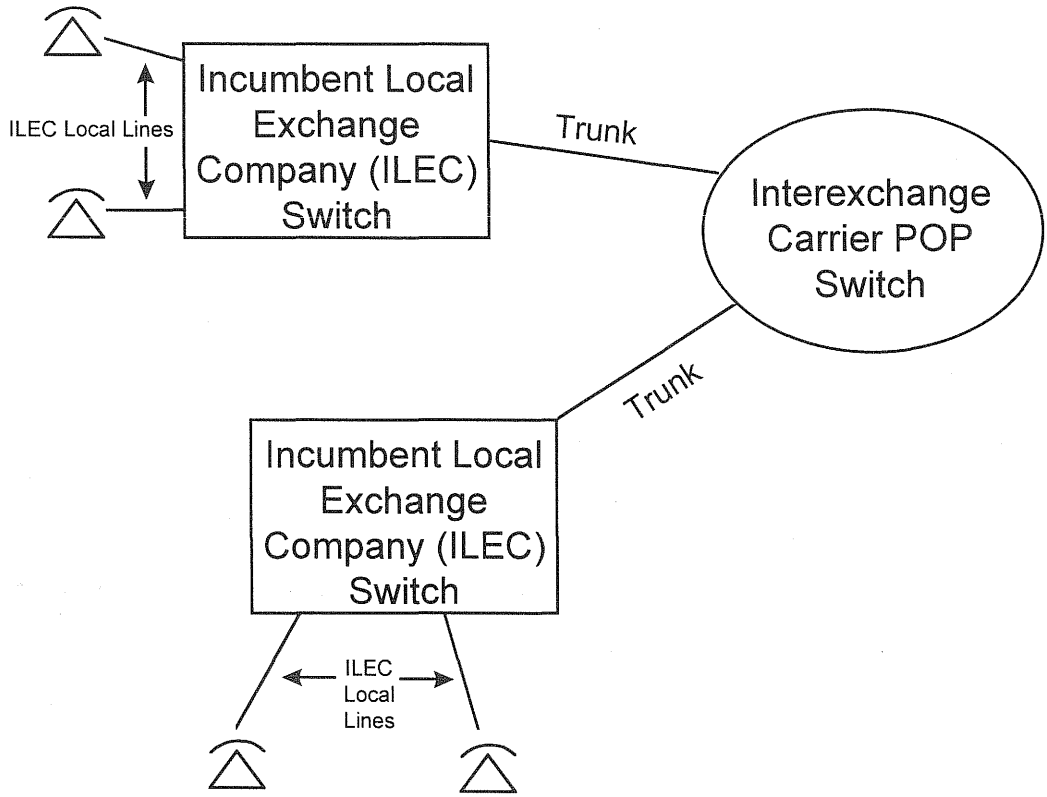

Figure 3: Current Interexchange Carrier (IXC) Configuration.
Source: Author's construct.

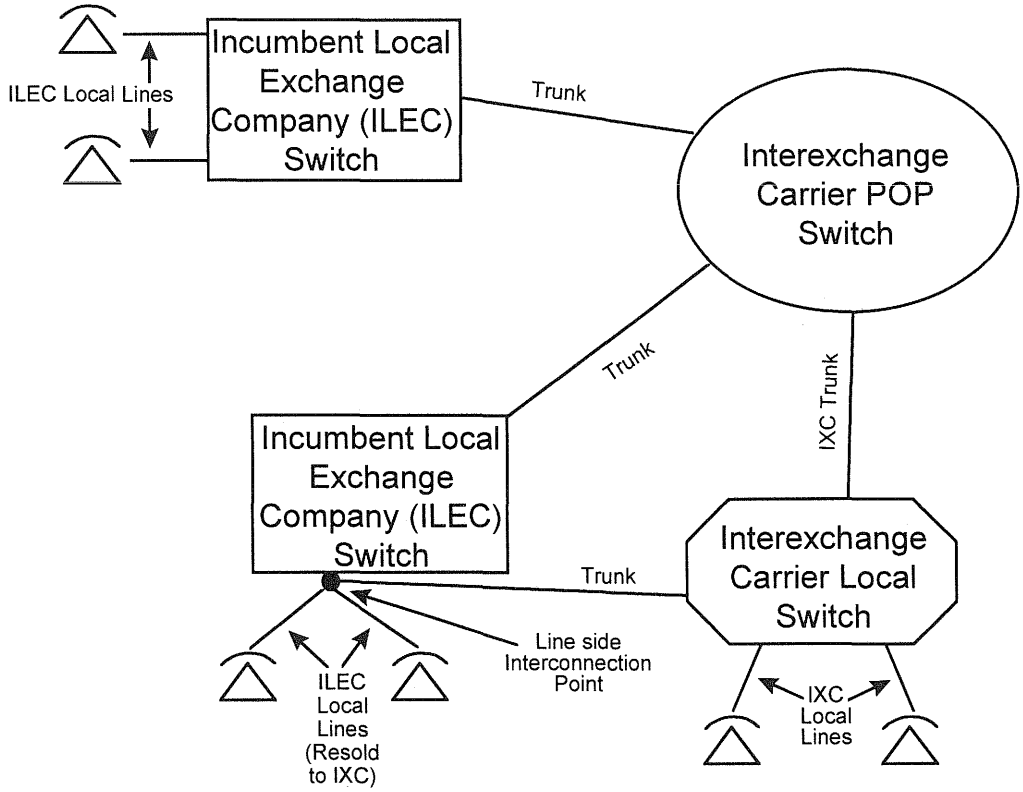

Figure 4: Interexchange carrier as a provider of local exchange services. Source: Author's construct.

Other candidates for the ETC designation include CAPs and cable television companies, both of which have facilities in place from which to expand their services. Like IXCs, CAPs already have facilities in place within ILEC service areas. Indeed, unlike IXCs, they have functioned very much like LECs, but they have tended to do so mostly for business customers and in areas with heavy business concentration. They lack loop plant and switching facilities in residential areas. The resale and access provisions of the 1996 Act could provide them the means for expanding their service reach without having to build ubiquitous loop and local switching facilities right away. A possible configuration is shown in Figure 5. Whether their reach would be expanded sufficiently for them to qualify as ETCs would, as with the IXCs, depend on the specifics of the requirements and arrangements surrounding the provision of ETC services.

Cable television companies could emerge as strong contenders for ETC status. The development of cable modems, or other technologies capable of separating the use of the wire into the home between video entertainment and voice/data communications, could provide cable television companies with an effective platform for universal service provision. Unlike IXCs and CAPs, cable companies already have facilities in subscribers' homes. With the addition of local switching facilities and by taking advantage of the unbundled access provisions of the Act, cable companies could function as viable ETC providers. The ability to turn to a universal service funding mechanism to help defray the cost of offering basic services would help minimize the cable companies' risk of expanding their networks and offerings. One possible cable television configuration is shown in Figure 6.

There are other entities which could emerge as ETCs. Electric utilities, which already have facilities in place for meter reading and internal-company communications, could decide to expand into telecommunications service provision and perhaps into

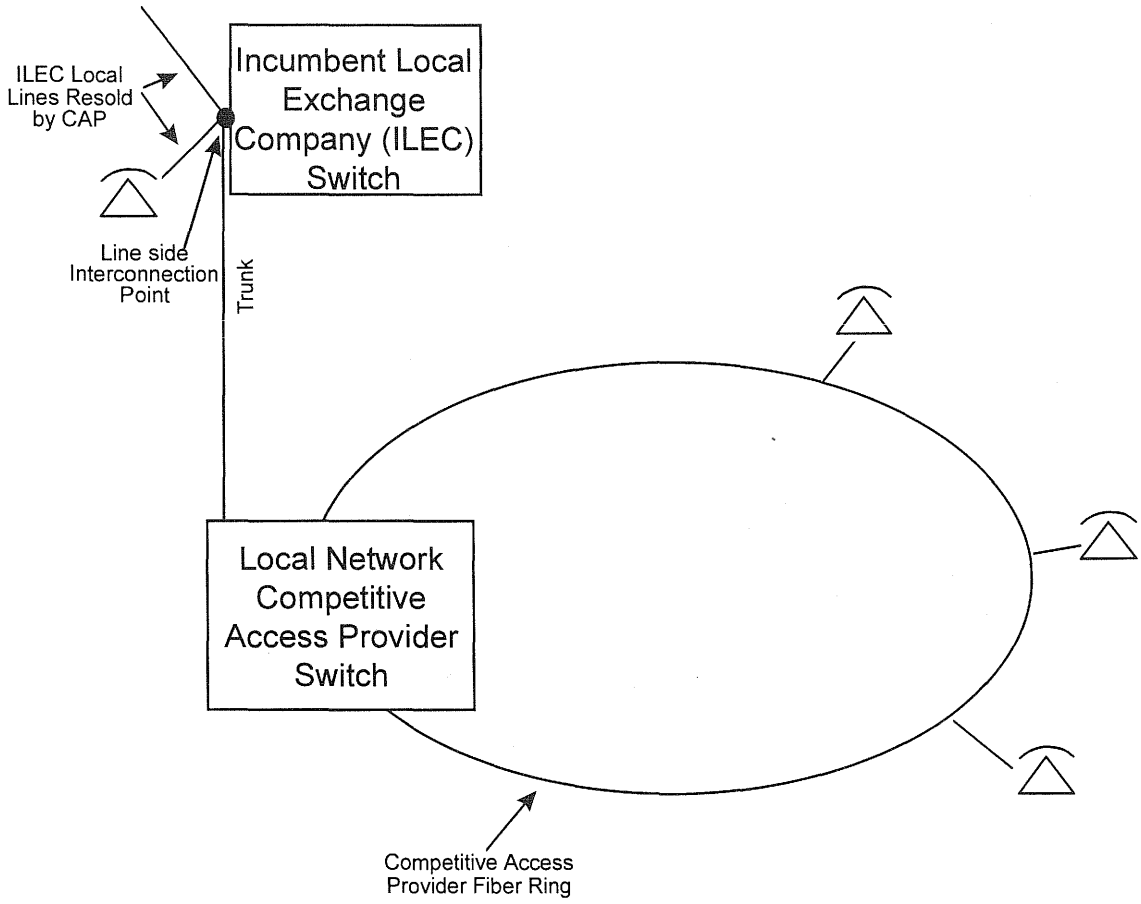

Figure 5: Possible Competitive Access Provider (CAP) configuration for the provisioning of local exchange services.
Source: Author's construct.

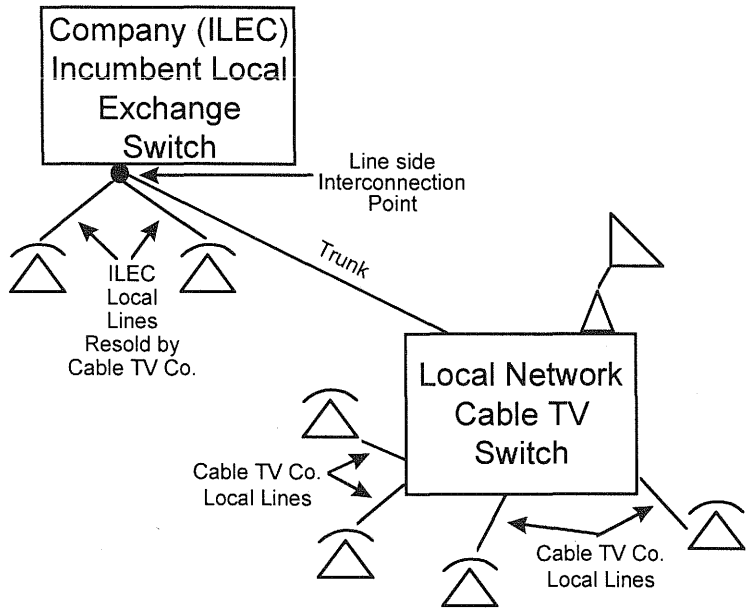

Figure 6: Possible cable television configurations for the provisioning of local exchange services.
Source: Author's construct.

