TELECOMMUNICATIONS IN HAWAII

POLICY, ECONOMICS, AND THE CHANGING INDUSTRY

A Study Prepared Under Act 331
of the Session Laws of Hawaii 1988

Conducted by

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A Report to the Governor and the Legislature of the State of Hawaii

Submitted by the

Legislative Auditor of the State of Hawaii
Honolulu, Hawaii

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FOREWORD

The report, *Telecommunications in Hawaii: Policy, Economics, and the Changing Industry*, was prepared pursuant to Act 331, Session Laws of Hawaii 1988. This act authorized the Legislative Auditor to have a feasibility study conducted relative to the deregulation of certain telecommunications activities as a means of promoting the growth of the telecommunications industry in the State. It specified a study of three types of telecommunication services (private coin operated telephones, telephone shared tenant services, and interisland telephone service) as well as a study of the issue known as "bypass" in the telecommunications industry.

Our consultants for the study were Economics and Technology, Inc. of Boston, Massachusetts, and Paul, Johnson, Alston & Hunt, Attorneys at Law, of Honolulu, Hawaii. The study specifications prepared by our office instructed the consultants to: (1) provide a general examination of the concept of "bypass"; (2) examine various questions regarding the regulation or deregulation of four particular types of telecommunication services, including alternative operator telecommunication services; and (3) assess these specific types of telecommunication services relative to actual conditions prevailing in Hawaii in terms of what is already being done with these services, what is being proposed, and what is potentially possible.

We join Economics and Technology, Inc. and the law firm of Paul, Johnson, Alston & Hunt in expressing our appreciation to the many individuals, in the private sector as well as in government, who assisted and cooperated in carrying out this study.

Newton Sue
Acting Legislative Auditor
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Executive Summary

The availability of a telephone and the ability to place a call to across the street or around the world are aspects of our modern life that we have come to take for granted. However, telephone service is not what it used to be. Advances in technology are changing the way in which telephone calls are made and the types of services that can be offered over the nation's telecommunications infrastructure. Recognizing that the ongoing changes in the telecommunications industry may have a profound impact on the State of Hawaii, the Hawaii State Legislature has authorized this report, under Act 331 of the 1988 Session Laws of Hawaii, to study issues of regulation and deregulation in the telecommunications industry. Generally, the areas the Legislature asked to have studied include the introduction of competition with Hawaiian Telephone Company (Hawaiian Telephone) in furnishing local and long distance services in the State, the impact of allowing privately owned pay telephones to replace some of the familiar coin telephones around the State and the benefits and drawbacks of allowing several businesses to share a single telephone system.

Hawaii's present treatment of telecommunications activities and its public policy as seen through its regulatory approach are not unlike that of most of other states. Traditionally, a single telephone company was responsible for furnishing local telephone service and for connecting local customers to a single long distance network. The Public Utility Commission had both the authority and the responsibility to regulate all telecommunications activities, ensuring that both quality and price were reasonable. Rates were set so that local service for residential customers was cheap, with long distance and/or business customers asked to pay more to provide the subsidy that was necessary to maintain that rate structure. That is still the case in Hawaii today.

So long as there was a monopoly and there were few choices for advanced services, this structure worked well. However, new technology and the entrepreneurial spirit of the nation's businesses have made the industry more complex by introducing more competition and more choices for telecommunications customers. Fundamentally, each of the issues included in the study raises policy choices for the State between economic development concerns and the basic public telecommunications regulatory policy which has worked to ensure universal telephone service for residential customers. On the one hand, changes to the present regulatory structure may allow more flexibility in the choices of telecommunications services, a change that should ultimately lead to more choices in telecommunications for Hawaii's consumers. On the other hand, the introduction of more competition for Hawaiian Telephone, a natural consequence of increased choices, will force Hawaiian Telephone to re-examine its ability to maintain the subsidy for local service presently built into its rates.

This policy dilemma, along with the role that the Hawaii Public Utilities Commission has in establishing and implementing regulatory policy for a dynamic industry, frames the examination of each specific area. The report examines each of five specific topics identified by the Legislature:

Bypass: "Bypass" occurs when a customer decides to use an alternative to the local telephone company's basic services to complete local calls or to connect to a long distance company. The alternative may be provided by a competing supplier, or (as in many cases) it may be a dedicated line leased from the local telephone company itself. Bypass has not proven to be a significant problem and most telephone companies have experienced strong growth in demand for network

services over the past several years. Under existing Hawaii law, the Public Utilities Commission must regulate any company that intends to offer bypass services to the public. The legislature might consider granting the Commission greater discretion in its regulation of bypass service providers. The legislature might also direct the Commission to keep it informed on future bypass developments to ensure that bypass will continue to have a minimal effect on Hawaiian Telephone and the state's ratepayers.

Shared Tenant Services: One of the new opportunities being promoted by some in the telecommunications industry is the sharing of a single telephone system by several unrelated businesses that are located in the same building or complex of buildings. The introduction of shared telephone systems should provide small and medium sized businesses in Hawaii with access to advanced telecommunications services, only available in relatively new telephone systems, and should offer opportunities to save on the cost of telephone service. Increased efficiency and cost savings will help minimize any impact that shared systems will have on Hawaiian Telephone's revenues from these business customers. Given the appropriate authority and ability to exercise discretion in imposing regulatory requirements, the Hawaii Public Utilities Commission should be able to ensure that customers have unrestricted access to Hawaiian Telephone services, if they so desire, and should prevent shared telephone system operators from abandoning customers without notice. Further regulation of these systems is probably unnecessary and might inhibit the development and increasing choices that these systems would foster.

Customer Owned Coin Operated Telephone Systems: Competition in the provision of private pay telephone service is increasing throughout the country. Hawaii is one of only a handful of states that still prohibit installation of these pay telephones. Competition elsewhere has led to innovations in technology of coin and "coinless" telephones and enhancements in the services and capabilities of pay telephones. Competition would likely bring the benefits of these changes to customers in Hawaii. Given the proper regulatory authority, the Hawaii Public Utilities Commission can ensure that Hawaiian Telephone is not disadvantaged by the entry of additional pay telephone providers.

Alternative Operator Services: The Alternative Operator Services industry is quite new and has stirred considerable controversy elsewhere in the nation. The service, which is generally offered to hotels, private pay telephone operators, and operators of shared telephone systems, is a replacement for the long distance operator service, traditionally offered by the local telephone company, is used by customers making credit card, collect and third party calls. Competing operator companies have been criticized for charging exorbitant rates, for not properly identifying themselves and for not allowing adequate access to local and long distance telephone companies. Hawaii can only directly control in-state activities of such companies but can influence their interstate and international operation through regulation of, among other things, the billing and collection services that Hawaiian Telephone could provide to these companies.

Interisland Services: Hawaiian Telephone's rates for telephone service between islands are maintained high for the purpose of generating a subsidy to support other Hawaiian Telephone services, most notably, local residential service. In spite of these above-cost rates, there appears to be little opportunity for significant competition in the interisland telecommunications market due

both to technological and geographic limitations and to relatively modest demand for these services. However, reductions in Hawaiian Telephone's prices could stimulate demand for service between islands and help improve the economic development potential of the neighbor islands.

To the extent that the Hawaii, through its public policy, can encourage the growth and development of the basic telecommunications infrastructure and of state-of-the-art telecommunications facilities, all of its residents will enjoy improved opportunities. Hawaii's attractiveness as a business location will be enhanced, and its residents will become part of the "information rich" of the nation. Conversely, if state policy limits available services or acts as a disincentive to innovators hoping to expand telecommunications opportunities, Hawaii will be correspondingly less attractive to new business development, existing businesses will find it more difficult to grow, and residents generally will have less access to advanced telephone services. Nevertheless, setting policy to encourage the growth of the telecommunications industry must be done with care to ensure that both economic development goals and public policy goals of ensuring universal telephone service are met. Moreover, all branches of government must play a role in setting and implementing these twin policies. To meet the challenge, the State must be equipped with a clear vision of its policy goals and with a regulatory system that is both strong and flexible.