ETC services.[25] Wireless providers could eventually emerge as providers of universal service, but their status in the 1996 Act is not clear. The Act appears to exclude them from the definition of local exchange carrier.[26] Other companies may emerge as well, though it is difficult to envision an entity stepping forward to provide universal service unless that entity already has, or has reason to build, facilities of its own. Unless the subsidy level and the service area requirements surrounding ETC status are such that they make the construction of facilities economically attractive, a potential ETC is more likely to already have facilities in place or to have plans to build facilities in order to serve a significant large business customer or a densely populated service area.

The Role of the ILEC

The 1996 Act seeks to make use of these embedded ILEC facilities and services in its framework for competitive universal service provision.

It is clear that the ILEC plays a significant and unique role in the provision of ETC services. The ILECs have served as the traditional universal service providers. They have loop plant, local switching, and interoffice facilities already in place. They provide directory

[25] Indeed, the American Public Power Association, in its reply comments in the FCC's universal service proceeding (Federal-State Joint Board on Universal Service, *Notice of Proposed Rulemaking and Order Establishing Joint Board*, CC Docket 96-45, FCC 96-93, March 8, 1996), urged that electric utilities be eligible for ETC status.

[26] 47 U.S.C. Section 153(a)(44) reads "The term 'local exchange carrier' means any person that is engaged in the provision of telephone exchange service or exchange access. Such term does not include a person insofar as such person is engaged in the provision of a commercial mobile service under section 332(c), except to the extent that the Commission [FCC] finds that such service should be included in the definition of such term." Also, the RBOCs, in showing that they have effectively engaged in interconnection arrangements with other local exchange providers, are precluded from including cellular providers. (See 47 U.S.C. Section 271(c)(1)(A)). The FCC's recent interconnection order confirms that commercial mobile radio service (CMRS) providers are not to be considered LECs. See, In the Matter of the Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 (CC Docket No. 96-98), and Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers (CC Docket No. 95-185), *First Report and Order*, FCC 96-325, August 8, 1996, at paragraph 34.

assistance and other operators; they print white page directories; they are involved in 911 and E911 service provision. The 1996 Act seeks to make use of these embedded ILEC facilities and services in its framework for competitive universal service provision. This is a necessary step if competitive ETC service provision is to take place. It is almost impossible to envision local service providers building facilities totally parallel and equal to ILEC facilities in the foreseeable future. The cellular companies come closest in accomplishing this feat, but even they are dependent upon ILEC facilities to provide some of the features (and most of the ubiquity) associated with universal service; and, as has been mentioned, their potential status as a LEC is unclear in the legislation. If viable alternatives to the ILEC are to emerge as ETCs, it will be because they are given access to ILEC facilities and services.[27]

The role of the ILEC in this context is similar to that played by the focal point network provider in a regulatory model examined by this author in another study which discussed the feasibility of a network of networks approach for telecommunications regulation.[28] In that study, a Linchpin Network model was analyzed. In the Linchpin Network one of the entities serves as a focal point network to which all other networks are connected, and upon which all other networks rely for specific services. In the Linchpin Network model, the focal point network provider serves a dual role as service provider to its own customers and also as service provider to its own competitors. The primary concern of regulators in the Linchpin Network

In the Linchpin Network one of the entities serves as a focal point network to which all other networks are connected.

[27] The FCC's interconnection order recognizes this fact when it observes, "the incumbent LECs have economies of density, connectivity, and scale; traditionally, these have been viewed as creating a natural monopoly. As we pointed out in our NPRM, the local competition provisions of the Act require that these economies be shared with entrants." See *First Report and Order*, FCC 96-325, at paragraph 11.

[28] See Phyllis Bernt, *Regulatory Implications of Alternative Network Models for the Provision of Telecommunications Services*, Occasional Paper #19, NRRI 94-29 (Columbus, OH: The National Regulatory Research Institute, October 1994).

model is to assure that the focal point network provider does not limit competition by taking advantage of its dominant position.

The role of the ILEC in relation to other local service providers is shown in Figure 7. This model allows for simple interconnection among all of the potential local service providers, even if these providers are not ETCs. The non-ILEC network providers in this model may or may not be connected to one another, but they all are connected to the ILEC. They have to be because the majority of telephone numbers which their own customers will wish to reach will, for the foreseeable future, belong to ILEC customers. In order to provide local service, they will have to interconnect to the ILEC in order to terminate their own customers' traffic and also to receive traffic from the ILEC's customers. The non-ILEC providers may be interconnected with one another as well, in order to terminate or accumulate traffic from one another's customers. Alternatively, the non-ILECs may arrange to deliver traffic to the ILEC, who would then route the calls to their ultimate destination.

If this basic model accurately describes local exchange competitive provisioning in general, it certainly depicts the competitive provisioning of universal service. If the non-ILECs are also ETCs, their connection to the ILEC will entail much more than the simple exchange of traffic, because the ILEC will supply the ETCs with the various elements which constitute universal service, and which the ETC itself cannot at this point provide. In this context, it is crucial that the dominant position of the ILEC be recognized, and that efforts be made to assure that the competitive providers receive the needed access to ILEC facilities at appropriate rates and under appropriate conditions.

The distinctions drawn in the 1996 Act between new LECs and ILECs suggests that the writers of the legislation recognized the ILEC's status as a focal point service provider. Tacit recognition of this status is reflected by the asymmetrical interconnection requirements in the Act.

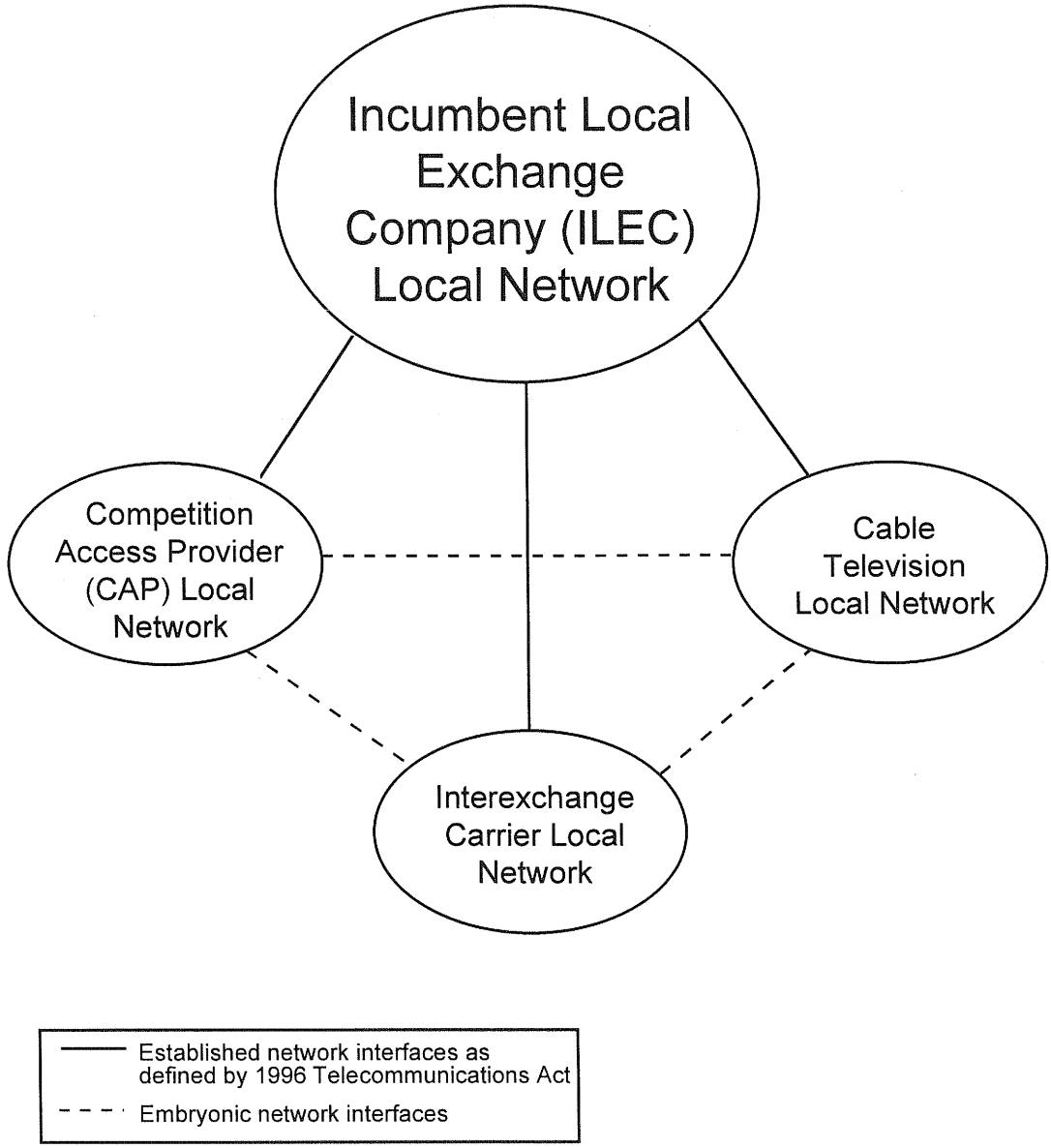

Figure 7: Linchpin Network Model of Local Exchange Services.
Source: Author's construct.

The ILECs are required to provide interconnection for other LECs; competing LECs are not required to provide interconnection to the ILECs or to one another. According to the 1996 Act, all LECs have a duty to allow resale of their services, to provide number portability to the extent feasible, to provide dialing parity, to afford their competitors access to rights-of-way, and to establish reciprocal compensation arrangements for the transport and termination of traffic.[29] The ILECs, however, have added obligations:

ILECs are required to provide interconnection for other LECs; competing LECs are not required to provide interconnection to the ILECs or to one another.

- An obligation to negotiate in good faith in establishing terms and conditions regarding number portability, dialing parity, access to rights-of-way, and compensation arrangements;
- To provide interconnection for its competitors' facilities which is equal in quality to what it provides for its own facilities and which is offered at just and reasonable rates;
- To provide access to its network elements on an unbundled basis at just and reasonable rates;
- To offer its retail services at wholesale rates to other telecommunications carriers;
- To provide reasonable public notice of changes in its transmission and routing; and
- To provide collocation on just, reasonable, and nondiscriminatory terms.[30]

[29] 47 U.S.C. Section 251(b)(1)-(5).

[30] 47 U.S.C. Section 25(c)(1)-(6).

Such arrangements with ILECs are necessary for any significant local competition, much less competition in universal service, to develop.[31]

In effect, the ILEC is a carrier's carrier.