Chapter 1

Introduction

Origin

This Report was authorized by the Hawaii State Legislature through Act 331 of the Session Laws of 1988, approved by the Governor on June 13, 1988. The Act called for the Legislative Auditor to oversee a "feasibility study regarding the deregulation of private coin-operated telephones, telephone-shared tenant services, and interisland telephone service and for a study on the issue known in the telecommunications industry as 'bypass'". The accompanying Committee Report No. 2668 noted that "[i]n light of the State of Hawaii's desire to become involved in the telemarketing and high technology industries, it is imperative to gauge the effect deregulation of these services will have on the provision of communication services generally in terms of service level and rate structure."

Objectives

Hawaii, located at the center of the rapidly growing Pacific Rim, has an excellent opportunity to use the existing and planned international telecommunications infrastructure to become a hub of economic development within the Pacific. One might question whether examination of regulation of telecommunications in the State, whose jurisdiction is confined to activities that occur solely within the State, relates to economic development of activities in the Pacific basin. There is indeed a relationship. Were Hawaii to function as an international telecommunications hub, there would certainly be substantial need for facilities to the mainland U.S. and international facilities to Pacific Rim countries. Jurisdiction over these facilities is held by the Federal Communications Commission (FCC) and not the Hawaii Public Utilities Commission (PUC). However, State regulatory policies can make it more or less difficult and costly to develop the local infrastructure necessary to interface with international and mainland U.S. facilities. Hence, the climate for development and use of facilities within the State may ultimately either facilitate or detract from Hawaii's international role as a Pacific Rim telecommunications hub. If it is difficult or impossible to carry on communications activities within the State, international entrepreneurial activities could be severely hindered.

On the other hand, there may be existing societal objectives that would be affected by any new policies designed to promote economic development through an enhanced telecommunications infrastructure. In particular, the United States and the State of Hawaii both have a long history of promoting pricing policies for telephone services that keep rates for residential customers relatively low. This objective is achieved by maintaining relatively higher rates for other services, most notably long distance and business services. The introduction of competition into certain areas of Hawaii's telephone service could reduce the power of Hawaiian Telephone Company (referred to in this report as Hawaiian Telephone) - Hawaii's only provider of land-based local telephone service - to maintain a rate structure that relies in part upon business and long distance customers to subsidize basic local residential telephone service.

The objective of this study, therefore, has been to examine economic development opportunities in Hawaii that might be fostered by changes in the telecommunications industry and its regulation, while measuring any potential consequences that such changes might have upon traditionally protected services and ratepayers. The study's authors interviewed dozens of key participants in the telecommunications industry in Hawaii; reviewed Public Utilities Commission proceedings, legislation, and court decisions, along with information provided by Hawaiian Telephone Company and numerous private sector sources; analyzed rate, cost, demand, and revenue data regarding existing telephone service markets in Hawaii; and surveyed policy initiatives and market conditions throughout the remainder of the United States to assess Hawaii's telecommunications industry. Rather than arrive at definitive recommendations for regulatory or legislative action, the authors' goals were to provide an array of policy options in each of the subject areas identified by the legislature, and analysis of the likely impacts of adopting each option.

Scope and Organization

This report first addresses the relationship between telecommunications and economic development and the legal and regulatory framework applicable to the telecommunications industry in Hawaii. Using this as a backdrop, the report then looks at the five specific subject areas identified by the Legislature and the Legislative Auditor, and examines the tradeoffs between public and private interests, as well as mutual opportunities for growth, that are inherent in each area. Following is a summary of the approach to each subject area.

1. Bypass. "Bypass" is a term used to describe the use of telecommunications facilities other than those of the local telephone company, or, in some cases, use of one set of telephone company services in place of other, more traditional services. The concept generally embraces the essential confrontation between competitive forces and the existing monopolists. In this context are raised questions concerning whether the loss of business by a monopoly telephone company leads to lower revenues, and thus lower subsidies and higher rates for the monopoly's remaining captive customers. We examine this issue in its general national framework, and how it applies to Hawaiian Telephone and its ratepayers.

2. Shared Tenant Services. An important area of debate involves the emergence of telecommunications operations that offer services on a shared basis to tenants of business or residential complexes (in Hawaii designated as Common Premises Communications Systems, but more commonly known as Shared Tenant Services or STS). Through shared systems, small and medium sized businesses, and even residential consumers, are able to obtain access to new and specialized telecommunications capabilities that have previously been available only to larger, more wealthy corporations with highly concentrated communications needs. By introducing shared tenant systems, however, developers and entrepreneurs may risk exacerbating the perceived rift between those who have been called "information rich" and "information poor." This could occur especially if development of shared telephone systems took place at the expense of Hawaiian Telephone's existing revenue and customer base. On the other hand, our analysis discusses the fact that the incentives and growth fostered by access to low cost telecommunications may be more likely to *enhance* the opportunities for bringing advanced communications to more people sooner.

3. Customer Owned Coin Operated Telephone Systems. Competition in the provision of public coin telephones (Customer Owned Coin Operated Telephone Systems, or COCOTS) involves similar tradeoffs. This industry has been increasing rapidly in many parts of the United States. Public pay telephone service is only partially an "essential" service, and in some ways more of a "luxury." Our analysis examines where there may be room for improvement and the introduction of more options for pay telephone service through competition, and whether changes in the character of this industry might lead to unnecessary cost burdens or other problems.

4. Alternative Operator Services. Alternative Operator Services, provided to telephone customers in hotels and other public establishments as well as to consumers at home, are largely invisible to the caller, and thus carry an exceptional risk of exploitation and abuse. There has been considerable publicity concerning this issue recently, much of it adverse. The report looks into whether public oversight of competition in these areas can protect the public interest from the possible excesses of newly developing markets.

5. Interisland Services. The interests at stake in the market for interisland services include the public at large, but in particular that segment of the public that lives on the outer islands. Those neighbor island customers may see interisland telecommunications as a connection to the economic base of the State, and thus their best opportunity to enjoy the benefits of technological and economic development. We examine the existing rate and subsidy structure, and investigate whether greater incentives to communicate between the islands can lead to increases in service volumes, revenues, and economic activity that yields net benefits to the State as a whole, and to the neighbor islands in particular.

Chapter 2

Background

Telecommunications and a Changing Society

The authors of this study have sought throughout to examine the conflicts and confluence between traditional economic development and public policy objectives, on the one hand, and the unique demands and opportunities associated with the emergence of telecommunications as a fundamental resource in a changing society. Telecommunications is not a "natural" resource whose exploitation is governed by the laws of nature and the limitations of a finite planet, but rather a part of the man-made infrastructure, a conduit through which *information*, the most basic and unlimited natural resource, is transmitted. As information and knowledge are a public good, endemic to all individuals, we have come to see the means of obtaining, storing, and sending information as a basic component of human needs: food, shelter, clothing, energy, and a telephone.

Government policy in Hawaii concerning telecommunications, as elsewhere, has incorporated this principle, producing a regulated monopoly utility (Hawaiian Telephone Company) that provides simple, basic telephone service to all citizens at affordable prices. The march of technology, however, has long since moved past the era when a crackling voice on a hand-held receiver was the sole product of the web of wires and switches that make up a telephone system. Telephone regulation policies aimed at merely retaining the *status quo*, without recognizing the vast changes that have occurred in the industry, would be anachronistic at best. Indeed, re-evaluation of the regulatory frameworks applied to telecommunications has been increasing steadily throughout the country, as technological and market forces have continued to alter the shape of the industry, and of society itself.

This re-evaluation, however, including that embodied by this report, need not result in a simple dichotomy between "regulation" and "deregulation." For the most part, the basis for instituting regulatory oversights in the telephone industry remains, but there are potential variations in the degree and scope of regulation which could help improve the efficiency of the market and could allow new participants in certain service areas to introduce innovation and growth that might otherwise be hindered. Most states have not chosen to simply deregulate some or all telecommunications services and service providers. Many have, however, concluded that their regulatory bodies can and must exercise increased discretion formulating and applying regulatory requirements. Evolution of the public policy context along these lines has been the dominant theme in telecommunications regulation in the U.S. in recent years.