In this competitive ETC model, the ILEC position is unique in another manner. In effect, the ILEC is a carrier's carrier. Other LECs, and certainly other ETCs, will be dependent upon the ILEC for access to loop plant, switching, databases, white page directories, and operators in order to provide service. This circumstance would seem to place an added responsibility upon the ILEC, which, in a sense, will function as a Carrier of Last Resort for its competitors, at least for the foreseeable future. The result may be to limit the flexibility with which ILECs, especially the regional Bell operating companies (RBOCs), will be able to exit markets or discontinue services. By discontinuing a service, an ILEC may affect the ability of competitive ETCs, indeed of non-ETC LECs also, to provide service to their customers.

The ILEC will function as a Carrier of Last Resort for its competitors.

Role of the RBOCs

A specific subset of ILECs, the RBOCs, face an even more detailed list of duties and responsibilities to their competitors. In order to enter the interLATA market, from which they have been precluded by the MFJ, the RBOCs must demonstrate that they are providing competitors with access and interconnection involving all the elements included on a competitive checklist. The competitive checklist, interestingly enough,

[31] The FCC's recent report on interconnection seeks to implement the provisions of the 1996 Act by addressing issues of interconnection, pricing, and access to unbundled network elements. In this proceeding, the FCC is cognizant of the incumbent's dominant position, especially in negotiations, noting that "incumbent LECs have no economic incentive . . . to provide potential competitors with opportunities to interconnect with and make use of the incumbent LEC's network and services." See *First Report and Order*, FCC 96-325, at paragraph 55.

includes virtually all of the components of universal service. In addition to interconnection and access to network elements and rights-of-way, the competitive checklist provides for the unbundling of the loop, local switching, and local transport, access to 911 and E911, access to directory assistance and operator call completion services, white page directory listings, as well as access to the information and databases necessary for dialing parity and number portability.[32]

The Act places the burden for assuring that the ILECs in general, and the RBOCs in particular, are fulfilling all of these responsibilities on the state commissions.

The Act places the burden on the state commissions for insuring that the ILECs in general, and the RBOCs in particular, are fulfilling all of these responsibilities. It is the state commissions which will serve as arbitrators if ILECs and other LECs cannot agree on interconnection agreements; and it is the state commissions which will attest to the RBOCs' compliance with the competitive checklist provisions. Compliance by the RBOCs with the competitive checklist will help create a basis for competition in ETC services.

Infrastructure Sharing

Another provision of the Act outlines further obligations on the part of the ILECs which are designed to facilitate the provision of universal service by non-ILEC providers. Within one year of enactment of the 1996 Act, the FCC is directed to prescribe regulations requiring ILECs to engage in infrastructure sharing with "qualifying carriers." Qualifying carriers are defined as those carriers who are lacking in economies of scope or scale but are in the position of offering all of the elements included in the universal service definition to "all consumers without preference throughout the service area of which such carrier has been designated as an eligible

[32] 47 U.S.C. Section 271(c)(2)(B)(i)-(xiv).

telecommunications carrier under section 214(e)."[33] This infrastructure sharing entails making available "public switched network infrastructure, technology, information, and telecommunications facilities and functions as may be requested by the qualifying carrier."[34] ILECs are not required to provide infrastructure sharing on a common carrier basis, nor to undertake such arrangements if they would cause the ILEC economic harm. ILECs are also not required to engage in infrastructure sharing agreements for any services which the qualifying carrier would offer in competition with the ILEC.

These infrastructure sharing provisions could be helpful in making competitive ETCs a viable option for rural areas adjacent to ILEC territory.

These infrastructure sharing provisions can accomplish several goals. They can facilitate the qualifying carrier's efforts to provide services beyond basic services, thus accomplishing economies of scope. They can also augment the qualifying carrier's efforts to provide basic universal service elements. These provisions are reminiscent of the arrangements now in place between RBOCs and independent telephone companies in which the independent telephone companies "subtend" RBOC switches and, through these arrangements, are able to offer advanced services. These infrastructure sharing provisions could be helpful in making competitive ETCs a viable option for rural areas adjacent to ILEC territory.

The Importance of Service Areas

A major concern for potential ETCs will be the area in which services must be provided. For the state commissions, which are charged with the task of assuring the provision of universal access through ETCs, the simplest approach would appear to be to appoint the ILEC as an ETC for its entire current service territory. In this way, at

[33] 47 U.S.C. Section 259(d)(1)-(2).

[34] 47 U.S.C. Section 259(a).

least one ETC would be in place in all areas which currently receive service. Even this seemingly simple step, however, is fraught with questions about how to balance arguments of equity with the desire to ease competitive entry.

On the one hand, the state commission can require the ILECs to serve their entire service territory. The state commission must then decide whether to require the competitive ETCs to serve the whole territory as well, or whether to allow competitive ETCs to serve some subsection of the ILEC territory. Commenters in the FCC's recent universal service proceedings have argued that allowing ETCs to serve only parts of the ILEC's territory will place the ILEC at a disadvantage and allow the competing ETCs to "cream skim," to serve those segments of the ILEC territory with the densest population and the easiest terrain. The ILEC meanwhile would be forced to serve all customers and terrains. On the other hand, having to serve all of the ILEC's service territory could present a significant barrier to entry for competing ETCs, few, if any, of whom would have facilities and resources in place in that whole territory. CAPs, for example, whose facilities tend to be highly concentrated within urban areas, may find the requirement to serve a whole ILEC territory impossible, even if they are able to supplement their own facilities with resale or unbundled access to ILEC facilities.

Having to serve all of the ILEC's service territory could present a significant barrier to entry for competing ETCs.

Allowing potential ETCs to choose their own service areas creates other problems.

Allowing potential ETCs to choose their own service areas creates other problems.[35] Potential ETCs will, for obvious reasons, elect to serve areas with high population densities, like large suburbs or affluent urban areas. The result could be a

[35] The recent local competition order by the Public Utilities Commission of Ohio allows new entrants to self-define their service areas, and to receive universal service subsidy funds for those areas. See Case No. 95-845-TP-COI, June 12, 1996.

situation in which there are islands, even within a city, for which there are several competitive ETCs and other islands for which the ILEC is the only ETC provider.

State commissions could decide not to require ILECs to serve their whole existing service territory. Commenters in the universal service proceeding have argued that, in the interest of equity and because this is to be a competitive environment, ILECs should not be required to serve all of their current service areas if the competing ETCs are not required to fulfill that obligation. If ILECs are able to opt out of segments of their current service areas, however, they are as likely as their competitors to serve only the densely populated, more affluent areas. As a result, the state commissions would face the difficult task of assuring that there is at least one ETC in the less-desirable portions of the ILEC's former service area. In effect, the state commissions would not have the advantage of using the current arrangements as a starting point from which to introduce competition.

The framework for introducing local competition which is set forth in the 1996 Act, places a different standard on the ILECs in terms of interconnection and unbundling. State commissions may decide to place a different standard on the ILECs in regard to ETC status as well. In order to encourage new entry while also assuring the continued provision of service to existing customers, state commissions may find it most advantageous to designate ILECs as ETCs for their current service territory, at least on a transitional basis, and to designate competitive ETCs for smaller service areas. The adoption of this approach for a transitional time period would give new entrants the opportunity to emerge as ETCs for larger and larger service areas and would eventually give ILECs the option of relinquishing their ETC responsibilities as new ETCs develop. In the interim, customers would continue to receive uninterrupted service.

State commissions may find it most advantageous to designate ILECs as ETCs for their current service territory.

If competitive ETCs are to be designated for service areas smaller than the whole ILEC territory, state commissions still must decide what those service areas will be. The smaller the service area, the lower the barrier to entry for new competitors. However, the smaller the service area, the smaller the scale economies involved and the less likely that viable competition can be supported. For this reason, the Census Block Group, which includes about 400 lines, would seem to be too small a unit for an ETC service area.[36] The service area of a competitive ETC could be defined in terms of several Census Block Groups. It may be difficult for a state commission to assure that all areas are being served by the ILEC and at least one other ETC if the service areas of the competitive ETCs do not follow some existing boundary lines. Underserved pockets could develop as a result, as shown in Figure 8.

The smaller the service area, the smaller the scale economies involved and the less likely that viable competition can be supported.

State commissions could determine that competitive ETC service areas should correspond to existing ILEC wire centers. Because ETCs will require access to ILEC facilities, they may find it advantageous to locate their own facilities in close proximity to ILEC wire center locations. There are benefits associated with defining the wire center as the service unit. Wire centers could provide sufficient scale economies and sustain a viable level of competition. Wire centers also often encompass a variety of subscribers and terrain. Competitive ETCs could be charged with the duty of providing universal service to all subscribers within an existing ILEC wire center.

State commissions could determine that competitive ETC service areas should correspond to existing ILEC wire centers.

[36] Because the service areas not only determine the range of the ETC's service obligation, but also the basis for calculating the cost of providing service, and therefore the basis for potential universal subsidy funding, the service area should correspond to commonly understood units. One unit which has been widely discussed in terms of measuring the cost of providing service is the Census Block Group. The issue of cost calculation and subsidy funding is discussed later in this study.

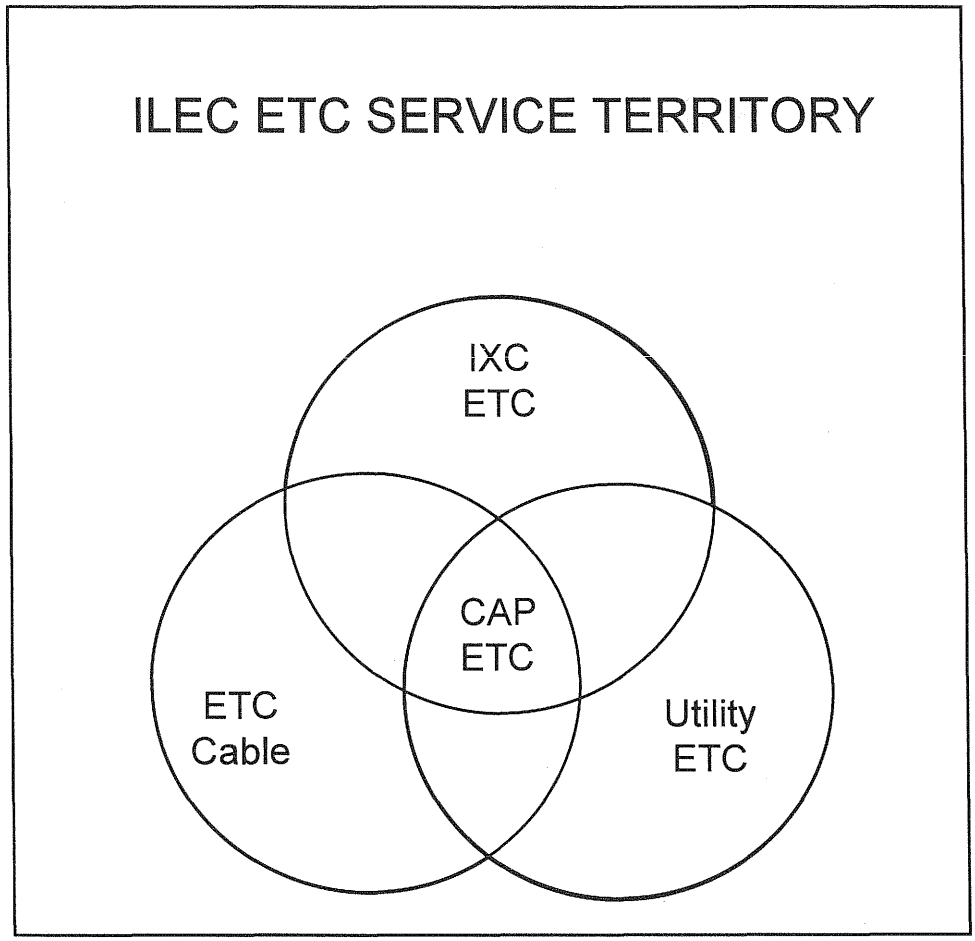

Figure 8: ILEC territory with spotty ETC competition.
Source: Author's construct.