Technological and Regulatory Developments

The telecommunications industry is among the most complex - organizationally and technologically - of all major U.S. industries, and the dynamics of its component markets can be affected in countless ways by government action. The most dramatic changes in telecommunications policy in the United States have had to do with the break-up of the AT&T monopoly. Since 1984, the divested Bell Operating Companies have been subject to explicit requirements as a result of the

federal government's antitrust settlement with AT&T. Although GTE, the owner of Hawaiian Telephone, also settled an antitrust suit in order to purchase a long distance company (US Sprint), the specific restrictions on the GTE Operating Companies, including Hawaiian Telephone, were less extensive than those for the Bell telephone companies. Still, many of the trends apparent elsewhere will also be found in the industry in Hawaii, and the directions in regulatory policy also might be applicable in the State.

One of the most visible effects of evolving telecommunications policy has been the opening up of the markets for long distance services and telephone equipment to new competition. In 1984, the *Modification of Final Judgement (MFJ)* split the former Bell System into AT&T, primarily a long distance and equipment provider, and the Bell Operating Companies, the local telephone companies. This decision restricted the local telephone companies to the provision of local telephone service and a limited amount of long distance service within areas called Local Access and Transport Areas (LATAs). By contrast, AT&T was allowed to provide the long distance service (service between LATAs) that the local telephone companies were strictly prohibited from offering. While the local telephone companies retained their monopolies on local service, the provision of long distance service was specifically opened up to competitors. This reorganization under the *Modification of Final Judgment* has successfully encouraged the development of a competitive long distance market and recognized the franchised telephone companies' continued monopoly at the local level.

The policy to open up the markets for telephone equipment, telephone sets and the like, evolved prior to the break up of the Bell System. Here, the Federal Communications Commission determined that, as a matter of federal policy, consumers would be better off if many companies were allowed to sell telephone sets and other equipment, as long as the equipment met certain technical standards. As in the long distance market, the changes imposed on the equipment markets have led to the rapid growth of competitive supply in this area.

The convergence of several lines of technological progress and intensive network modernization programs being undertaken by the major telephone companies, has led to the appearance of innovative technical capabilities in a whole new array of sophisticated service offerings. At the same time, new telecommunications technologies are in most areas pushing the costs of service downward. For example, telephone company modernization programs will place both local and long distance telephone companies in a position to enjoy significantly reduced operating expenses for the next several years as newer, more efficient telephone switching equipment is put in place. Telephone industry data indicates that local switching costs may decline by over 7% per year.[1] Similarly, unit costs for transmission facilities are declining at an even faster rate than switching because of the rapid deployment of fiber optic cable facilities. (Fiber optic cable is cable made from glass fibers, and it can carry vastly more telephone traffic than standard copper wires.) The cost of installing and using fiber optic cable has been undergoing a dramatic decline of roughly 15% per year, while technical improvements have expanded the capacity of operational fiber optic cable systems by a factor of thirty-six since 1980.[2] Together, it is projected that these factors will permit telephone companies that have deployed fiber to accommodate future growth in telephone calling at almost no incremental cost.[3]

Innovation has also created alternative technologies for telecommunications services. An increasing number of new technologies have been developed that can be used as alternative means to fulfill certain communications needs outside of the realm of the traditional telephone company's services. Some of the market areas covered by this study, such as private coin telephones, shared tenant services, and some instances of "bypass," fit this category.

While these innovations represent a significant industry development, the existence of alternative distribution technologies is not a demonstration that traditional local telephone services are facing widespread new forms of effective, sustainable competition. In fact, despite these technological developments, the fundamental monopoly of the local telephone companies has changed very little, and is unlikely to erode in the near future since it is rooted in the natural economies of scale and scope enjoyed by the large telephone companies. These advantages are inherent to the local companies' possession of a key resource, a widely distributed and interconnected telecommunications network. The public local telephone network is the only way of providing distributed communications without requiring massive investments in duplicate facilities; moreover, this resource can be deployed with unmatched flexibility to furnish more specialized communications, since in most cases the needed transmission path could follow the telephone company's existing routes and rights-of-way.

Regulatory Roles in Response to Competition

The leading source of the growing interest in regulatory reform is the perception that competition has entered the telephone market as a natural and inevitable outcome of technological progress and the removal of legal barriers to entry. In light of the various degrees to which telephone service markets can in fact accomodate competition, policymakers have had to develop specific criteria for assessing the extent of competition in a market and the degree to which any competition that exists can complement regulation as a means to maintain acceptable market conduct. Without established criteria for what constitutes a valid "competitor" or "market," the definition of either term can become overgeneralized. Consequently, regulators and legislators in at least seventeen states have been using objective standards to assess competition. Table 2.1 provides a summary of the criteria employed in these states for evaluating competition in telephone markets. Among the most important criteria are:

- The number, size, and geographic distribution of alternative providers of service.
- The ability of alternative providers to make functionally equivalent or substitute services readily available at competitive rates, terms, and conditions.
- The financial condition of the firms providing the functionally equivalent service in the relevant market.
- The existence of any significant barriers to the entry or exit of a supplier of the service in the relevant market.
- The dominant telephone company's market share, the ability of the market to hold prices close to cost, and other economic measures of market power.

- Additional factors that may affect competition.
- Additional factors that affect the public interest.

Table 2.1

Factors Used by State Regulators to Evaluate Competition

State	AZ	CO	FL	GA	IA	IL	MI	MN	MT	ND	NM	OR	UT	VT	VA	WA	WI
Year Established	88	87	85	88	84	86	87	87	85	85	85	85	85	87	84	86	86
Universal Service/Other Primary Public Interest	*							*					*				
Other Factors Relevant to Public Interest		*	*						*			*	*		*		
Number, Size, Geog. Distr. of Alt. Providers	*	*	*	*		*	*	*	*	*	*	*	*		*	*	*
Alt. Providers offer Functionally Equivalent Svcs.	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*	*
Barriers to Market Entry/Exit	*	*					*				*	*	*	*		*	*
Market Share/Other Market Factors	*	*					*	*		*			*	*		*	*
Effects on Other Carriers' Rates		*	*						*				*	*			

Source: Telegis database of state regulatory actions, Project Telegis, Michigan State University [1988]

Taken together, these criteria provide a workable framework for an objective assessment of market competitiveness. Given these guidelines, a particular regulated service and market may well prove sufficiently competitive to permit some form of "flexible" regulation to be employed. On the other hand, it is likely that very few services furnished from a dominant telephone company's network will be determined to be competitive enough to render regulatory oversight unnecessary.

Problems can arise when telephone companies are allowed to depart from the traditional cost of service standard, and their severity is closely related to the ability of competition to discipline dominant service providers. When a dominant telephone company is not restrained by market forces or regulatory oversight, it will have the ability and incentive to raise prices and realize monopoly profits. Moreover, such companies will have no incentive to share any cost savings resulting from improved economic conditions or technical innovations with consumers.

When prices are not held to costs or some other stable standard, telephone companies will have the opportunity and incentive to engage in *strategic pricing,* setting rates so as to discriminate between different classes of customers or altering the pricing relationships between services to maximize the use of particular offerings. These practices can further a number of strategic goals. Customers can be compelled to shift to those services with higher profit margins, such as metered-use rather than flat-rated services. The services targeted for such migration might also afford marketing intelligence such as increased knowledge of a customer's operations.

Another important issue for policymakers is to ensure that telephone subscribers receive a fair portion of the benefits of future productivity improvements achieved by the telephone companies. Under the traditional cost-of-service standard for determining rates, regulators would be able to ensure that ratepayers benefit from advances in productivity, by ordering new rates based on the telephone companies' lowered operating costs. In a truly competitive market, customers would likely see the majority of these cost savings: When only one company implements a technology with lower costs, it reaps the benefits in higher profits until its competitors follow suit, after which the market price falls to a new equilibrium level that reflects the technological advance. However, in a market without sufficient competitive or regulatory price constraints, the dominant telephone company is free to simply retain the cost savings as additional monopoly profits.

Principles of Regulation in the New Environment

The introduction of new service offerings has been rapid and will continue to accelerate. When considering these offerings, a distinction must be made between "new" offerings that are principally a repackaging of existing offerings (through the repricing or bundling of older services, for example), and those that offer truly innovative features and functions and specialized terms and conditions. Superficially "new" services are often created for marketing purposes or in order to alter established tariff obligations and pricing restrictions. If new services are summarily exempted from regulatory oversight, over time it is possible that the majority of a dominant telephone company's captive customer base would lose its regulatory protection, particularly if the telephone company's discontinuance of existing services is not also carefully regulated. Regulators can address this concern by developing standards for new service filings, including a requirement that any new offering must provide a substantially new feature, function, or benefit to customers.