Another option for designating ETC service areas is the current local calling area. Like the wire center option, the local calling area provides some ease in tracking subscribers and coverage. In some sense, the local calling area is the unit into which competition is now being introduced. Competition already exists in calling between local calling areas (i.e., intraLATA traffic).

Competitive ETCs could be charged with the duty of providing universal service to all subscribers within an existing ILEC wire center.

The use of a local calling area as the unit for service raises a basic issue regarding the services which are included in the universal service definition. It can be argued that the universal service definition implies the provision of local service as an element. Indeed, flat-rate service is one component of the definition for universal service in the State of Ohio. Some commenters in the universal service proceeding have argued that the universal service definition should include access to the network, but not use of that network. There are problems with this approach. Defining universal service as including access but no local usage would, in one step, introduce local measured service as the norm. Local measured service is precluded by law in some states. Excluding usage from the universal service definition may also be counter to the provisions of the 1996 legislation. One determinant for deciding what should be included in the universal service definition is that a majority of residential customers subscribe to a service; the majority of residential customers subscribe to flat-rate local service.

It can be argued that the universal service definition implies the provision of local service as an element.

Another benefit of using the local calling area as the service area unit is the issue of service comparability. If ETCs have different service areas, they

If ETCs have different service areas, they in all likelihood may also have different local calling areas.

in all likelihood may also have different local calling areas. If ETCs are to receive a subsidy from a central fund for providing a specific list of services at an affordable rate (presumably the same affordable rate), then allowing ETCs to establish different local calling areas may mean that customers are not receiving equal services for equal rates.

The provision of different local calling areas may mean that customers are not receiving equal services for equal rates.

Of course, as shown in Figure 9, the boundaries of a local calling area do not necessarily have to coincide with a specific ETC's service area. The ETC can charge the customer a local rate for calls within a specific territory, even if the ETC does not serve that whole territory or serves more than that territory. The ETC pays other carriers for terminating traffic on their networks. It is up to the ETC to determine what to bill the subscriber for placing those calls. The cost to an ETC for providing a local calling area significantly larger than its own service area may be greater because of these termination charges. The ability of the ETC to recover these costs through a combination of local rates and universal service support subsidy would become an issue of concern for the ETC. Specifying that competing ETCs serve the same local calling area could simplify the determination of costs and subsidy payments. Specifying that competing ETCs serve the same local calling area would also assure that there is parity in the provision of basic services.

Specifying that competing ETCs serve the same local calling area would also assure that there is parity in the provision of basic services.

The size of a local calling area will be of concern to all competitive local service providers, not just ETCs. Of even greater concern may be the specific boundaries involved. Current ILEC local calling area boundaries have resulted in numerous requests for extended area service (EAS) being filed by unhappy subscribers who live close to the calling areas borders. Self-defined local calling areas by competitive

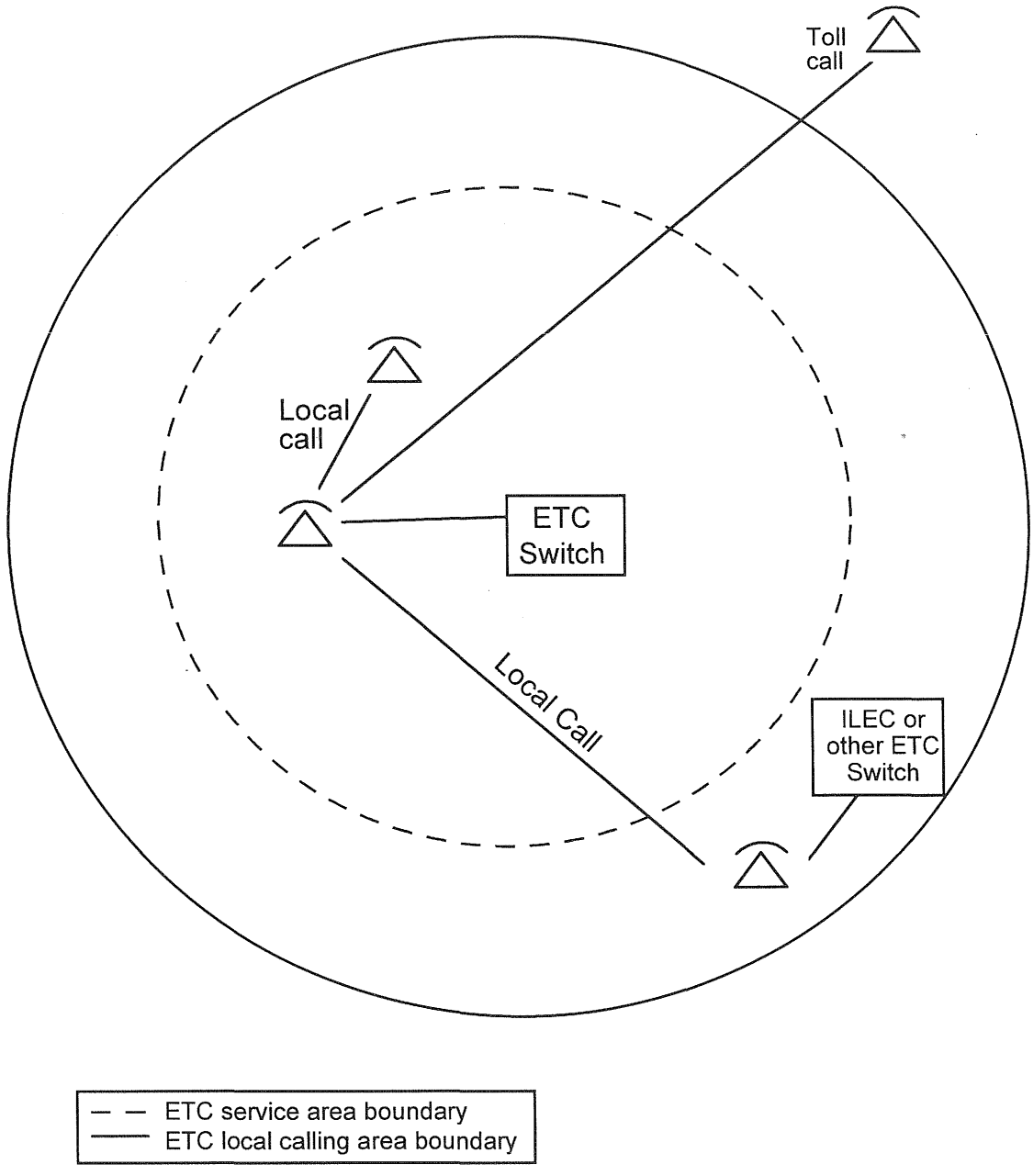

Figure 9: Possible difference in ETC service area and ETC local calling area.
Source: Author's construct.

The issue of parity among local calling areas may be a purely competitive concern for non-ETC providers.

providers may offer current EAS subscribers an attractive alternative. The issue of parity among local calling areas may be a purely competitive concern for non-ETC providers. For ETC providers, because of the universal service definition and the subsidy mechanisms designed to support its provision, the issue of parity among calling areas takes on a different dimension.

The existence of several competitive carriers, each with a different local calling area, may make the designation of the current ILEC local calling as the ETC service area a logical initial step. Most competitive local providers will have local calling areas which are greater or smaller than the current ILEC calling area. The result could be a territory which looks like that shown in Figure 10. In this configuration, it will be difficult for subscribers to compare and evaluate services and providers. If ETC providers are to offer comparable services to subscribers, they should encompass comparable calling areas. Defining those calling areas as coinciding with current ILEC local calling areas provides subscribers with some continuity from current arrangements.

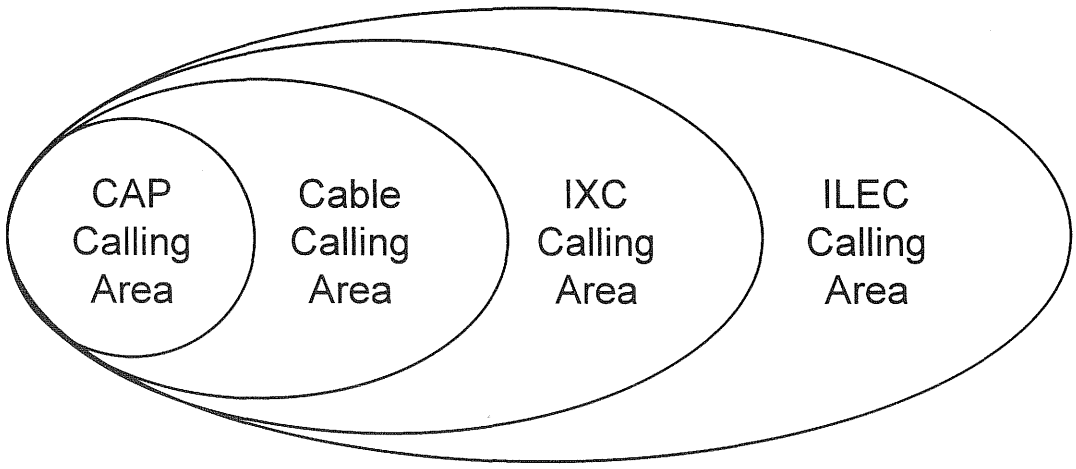

Figure 10: Varying local calling areas within a territory.
Source: Author's construct.

In looking at the issue of service areas for ETCs, state commissions do have several options, ranging from requiring coverage of the entire current ILEC territory by all ETCs to not requiring coverage of the entire current ILEC territory by any ETC. As shown in Figure 11, each option has different implications for scale economies, barriers to entry, and disruption of current subscriber services.

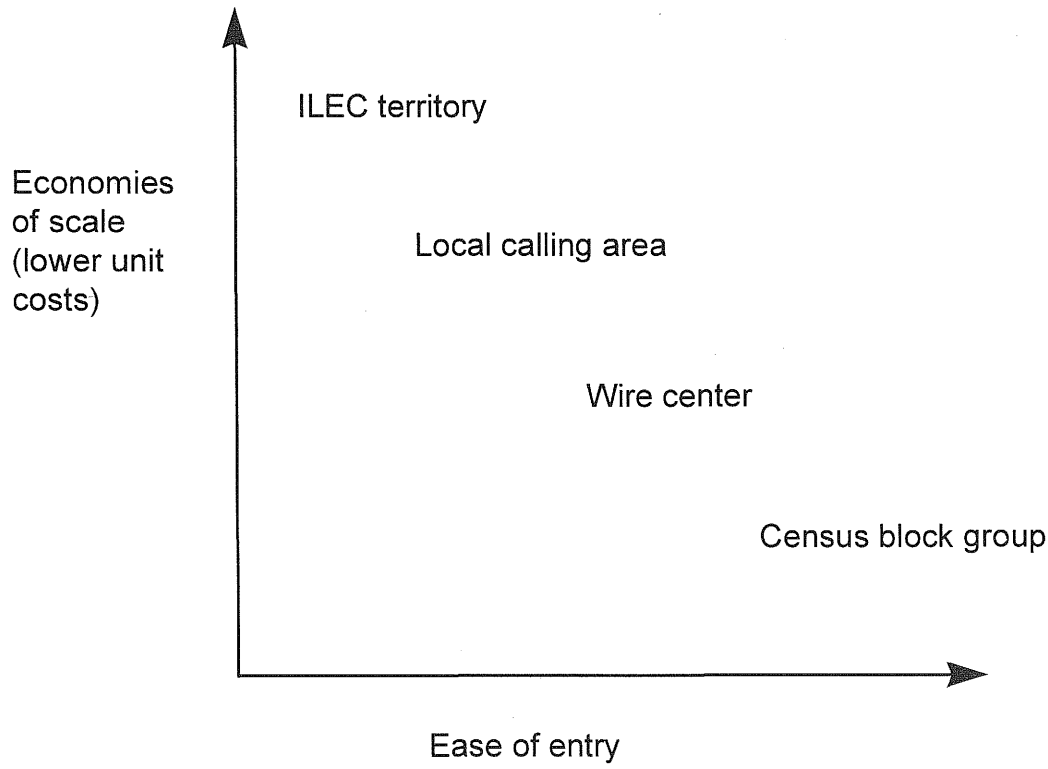

Figure 11. Range of ETC Service Area Options.
Source: Author's construct.