In order to decide the degree of regulatory oversight truly innovative services will require, the central question is to determine their place in the emerging information infrastructure. Services that are expected to play an integral role in the national network as it evolves to better accomodate the transmission of data, in addition to voice traffic, will clearly require regulatory safeguards. These new services include those that will result from the implementation of the Integrated Services Digital Network and Open Network Architecture - two new technological and regulatory developments that are intended to allow for improved data communications. In addition, however, there are new services that are likely to become key components in the *economic* infrastructure supported by information technology. For example, electronic data interchange (EDI) capabilities have been cited as potentially crucial to the revitalization of the American steel industry.[4] These services must be protected as well to prevent market abuses that could stifle economic growth.

The regulatory process has frequently been criticized for being expensive and administratively slow. Although improvement would be welcome in both areas, it should be borne in mind that the direct costs of regulation are actually quite small in comparison to both the total revenues generated by the telecommunications industry and, perhaps more important, the magnitude of consumers' potential losses if regulatory protections were to be eliminated. Furthermore, the regulatory review of tariffs and cost support could be greatly speeded up without relaxing regulation by the industry-wide adoption of automated data collection and public reporting systems. Finally, regulators can also streamline the review of new services without sacrificing thoroughness by developing widely applicable, principled standards for new tariff filings and their review.

All of the regulatory roles outlined above ultimately must converge in a continuing role for state regulators, working with regulated companies and ratepayers, to help define the public interest in telecommunications services. While this role is an evolution of the traditional function of economic regulation, it is heightened by both new technology and the increasing use of telecommunications and information services in our society. In contrast to some views of a shrinking public utility role, many in the industry see the public utility role of the local telephone company as *expanding* over the coming decades to encompass many new types of information transfer.

The key role (and challenge) for the local telephone company over the next few decades will be to build and maintain the low-cost, ubiquitous distribution system that is essential to the viability and growth of traditional telephone services, and new "Information Age" services. While the technology may be revolutionary, the goals for an "information gateway" (i.e., universal access, reliability, and affordability) are an *evolutionary* outgrowth of those goals already achieved for the voice communications "gateway" represented by traditional dial tone access to the public switched network.

Regulators historically have had a responsibility to *all* sectors of the public that are affected by the availability of efficient and versatile telecommunications services. As this resource evolves into a comprehensive information utility and takes on an even greater role in the economy, policymakers will have to become even more vigilant to ensure that this resource is managed wisely.

Notes

1. For 1982-86, the annual rate of decrease for local switching costs (dollars/line served) was 7.6%. Source: USTA data, presented in Lawton, R.W., "Telecommunications Modernization: Issues and Approaches for Regulators," National Regulatory Research Institute, Report number 87-14, January 1988 - Fig. 1.6, p. 22.

2. R.J. Sanderrare, "Terrestrial Lightwave Systems", *AT&T Technical Journal*, Volume. 66, January/February 1987 - p. 100.

3. "Fiber Deployment Update - End of Year 1987", Industry Analysis Division, Federal Communications Commission Common Carrier Bureau, *op. cit.*

4. L. Arnheim, "Telecommunications Infrastructure and Economic Development in the Northeast-Midwest Region", Northeast-Midwest Institute (April 1988) - p. 9.

Chapter 3

The Role of Telecommunications in the Hawaii Economy

Economic Development and the Role of Telecommunications

Governor Waihee has proclaimed 1988 the Year of Telecommunications in Hawaii. This proclamation encouraged development of telecommunications resources that would promote the use of Hawaii as a hub for economic activity in the Pacific basin. The Governor noted that the Pacific basin is among the most rapidly growing economic areas of the world, and he further noted that Hawaii is ideally suited both by geography and interest to develop a central role in these activities, a role that is grounded in large part on the availability of appropriate telecommunications capabilities based in the islands.