How Many is Too Many?

The 1996 Act specifies that state commissions are to designate more than one ETC in nonrural areas; however, the legislation does not stipulate any precise number of ETCs. State commissions have discretion in deciding how many ETCs to designate for each service area. In exercising this discretion, state commissions have to balance several interests. On the one hand, they have the responsibility to assure that universal service is being provided; on the other hand, they have the duty to avoid causing companies economic harm through unreasonable requirements. State commissions, therefore, have to determine how many ETCs can reasonably be expected to provide service in a service area.

It is important to remember that the 1996 Act states that companies can request ETC designation, or that the state commission can designate ETCs on their own motion. The outcome of these provisions may be that there are service areas for which state commissions do not have to act upon their own motion to identify ETCs, and other areas for which no ETC steps forward. It is likely that the willing ETCs will step forward for the more attractive service areas. State commissions must be prepared to respond to several different scenarios. In the scenario in which many potential ETCs step forward, the state commission could adopt the strategy of designating any carrier who comes forward as an ETC. In this way, market forces will determine ETC provision; if companies wish to participate, they should be given the opportunity. If several ETCs step forward, and one fails and must relinquish its responsibilities, others will be in place to assume those duties. State commissions, however, may find it inefficient to designate more carriers than can reasonably be expected to survive. The cost in customer confusion and increased state commission activity alone could make this approach problematic.

State commissions must be prepared to respond to several different scenarios.

Another scenario which a state commission could face is one in which no ETCs step forward for an area, or the only ETC in place is the ILEC. In this instance, the state commission will have to decide how to identify a potential ETC or potential ETCs. The state commission will also have to determine how many ETCs are sufficient to fulfill the requirements of the 1996 Act.

State commissions can look for guidance to past industry trends and other provisions of the 1996 legislation. In determining a minimum number of ETCs per service area, a state commission may consider the efficacy of moving gradually into a competitive framework. A duopoly approach, following the cellular industry model, could provide a useful transitional phase for the local market. In a sense, the wireless industry is moving from the initial duopoly structure of the cellular industry into the more openly competitive structure of the PCS industry. When implementing cellular, the FCC found a duopoly the best approach for introducing a new technology and set of services. A competitive telecommunications market was introduced in Great Britain through a duopoly between British Telecom and Mercury. In both of these instances of duopoly, the existing infrastructure provided a stable anchor point from which to move into competitive service provision. In this same way, a state commission may decide that a duopoly between the ILEC and another ETC could provide an orderly method for introducing competition into basic services.

The provisions of the 1996 Act regarding the rural telephone company exemption may also provide some illustrative insights. The Act exempts rural telephone companies from interconnection, at least in the short term, because the characteristics of the rural telephone companies and of the areas they serve make the introduction of competition appear problematic. Rural telephone companies are defined by the Act as serving communities with fewer than 10,000 inhabitants or exchanges of fewer than 50,000 lines. The areas which these rural telephone companies serve tend to have very few larger subscribers, making the companies highly vulnerable to the problems associated with bypass, or "cream skimming," because of this lack of diversity in subscribership.

State commissions may consider these same kinds of issues in deciding how much competition can be viable in a specific area. Number of access lines, mix of customers (business versus residential, affluent versus less-affluent), and specifics regarding terrain can be crucial elements in determining the level of sustainable competition. A situation in which several ETCs are faced with only one or two large customers and a small base of basic service customers may not result in sustained, viable competitive provision of service by robust service providers. A service area with 100,000 access lines, for example, would probably not be able to sustain four or five ETCs. It is doubtful that four or five ETCs would step forward to provide service in an area of this size; a state commission, if acting on its own motion to identify and appoint ETCs, should not designate four or five ETCs either.

Carriers could bid on the level of support they would require in order to serve an area as an ETC.

In designating an ETC for an unserved area, a state commission could first turn to market forces by conducting a COLR auction. Carriers could bid on the level of support they would require in order to serve an area as an ETC. The state commission could select the best bid. In order to assure that more than one ETC serves that territory, the state commission could then designate one or more other ETCs to serve as well. The problem with the auction approach, however, may be that the level of support resulting from the bid may not be adequate to support the desired level of service.[37]

State commissions have other options in designating ETCs for unserved areas. A state commission can name the ILEC as an ETC for the area; the ILEC is the most likely to have facilities close to the unserved area and so would not face an undue hardship in extending service, especially if the universal service subsidy involved is adequate to cover the costs involved. Automatically naming the ILEC serves to maintain the current local service monopoly however. An alternative approach could be

[37] This issue is discussed later in this analysis.

for a state commission to identify a LEC with facilities in place relatively close to the unserved area and name that carrier as the ETC. Cable companies, with their fairly extensive facilities, would be likely candidates. Wireless providers, if it is eventually determined that they can qualify as ETCs, would be likely alternatives to the ILEC as well.

It is not clear what the effect of competition in ETC services will be on the cost of universal service. Much will depend upon the method in which subsidy funding is determined. If the actual costs of each ETC are considered, then the cost of universal service may increase. As ETCs are added, the number of lines served by each ETC declines, as do the scale economies involved. The unit cost of service for each ETC may go up as a result, placing a greater burden on the universal service fund. If the subsidy funding is the same for each ETC, regardless of actual costs, the cost of universal service would not increase. It would make no difference which ETC provided the service, the same subsidy would be provided. The impact on the individual ETCs could be significant, however; fewer ETCs might find it attractive, or even feasible, to provide service. Universal funding mechanisms are an element which state commissions should consider when deciding how many ETCs to designate for an area.

It is not clear what the effect of competition in ETC services will be on the cost of universal service.

As ETCs are added, the number of lines served by each ETC declines, as do the scale economies involved. The unit cost of service for each ETC may go up.

Urban and Rural Issues

The 1996 Act articulates a commitment to providing affordable service for all areas of the country, including high-cost, insular locations, and for all of the population, including low-income consumers. This commitment presents some interesting challenges to those implementing the provisions of the legislation. The Act envisions a

competitive environment for all telecommunications services. In a truly competitive environment, companies are free to enter and exit markets, are free to avoid high-cost areas, are free to target specific customers and avoid others, and are free to set prices to cover costs and profits, without regard to an affordability standard. In a truly competitive environment, high-cost and insular areas would either not be served, or would be served at high prices; and the income status of consumers would not be a concern. The 1996 Act does not, however, envision a truly competitive market. It includes provisions to assure that the interests of rural areas and of low-income consumers are met.

It would appear that the situations in rural areas and those in urban areas are strikingly different; however, the basic problems involved in both areas may be surprisingly similar. In both types of areas the issue of affordable pricing is a major concern; the difference is that the underlying affordability problems have different causes. In rural areas, population density is low and terrain is often difficult. There are subscribers willing to pay for service, but the underlying costs of providing service may be so high that cost-based rates would not be affordable, even to consumers who are not considered low-income. In urban areas, population density is high and terrain is usually not a major concern. The underlying costs of providing service may not be high; however, there are urban areas in which the preponderance of consumers are low-income and not likely to afford basic, or advanced, services. For differing reasons, therefore, rural areas and some sections of urban areas present a unique challenge in assuring that there are ETCs in place to provide universal service.

The 1996 legislation recognizes that rural areas do face unique problems in moving toward local competition, especially if those rural areas are served by small telephone companies. Those areas which are served by large LECs, or by RBOCs, present the problem of assuring that competitive ETCs do emerge. Competitors to the RBOCs or large LEC will be more inclined to compete in the more densely populated segments of the ILEC's territory. The challenge for state commissions is to define ETC service areas in such a way that the rural segments of ILEC territory are served by

competitive ETCs, especially since the large ILECs or RBOCs may wish to relinquish their position as carrier of last resort for the rural segments of their current operating territory. If large ILECs are allowed to relinquish their ETC status, state commissions will have to assure that alternate ETCs are identified. Even if the ILEC continues to serve as the ETC, state commissions still have the responsibility for assigning more than one ETC if the rural area is not served by a rural telephone company.[38] Potential ETCs for rural areas may not be as abundant as for urban areas. CAPs have not established facilities in rural areas and so would not have a base upon which to build. IXCs may be a possibility because their long distance service areas extend into rural locations; however, they have tended to reach customers in rural areas by traversing ILEC-provided joint trunk groups. The tendency for IXCs has not been to locate their switches or transmission facilities in rural communities. While cable television facilities are abundant in urban areas, suburban areas, and rural towns, their reach often does not extend into the more remote rural areas. Wireless providers may offer a viable alternative, once their status as a potential ETC is clarified.

Potential ETCs for rural areas may not be as abundant as for urban areas.

While the large ILECs may seek to relinquish their ETC status, it is less likely that rural telephone companies will want to relinquish their position as carriers of last resort. Unlike the larger LECs which serve a variety of locations and service areas, rural telephone companies may provide service only in one territory. The 1996 Act seeks to shield the areas served by rural telephone companies from potential problems

It is less likely that rural telephone companies will want to relinquish their position as carriers of last resort.

[38] The specific language of the Act states that state commissions "may, in the case of an area served by a rural telephone company, and shall, in the case of all other areas, designate more than one common carrier as an eligible telecommunications carrier . . . ." 47 U.S.C. Section 214(e)(2). Because the definition of a rural telephone company is quite specific, and fairly narrow, the vast majority of service areas in the nation are, therefore, to be served by more than one ETC. (See 47 U.S.C. Section 153(2)(47) for a definition of rural telephone company.)

caused by competition. Those ILECs which are by definition designated as Rural Telephone Companies[39] are granted an exemption from interconnection and unbundled access provisions until they receive a bona fide request for interconnection or network services. Even if a request is received, the exemption can continue if the state commission finds that the request would be economically burdensome, technically infeasible, and inconsistent with universal service requirements.[40] In addition, state commissions are not required to designate more than one ETC for an area served by a rural telephone company. Indeed, before designating an additional ETC for such an area, the state commission is required to first "find that the designation is in the public interest."[41] Indeed, the state commissions are granted the tools to assure that any carrier seeking to provide service to some rural areas will have to do so as an ETC, and not as a competitor targeting a few large customers. For those markets in which the rural telephone company has not received an exemption from competitive interconnection, state commissions are allowed to "require a telecommunications carrier that seeks to provide telephone exchange service or exchange access in a service area served by a rural telephone company to meet the requirements in section 214(e)(1) for designation as an eligible telecommunications carrier for that area before being permitted to provide such service."[42] Rural telephone companies are small companies that are very sensitive to any concentrated loss of subscribership. This provision of the Act gives

State commissions are granted the tools to assure that any carrier seeking to provide service to some rural areas will have to do so as an ETC, and not as a competitor targeting a few large customers.

[39] That is, they serve an area which does not contain any incorporated area of 10,000 or more inhabitants; or provide telephone exchange service to fewer than 50,000 access lines; or provide telephone exchange service to fewer than 100,000 access lines in a study area (state). (See 47 U.S.C. Section 153(47)).

[40] 47 U.S.C. Section 251(f)(1)(A).

[41] 47 U.S.C. Section 214(e)(2).

[42] 47 U.S.C. Section 253(f).

state commissions the authority to assure that any potential competitor to the rural telephone company cannot just "cream skim," but rather must serve the whole area. The objective, therefore, is two fold: the economic viability of the rural telephone company is protected, and rural subscribers are given a competitive choice for universal service.

State commissions face a different variety of challenges in rural areas, depending upon the ILEC currently providing service. For rural areas now served by a large ILEC, the challenge will be to assure that there is competitive ETC service provided, either by the ILEC and a competitor, or by two competitive ETCs. For rural areas served by a rural telephone company, the first priority appears to be to preserve the economic viability of the existing rural telephone company. State commissions are to allow competition only if it can be introduced in a manner which will not harm the incumbent small telephone provider.

In urban areas, the issues involved do not involve the continued viability of an incumbent telephone company; nor do they involve issues of population density or terrain. Rather, the issues revolve around the lack of a critical mass of subscribers able to afford service. It is possible that a form of ETC redlining may take place in urban areas as ETCs avoid providing service to areas with large concentrations of low-income subscribers. As with rural areas, state commissions may find it expedient to name the ILECs as ETCs for such urban areas. This would at least assure that neighborhoods now receiving service will continue to do so. Designating additional ETCs may not be so easy.

ETC redlining may take place in urban areas as ETCs avoid providing service to areas with large concentrations of low-income subscribers.

While the 1996 Act makes special provisions for rural areas, it does not do so for poor urban locations. The Act seems to assume that competition will emerge in all urban areas. In the very poorest parts of communities like Camden, New Jersey, in

which more than 40 percent of the subscribers do not have telephone service,[43] the emergence of competition may be problematic. State commissions may have to use their authority to identify and appoint ETCs for such areas. One approach which state commissions may use is to define service areas in such a way that they encompass both poor areas and more desirable service areas. This would argue for a designation of service area that goes beyond a few Census Block Groups to encompass a wire center or a local calling area or a quadrant of an urban area.

Rural and poor urban areas present some unique problems. However, the provisions of the 1996 Act specify that universal service be provided to all subscribers, including those in who are low-income and those who live in rural areas. State commissions, in their designation of service areas and of ETCs, have the tools to assure that these goals of the legislation are attained.

State and Federal Funding for Universal Service

The Act makes it clear that there should be funding mechanisms in place to defray the cost of providing universal service at both the federal and state levels. All providers of interstate telecommunications services are to contribute on an "equitable and nondiscriminatory basis" to the "specific, predictable, and sufficient mechanisms" which the FCC will establish for the purpose of preserving and advancing universal service; providers of intrastate services are to contribute in a similar fashion to state-established mechanisms.[44] Only those carriers designated as ETCs will receive subsidy payments from these federal and state mechanisms. The ETCs are to use

[43] Milton Mueller, and Jorge Reina Schement, "Universal Service from the Bottom Up: A Profile of Telecommunications Access in Camden, New Jersey," A Research Study Performed for Bell Atlantic, no date given.

[44] 47 U.S.C. Section 254(d) and (f).

those payments only for "the provision, maintenance, and upgrading of facilities and services for which the support is intended.[45]

The states are granted some latitude in establishing their own funding mechanisms and procedures. They can add elements to the federally defined list of universal service elements in deciding what will be covered by a state fund. They do not have to mirror federal procedures. The legislation, however, does stipulate that any actions by the states are acceptable only as long as they do not affect federal arrangements.

States can add elements to the federally defined list of universal service elements in deciding what will be covered by a state fund.

Actions by the states are acceptable as long as they do not affect federal arrangements.

> A State may adopt regulations not inconsistent with the Commission's rules to preserve the advance universal service. Every telecommunications carrier that provides intrastate telecommunications services shall contribute, on an equitable and nondiscriminatory basis, in a manner determined by the State to the preservation and advancement of universal service in that State. A State may adopt regulations to provide for additional definitions and standards to preserve and advance universal service within that State only to the extent that such regulations adopt specific, predictable, and sufficient mechanisms to support such definitions or standards that do not rely on or burden Federal universal service support mechanisms.[46]

The exact amount of latitude accorded the states by this provision is not clear. It is evident that the states will not be allowed to diverge from the basic intent of any FCC actions. It is also evident that the states will be expected to establish universal service

[45] 47 U.S.C. Section 254(e).

[46] 47 U.S.C. Section 254(f).

funding mechanisms which are explicit and targeted to specified services. Within these parameters, however, states do have significant leeway. They are not required to use the same costing methods or the same subsidy payment approaches as the FCC may ultimately adopt. States, for example, may opt for the use of proxy models in establishing costs, even if the federal funding mechanism is based on actual costs. Because ETCs will have to deal with both federal and state funding mechanisms and policies, state commissions may decide, in the interest of simplicity, to mirror at least some components of the federal procedures.

State are not required to use the same costing methods or the same subsidy payment approaches as the FCC.

The provisions specifying that state procedures not rely on, or burden, federal support mechanisms also suggest a degree of state autonomy. State mechanisms are expected to be self-sustaining. These provisions may also imply some limitations on independence, however. The FCC's range of freedom in determining what constitutes a "burden" on federal support mechanisms is not clear.

As with so many other provisions of the 1996 Act, the arrangements outlined in the legislation appear deceptively simple. The idea of a central funding mechanism (whether at the state or federal level) to which all providers contribute and from which all universal service providers receive subsidy seems straightforward; the implementation of this plan raises significant questions. The first question is exactly who the contributors to the funding mechanisms will be; the next question is, what constitutes an equitable and nondiscriminatory basis for contributions.

The language of the Act appears to exempt information service providers from contributing to a funding mechanism. Providers of telecommunications services are to be the contributors, and the definition of telecommunications in the Act is very specific. The term telecommunications is defined as "the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form

or content of the information as sent and received."[47] Likely contributors are IXCs who provide interstate long distance, for the federal fund, and intrastate long distance, for any state funds. Other contributors are providers of exchange access for interstate traffic (federal fund) and for intrastate traffic (state funds). The ILECs are obvious examples of such providers; the CAPs are other such providers. Cable companies would be included only in so far as they would provide telecommunications services like exchange access. The status of wireless providers as contributors is not clear, though the FCC's recent interconnection order made it clear that CMRS providers are telecommunications carriers[48]. The Act gives the FCC the authority to exempt a carrier, or a class of carriers, whose contributions would constitute a minimal amount of support. This may be the case for small competitive exchange access providers, just as it is the case for small IXCs now.

There is no one basis on which to calculate contributions; the Act merely requires that any methodology be equitable and nondiscriminatory. The options available for calculating contributions include gross revenues, gross revenues net of payments to other providers, or a usage-based measure like percentage of minutes or lines. Theoretically, all telecommunications providers are asked to contribute because all providers garner some benefit from the existence of universal service. The more customers there are, the more robust the traffic and the services. There is some equity therefore in requiring a greater contribution from those entities which generate greater amounts of revenue or traffic.

Choosing a usage-based measure for calculating contributions presents some difficulties. Currently, IXCs pay USF and Lifeline Assistance rates based

Choosing a usage-based measure for calculating contributions presents some difficulties.

[47] 47 U.S.C. Section 153(a)(48).

[48] See, In the Matter of the Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 (CC Docket No. 96-98), and Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers (CC Docket No. 95-185), *First Report and Order*, FCC 96-325, August 8, 1996, at paragraph 33.

on the number of presubscribed lines they serve. It might be feasible to calculate LEC contributions on the number of local lines served; however, not all telecommunications services are based on access lines. This approach could exclude classes of contributors. The use of minutes creates a problem of definition; not all minutes are the same. An access minute is calculated differently from a toll minute. Using access minutes for LECs and toll minutes for IXCs would result in inequitable and discriminatory contributions.

The use of net revenues may be more appropriate.

The use of revenues is a more equitable approach. The question remains, however, whether the revenues should be gross revenues, or gross revenues net of payments to other providers. The use of gross revenues has the effect of double counting access charges. They would be included as revenues for exchange access providers and would also be included in IXC toll revenues. The net effect of using gross revenues is to attribute a larger percentage of contribution to the IXCs; therefore, the use of net revenues may be more appropriate.

The Issue of Affordable Rates

The fund should consist only of the support needed to defray those costs of universal service which are not covered by the affordable rates charged subscribers.

Once the basis for calculating a contribution percentage is determined, the next issue is the amount of money needed to help maintain and advance universal service. According to the Act, the fund should be specific, predictable, and sufficient to fulfill the stated goal. That stated goal is, of course, to assure that universal service is offered, at affordable rates, to all people in all areas of the nation, including high-cost, rural and insular regions. The services and the rates in the high-cost, rural and insular regions are to be reasonably comparable to those in urban, high-cost, and non-insular areas. Given

these parameters, it is safe to assume that the fund should consist only of the support needed to defray those costs of universal service which are not covered by the affordable rates charged subscribers.

The subsidy is the difference between the revenues generated by the affordable rates and the costs incurred in providing service.

The equation for calculating subsidy is the difference between the revenues generated by the affordable rates and the costs incurred in providing service. While regulators have had decades of experience arguing about costs, the concept of affordability has never before been an explicit statutory regulatory concern. It could be argued that the issue of affordability has been an implicit and inexact concern. Existing rates have been determined, for the most part, on a residual ratemaking basis. LECs, under ratebase regulation, argued for a specific revenue requirement. Once the regulators agreed to a revenue requirement, individual LEC services would then be priced at a level which would generate that revenue requirement. Most state commissions increased the prices of other LEC services first, and then increased local rates only if the targeted revenue requirement had not been reached. The resulting local rates were not cost based. Even with the advent of incentive regulation, the local rates determined under ratebase regulation tended to be the starting point for rate development. This is equally true for social contract regulation (those rates have been frozen for a specific number of years), as well as for price cap regulation.

While these local rates are not cost based, they seem, for the majority of households, to be affordable. If they were not generally affordable, the overall penetration rate in the nation would not be 94 percent. The penetration rate is not 94 percent for all households, however. According to a recent study, telephone penetration varies by race, age, region, and income.[49] Households in central cities

[49] See U.S. Department of Commerce, *Falling Through the Net: A Survey of the 'Have Nots' in Rural and Urban America*, July 1995.

which have income levels under $10,000 have only a 79.8 percent penetration rate; the figure is 81.6 percent for the rural poor. Minority households and households headed by people under 25 years of age also exhibit telephone penetration rates well below 94 percent, with rural households headed by those under 25 having a 77.2 percent penetration rate. It is safe to assume that the households headed by people under 25 years of age are also high-income households.

Another study, which looked at telephone penetration by census block for an urban area (Camden, New Jersey), found that there are census blocks in that city in which as many as 43 percent of the households do not have telephones.[50] That study also pointed out that factors other than the price of local service are deterrents to telephone subscribership, "Income, employment, and other measures of wealth or poverty are strongly related to low penetration not because the price of basic local phone service is too high, but because low-income users who run up large usage-related bills are unable to cover them."[51]

What these studies suggest is that there may be a need to expand targeted assistance programs such as LinkUp America to help defray not just service connection charges, but also service deposits and perhaps assistance with financing payments for usage-based charges. This study also suggests that basic local service should be available at a flat monthly amount and not exclusively on a measured-service basis. Given the results of the Camden, New Jersey study, it could be posited that affordable rates should be calculated based on average income level by census block. Such an approach could ultimately become unfeasible. As neighborhoods change through gentrification or through deterioration, rates would have to be recalculated on a continual basis. Also, unless the service area for an ETC is a census block, the ETC would run the risk of providing service on a discriminatory basis within its total service area by providing the same services at varying rates.

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[50] Mueller and Schement, "Universal Service from the Bottom Up: A Profile of Telecommunications Access in Camden, New Jersey."

[51] Ibid., 12.

For rural, insular, and high-cost areas, an added concern, beyond affordability, is reasonable comparability to urban rates. The term "reasonably comparable" is vague at best. One way of approaching this issue is to employ a methodology used by state commissions in defining a range of reasonableness for rate changes. In several states, providers of services facing some level of competition, intraLATA toll is one example, have been able to file rates which are presumed valid as long as the change in the rates falls within a specified range. This same sort of range of reasonableness could be established to define "reasonable comparability" for rural rates.[52] The FCC calculates average residential rates in its annual report on Common Carrier Statistics. Rates within a specified range of that average rate could be defined as automatically meeting the comparability test.

Because local rates have theoretically been kept low through a system of averaged pricing and subsidy flows, it could be argued that existing rates are not the appropriate starting point for this exercise. Commenters in the FCC's proceeding regarding establishment of a Joint Board regarding universal service issues, CC Docket 96-45, suggested arbitrary rates of $20 or $30 as being "affordable."[53] It may be valuable at this point to consider an observation by Carol Weinhaus, who pointed out that it is politically unacceptable to have major shocks to customers and companies, and it is difficult to

It could be argued that existing rates are not the appropriate starting point. Nevertheless, beginning the calculation of universal service subsidies with existing rates is a prudent course.

[52] See for example, the comments of the State of California and the Public Utilities Commission of California in the FCC's universal service proceeding (CC Docket 96-45). California policy is to require that rural rates are no higher than 150 percent of urban rates, and rates for low-income customers are no less than 50 percent of urban rates.

[53] MCI in its comments suggested a $20 per month rate as approximating the current average; U.S. West suggested a benchmark rate of $30.00.

make changes for which the outcomes are unknown.[54] In this instance, it is difficult to know how changes in local rates would affect subscribership and to gauge what level of change would create rate shock for customers.[55] Beginning the calculation of universal service subsidies with existing rates is a prudent course, especially since the goal is to maintain universal service. Regulators could develop a schedule of local rate increases, monitoring the effect on subscribership, in order to bring prices closer to cost without making them unaffordable.

Establishing the Cost of Universal Service

The next component of the subsidy equation is the cost of providing universal service. This is the most difficult element of the support formula because it can be based on so many different assumptions and desired goals, as was evident by the range of opinions and suggestions in the recent FCC proceeding. Some commenters assumed that the cost for ILEC-provided universal service will be grossly overstated; other commenters suggest that ILEC costs are reasonable and known. Commenters suggesting cost proxies and Carrier of Last Resort auctions expressed as a major goal the reduction of subsidy payments. Other commenters articulated as a major goal sufficient funds to cover universal service provision. Whatever approach is adopted will have profound implications for competitive provision of service, because each approach creates incentives for the companies involved, and the incentives will affect entry behavior.

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[54] Carol Weinhaus, Director, Telecommunication Industries Analysis Project, *Overview of Universal Service*, Presentation to the Communications Media Center, New York Law School, December 6, 1995, 17.

[55] A recent survey of rural subscribers found that rate increases would result in disconnection of service. Respondents to the survey claimed that a $5 increase in basic monthly rates would cause 4.3 percent to discontinue service; a $10 increase would result in 12.9 percent discontinuing service; a $15 increase would result in 27.1 percent; and a $25 increase would cause 44.7 percent to disconnect their telephones. See *Keeping Rural America Connected: Costs and Rates in the Competitive Era* (Washington, D.C.: Organization for the Protection and Advancement of Small Telephone Companies, 1994), chapter 5.

The current Universal Service Fund is based on an embedded cost study.

In identifying an approach to costs, there are several questions and several alternatives which need to be addressed. One major question is the costing approach which will be used. The current Universal Service Fund, which identifies the loop costs of providers whose costs are significantly higher than the nationally averaged amount, is based on an embedded cost study. Historical costs are used and overhead allocations are included. There is a growing consensus that fully distributed costs studies, based on historical costs, are inefficient mechanisms for measuring cost of service because they capture past decisions and past inefficiencies, and they allocate overheads in an arbitrary and inaccurate manner. Long-run incremental cost studies, because they are forward looking and include fewer overhead allocations, are regarded as a better cost measurement. A major question in the long-run incremental cost study approach is the treatment of the loop costs. Some proponents of long-run incremental costs argue that the loop should be allocated totally to local service. Opponents of this approach argue that this is reflective of a board-to-board philosophy which was abandoned in the 1930's because of *Smith* v. *Illinois Bell.*[56] If a board-to-board philosophy is adopted, toll and access charges would not bear any loop costs at all, and the cost of the loop would have to be borne totally by local rates and universal service support mechanisms.[57]

Even if the decision to use long-run incremental costs as a more efficient costing method is made, the question still remains about whose costs should be measured. Commenters in the FCC's recent Notice of Proposed Rulemaking (NPRM) in CC Docket 96-45 suggested a range of options for assessing the cost of providing universal service, including: using ILEC's actual costs, and imputing those costs to competitive

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[56] *Smith* v *Illinois Bell Telephone Co.,* 282 U.S. 133 (1930).

[57] The comments which the National Association of Regulatory Utilities Commissioners filed in the FCC's universal service proceeding (CC Docket 96-45), in arguing that the Carrier Common Line Charge should continue, note that "Loop plant, and associated network facilities, are used to provide both local and toll services."

ETCs; measuring the actual costs of all providers; and using proxy models and COLR auctions to determine what costs should be. Each of these suggestions has strengths and drawbacks, and implications for competition.

Actual Costs

ILEC costs are the only actual costs available for determining what universal service has been costing.

At this point, ILEC costs are the only *actual* costs available for determining what universal service has been costing. The drawback of using ILEC costs is that they are based on the engineering and marketing assumptions made by the specific ILECs. They are not technology neutral. Accepting ILEC costs as the standard and imputing that cost to the competing ETCs has the benefit of reducing regulatory burden, and therefore a barrier to entry, for the new providers, who will not have to implement possibly burdensome cost study procedures. The drawback of this approach is that the ETCs will receive a subsidy based on other carriers' costs. There is no way to assure on the one hand that the subsidy will be "sufficient" to cover ETCs' costs, or on the other hand that it will not be overly generous and cover more than their costs. In either case, the effect is to shift the competitive balance. In the first case, if the subsidy is insufficient, the ETCs will not be able to be viable providers of universal service, and perhaps not of any services in general. If the subsidy is overly generous, the ETCs will get a competitive advantage.

Proxy Models

The use of proxy models, rather than actual costs, has several benefits. The proxy model would, ideally, be built on the best estimate of what costs *should* be. Thus, the proxy model would include no inefficiencies and inappropriate overhead costs. The problem with the use of a proxy model is that the results are dependent on the assumptions used. Like actual costs, the proxy model is not technology neutral; certain assumptions must be made in order to even build a model. As the commenters in the FCC's NPRM pointed out, the outcome of proxy models varies greatly depending upon the approach taken and assumptions made. For example, much depends upon the number of lines included in the model. Adding business lines, rather than just using residential lines, changes the outcomes. The inclusion of business lines makes some intuitive sense, because most, if not all, ETCs will serve both residential and business lines. Indeed, the sensitivity of proxy models to the number of lines, that is, to the effects of economies of scale, which are built into the models, may suggest some problems in using proxy models to calculate support mechanisms for ETCs with varying abilities to achieve economies of scale. If the assumptions used presuppose a large degree of scale economies, the resulting support payments could be far too low for ETCs who do not have the subscriber base to enjoy significant scale economies. Another change in assumption which changes proxy model results is the effort to identify actual population distribution,

The proxy model would, ideally, be built on the best estimate of what costs should be.

If the assumptions used presuppose a large degree of scale economies, the resulting support payments could be far too low for ETCs who do not have the subscriber base to enjoy significant scale economies.

The outcome of proxy models varies greatly depending upon the approach taken and assumptions made.

rather than assuming evenly distributed population density. Again, the pure use of a proxy for costs does not offer assurance that the subsidy amounts calculated will be "sufficient" to cover the costs of universal service provision.

The use of proxies, rather than actual costs, presents another problem when the requirements of the 1996 Act are examined. The Act specifies that the recipients of universal service support payments are to use them "only for the provision, maintenance, and upgrading of facilities and services for which the support is intended. Any such support should be explicit and sufficient to achieve the purposes of this section."[58] The Act further states that telecommunication carriers "may not use services that are not competitive to subsidize services that are subject to competition," and grants the FCC and the state commissions the authority to craft any cost allocation rules, accounting safeguards, and guidelines required to "ensure that services included in the definition of universal service bear no more than a reasonable share of the joint and common costs of facilities used to provide those services."[59] The language of the Act seems to suggest that some effort must be made, on the part of all ETCs, to identify and account for *actual* universal service costs. However, in many other areas, i.e., interconnection and unbundling, the FCC is adopting a forward-looking economic cost standard called Total Element Long-Run Incremental Cost (TELRIC). It is not clear that "costs" of universal service could not also be considered as forward-looking costs.[60]

Auctions

Another suggested approach to cost identification is the COLR auction, a method which has been suggested for identifying ETCs for unserved areas. In this approach, carriers can bid on the subsidy amount that they are willing to accept for

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[58] 47 U.S.C. Section 254(e).

[59] 47 U.S.C. Section 254(k).

[60] For more on the use of proxy models see David Gabel, *Improving Proxy Cost Models for Use in Funding Universal Service* (Columbus, Ohio: NRRI), forthcoming.

providing universal service. All ETCs would be tied to that amount. The benefit of such an approach is to drive the subsidy costs down; the drawback is that the incentive will be to accept a small subsidy for providing poor service. An underlying problem with both the proxy and the auction approach is that support payments which result may not generate enough funds for ETCs seeking to establish a foothold in a service area. Large carriers, and ILECs, would have an advantage.

An underlying problem with both the proxy and the auction approach is that support payments which result may not generate enough funds for ETCs seeking to establish a foothold in a service area.

Other Questions

Other questions about cost determination must be considered. For example, the issue of resale needs to be clarified. Many of the ETCs will be relying on resale of ILEC services and the ability to lease unbundled network elements from the ILEC. The pricing standards for network elements articulated in the Act include cost plus a reasonable profit for the ILEC. No support payments would be appropriate for the ILEC in that regard. The competitive ETC theoretically pays for the underlying cost of service provision. The pricing standards for resale are different than those for network elements. Resale services are priced at retail rates charged to subscribers by ILECs, less marketing, billing and collection, and other avoided costs.[61] In a resale situation, the ETCs' costs are the wholesale rates they have paid; the ILEC has engendered the costs of providing the facilities. There is no guarantee that the wholesale rates paid by the ETC actually

There is no guarantee that the wholesale rates paid by the ETC actually reflect the underlying facilities costs involved in providing service.

[61] 47 U.S.C. Section 252(d).

reflect the underlying facilities costs involved in providing service. Providing the ETC with the support payment in this instance enriches the ETC at the expense of the ILEC. If the ILEC had provided the retail service, it would have been eligible for the support payment. In offering the service at wholesale, the ILEC uses the same facilities as it would use in providing the retail service. The ILEC does not sell the right to the subsidy when it sells the service at wholesale.[62]

Another question regarding support payments is a jurisdictional one. If there are support mechanisms in place at both the federal level and the state level for essentially the same services and service components, ETCs could receive duplicate support payments unless the two subsidy streams are coordinated. Support payments could be allocated arbitrarily, with a set percentage of the support needed coming from the federal fund and the balance coming from the state fund. The set percentage could be arbitrarily determined, much like the 25 percent of loop costs which are allocated to the interstate jurisdiction under current FCC access charge rules. This would be a simple approach, but one which would not be reflective of reality. An industry-wide percentage of total interstate telecommunications revenues versus total intrastate revenues could be approximated; such an approach would be a little more accurate than an arbitrary percentage. Total-industry percentages could also be calculated for each state, thus adding some precision to these calculations. Neither approach would be accurate for each individual provider. Another approach would be to require each ETC to apply a percentage to the total support payment requested from each jurisdiction.

ETCs could receive duplicate support payments unless the two subsidy streams are coordinated.

[62] The FCC's recent interconnection order seems to support this interpretation. ILECs are given the right to collect the Subscriber Line Charge and the PIC change charge from carriers who resell ILEC services. The resellers may be the point of contact for the subscribers, but the ILEC is the one that is eligible to collect the SLC to help defray the loop costs involved. See *First Report and Order*, FCC 96-325, at paragraph 983.

Implementing the New Mechanisms

As the new formula for calculating universal service support is developed, there is a question about what happens to the funding mechanisms now in place. The Act specifies that the existing LinkUp and Lifeline Assistance program be kept intact. At this point, that program consists of the IXCs paying into the program based on presubscribed lines; the ILECs are reimbursed based on actual provision of LinkUp and Lifeline Assistance. This program may need to be extended to include all new ETCs as receivers of support and all telecommunications carriers as contributors. If that is the case, a different basis for determining contribution will have to be derived since not all telecommunications carriers have presubscribed lines. The future of programs such as the existing Universal Service Fund; the Long-Term Support payments which non-pooling ILECs pay into the NECA carrier common line pool; and the Dial Equipment Minute (DEM) weighting, which allows small telephone companies to recover a greater percentage of switching costs from interstate access charges, are also not clear. Ideally, if these support mechanisms are needed to maintain universal service in high-cost and rural areas they will be reflected in the new calculations regarding the cost of providing universal service. If the result of the new support calculations is the instant loss of a substantial amount of the subsidy flows which existing LECs, especially rural telephone companies, have come to rely on,[63] some transition period may need to be formulated. The 1996 Act, because of the exceptions it provides for rural telephone companies, suggests that such efforts would be in keeping with the spirit of the legislation.

Ideally, if these support mechanisms are needed to maintain universal service in high-cost and rural areas they will be reflected in the new calculations regarding the cost of providing universal service.

[63] The 1994 OPASTCO study which examined 450 small rural telephone companies found that these companies receive an average of $31.27 per line per month from the various support mechanisms now in place. See *Keeping Rural America Connected*, 4-22.

Existing subsidy systems were developed in an absence of a formal definition for universal service. With a formal definition in place, it may be necessary to examine carefully what should be included as the cost of providing this basic service. If an ETC has to pay to get white page listings for a subscriber, or has to pay to get access to an operator, or has to pay to terminate local calls onto another ETC's network, should those be considered universal service costs? That is a question which must be considered in determining what comprises relevant, supportable costs. The existing Universal Service Fund included only loop costs. That level of support may no longer be sufficient.

Service Area Questions

The issue of support payments and the issue of service area are inter-related.

It is significant to remember that the issue of support payments and the issue of service area are inter-related. If the service area for the ILECs continues to be their existing service territories, at least for the foreseeable future, these service areas will have to be reflected in support payment calculations. This is especially true for rural telephone companies. It may not be feasible to expect other ETCs to serve whole ILEC territories. If non-ETCs are designated to serve in subsets of the ILEC territories, and if support payments are to be calculated in a competitively neutral manner, they will have to be derived from units smaller than current ILEC study areas. What those units should be is a matter of some controversy. Some commenters in the FCC proceeding suggested Census Blocks; other commenters noted that ILECs have not configured their networks on the basis of Census Blocks and would find it difficult to generate cost figures for those units. There

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is no indication that Census Blocks would represent the best way for ETCs to configure their networks either. It would be possible to calculate costs based on wire centers. Costs per wire center can be calculated for ILECs, at least for the larger ILECs with the capacity to do such calculations. The wire center is a ILEC configuration; ETCs may not configure their networks along the same lines. However, ETCs will probably wish to configure their facilities within some proximity of the ILEC wire centers, because they will require access to ILEC offices for purposes of network elements and resale. In that context, wire centers may be a feasible unit upon which to calculate costs for all ETCs, including ILECs.

It would be possible to calculate costs based on wire centers.

Subsidy Neutrality and Policy Goals

It is safe to assume that no approach to calculating subsidy payments will be totally neutral. Table 2 shows the potential impact of various approaches on the size of the subsidy fund, and therefore on the cost of the universal service subsidy. There are many conflicting interests involved. The ILECs will hope that subsidy payments reflect their embedded cost of providing service; new entrants will hope that payments are sufficient to provide them with enough resources to expand their facilities; those paying into the fund will want subsidy payments to be low and declining. For policy makers who must determine the actual subsidy calculations which will be used, much will depend upon the underlying policy goals. If the ultimate goal is to encourage expanded provision of universal service, the adoption of an approach which reimburses carriers for actual costs may be

If the ultimate goal is to decrease subsidies and push for the most efficient provision of universal service, then proxy models, standard payments regardless of carrier, and COLR auctions may be the preferable approach.

TABLE 2
Relation of The Size of The Universal Service Fund
And Alternative Costing Approaches

Alternative Costing Approaches	Resulting Fund Size	
	Larger Fund	Smaller Fund
1. Cost Model		
A. Use of Long-run Incremental Study		X
B. Use of Embedded-cost Study	X	
2. Network		
A. Use of a Proxy Model		X
B. Use of Actual ETC Network Configuration	X	
3. Service Territory		
A. Use of Large Service Area		X
B. Use of Small Service Area	X	
4. Cost basis		
A. Same Subsidy Payment for all ETCs		X
B. Subsidy Payment Based on ETC's Costs	X	

Source: Author's construct.

If the use of actual costs studies rather than proxy models provides larger subsidy payments, this will make ETC status a more attractive option to a wider range of carriers.

optimal. If the ultimate goal is to decrease subsidies and push for the most efficient provision of universal service, then proxy models, standard payments regardless of carrier, and COLR auctions may be the preferable approach. If the use of actual costs studies rather than proxy models provides larger subsidy payments, this will make ETC status a

more attractive option to a wider range of carriers. Providing each ETC with a set amount of subsidy may make ETC provision more burdensome for smaller carriers who do not enjoy large scale economies.

The size of the units upon which subsidy payments are calculated is also a crucial concern. Calculating subsidy payments on small service areas like Census Blocks may generate larger subsidy amounts because of the scale diseconomies; this may encourage entry and competition. Calculations based on larger service units will, conversely, generate smaller subsidy payments and may attract fewer potential ETCs.

It is important to remember that carriers who accept ETC responsibilities expect to be able, in return, to collect universal service support payments. The amount of payments available will have an impact on their decision to seek ETC status and on their economic viability should they be designated as an ETC by a state commission.

Conclusion

The 1996 Act outlines a unique approach to universal service provision by requiring that all aspects of telecommunications services, including the low-end basic services, be competitively provided. The legislation seeks to balance two seemingly conflicting goals: the introduction of competition into all areas of what was once a monopoly industry, and the preservation of universal service to all citizens, regardless of income or geographic location. The key to achieving this balance successfully is the Eligible Telecommunications Carrier.

The goal of providing ubiquitous telephone services (universal service) has been pursued through a monopoly strategy, with LECs receiving an exclusive franchise in return for providing service to all willing subscribers, even those in high-cost areas and those willing to purchase only the most basic of services. Opening up that monopoly market to competition may create a situation in which low-end subscribers and high-cost territories are no longer served. Not only is it probable that competitors will not rush forward to serve high-cost areas, but the incumbent provider (the ILEC) also may

wish to relinquish its obligations to these areas, as well, in order to concentrate its efforts in the more attractive markets. Without regulatory intervention envisioned in the 1996 Act, the low-end services and high-cost territories could, as a result of competition, lose service provision.[64]

The competitive ETC provisions of the 1996 Act can assure that basic services are provided, not a basic carrier or a basic network.

Even with regulatory intervention, and the requirement that a carrier take on the duties of a COLR, there is a danger that the COLR will be relegated to second-class status as the provider of low-end services. The competitive ETC provisions of the 1996 Act can insure that *basic services are provided, not a basic carrier or a basic network.* Several ETCs will share the burden of providing low-end services and services to high-cost areas. The benefits of this approach can be significant. All subscribers will have the benefit of choice, even in markets which would not naturally tend toward competitive provision. Emerging network providers will have the opportunity to develop as full-service providers, rather than serving only niche markets. No network will become the second-class network for rural and low-income subscribers.

All subscribers would have the benefit of choice, even in markets which would not naturally tend toward competitive provision.

This unique approach places a greater burden on the state commissions, which have, in many respects, always borne the responsibility for assuring ubiquitous service provision. State commissions have traditionally granted LECs exclusive franchises. In doing so, state commissions have had the burden of assuring that the franchise holders were capable of providing service and that they met their obligations. In the ETC environment, state commissions continue to have these same duties, but must do so with the added component of competition. Instead of one exclusive franchise holder

[64] This has certainly been the case for transportation. With the deregulation of the bus industry, rural areas very quickly lost bus service.

per nonrural area, state commissions *must* appoint more than one per area. Moreover, state commission must define that area, must decide how many ETCs to designate, and must assure that competitive provision of basic services continues.

In order to implement the ETC approach successfully, state commissions must be aware of several factors:

- the impact of service area size and characteristics on potential ETCs
- the basis on which universal service subsidy payments will be determined
- the need to balance the interests of the incumbent providers with the need to encourage new entrants
- the special needs of rural and poor urban areas
- the number of ETCs which can be expected to provide service within an area
- the unique role the ILEC will play in providing basic services.

The success of the local competition provisions of the 1996 Act will depend on issues of interconnection, unbundled access, and mutual compensation agreements. The success of the universal service provisions will depend on how well the competitive ETC approach works.