The Governor's message is that participation in Pacific basin activities will lead to economic development and growth of opportunities within Hawaii and that telecommunications resources are vital to the success of this strategy. While the proclamation focused on international activities in the Pacific basin, the conclusion for development of other economic activities in Hawaii is similar. Assuming that there is a goal in Hawaii to promote additional economic opportunities for citizens of the State beyond the traditional areas of sugar, pineapple, and tourism - and that is a clear message from both public and private sector leaders - the new (to Hawaii) activities will undoubtedly either be telecommunications-based or rely heavily upon telecommunications services as part of a broader activity. In addition, expansion even in the traditional economic bases of Hawaii will be both driven and facilitated by improvements in the availability of telecommunications resources in Hawaii. As Senator Daniel K. Inouye commented at the *Governor's Symposium on Telecommunications Now and in the Future*, "Telecommunications is more than an infrastructure: it is the heart of every developed economy on this planet."

Telecommunications will play a major role in economic development in Hawaii for several reasons. First, major economic expansion is likely to occur in high technology-type industries, not in the smoke-stack and/or manufacturing sectors. No one would seriously suggest that the latter industries would be appropriate for expansion here in the islands. Hawaii's great distance from both the mainland U.S. and Asia, as well as its natural resources and natural beauty, make capital-intensive, heavy industries that generate products to be shipped to distant markets impractical, uneconomic and undesirable for Hawaii. Conversely, it is precisely the portability of many functions in the high tech sectors, which is accomplished using telecommunications resources, that makes it possible and desirable to locate such activities in the State. For example, software development need not take place in any particular location since ideas, innovations and software can be transmitted to another location over telecommunications facilities. Similarly, scientific research requiring input data need not be conducted at the site at which such data is collected. High speed digital facilities allow for the accurate transmission of data from the site where it is collected to the place where the analysis will be done. This is already the case with data collected at observatories on the Big Island, which are transmitted for analysis to locations half way around the world.

In addition, developments in telecommunications are improving the efficiency with which all businesses can operate. For example, telecommunications systems have been developed to allow merchants to quickly and accurately verify the validity of a credit card used to make a purchase. Thus, telecommunications innovations directly contribute to increased sales for merchants and, hence, growth in the retail sector. Another example can be found in cellular radio telephone service. Unlike traditional mobile telephone service, a cellular system can support many calls on each available transmission channel thus greatly expanding the number of calls - and the number of customers - that can be served by the system. This expansion of the availability of mobile communications services has undoubtedly increased the efficiency of operation of agricultural enterprises by improving communications with workers in the field.

The interests of economic development must, however, be balanced with the public policy interests in maintaining affordable local telecommunications service for Hawaii's residents. The question most often asked is whether the development of the telecommunications infrastructure will require that basic residential customers pay more for their basic telephone service. For example, if new technology is deployed to meet the more sophisticated business needs, will those modernization efforts be paid for by the businesses which use them or will the cost of these improvements be borne by ratepayers generally, including residential consumers? A related question, if competition is allowed for some services, for example, through a Shared Tenant Service arrangement, will Hawaiian Telephone lose money and be forced to raise residential rates to make up for a lost subsidy? While concern about residential service costs is generally focused on local telephone service, residential consumers also use long distance service, and therefore decisions regarding subsidies among different telecommunications services have a complex impact on residential customers. Decisions to promote economic development through improvements to the telecommunications infrastructure or through increased competition (which could require Hawaiian Telephone to restructure some rates) certainly will affect residential consumers and must be made consistent with social policy goals. Market entry, competition, and/or deregulation, however, need not automatically result in disadvantages to Hawaiian Telephone and its customers, as evidenced by the considerable benefits Hawaiian Telephone continues to enjoy in the relatively unrestricted realms of overseas communication and telephone equipment sales.

All businesses, whether old or new, high tech or traditional, utilize and depend upon telecommunications services in a variety of ways. Growth of businesses can be enhanced by improving and expanding the quality and extent of telecommunications services available. To the extent that the telecommunications infrastructure can support a spectrum of telecommunications services, particularly state of the art applications, Hawaii's attractiveness as a business location will surely be enhanced. Conversely, if state policy limits available services or acts as a disincentive to innovators hoping to expand the telecommunications infrastructure, Hawaii will be correspondingly less attractive to new business development, and existing businesses will find growth more difficult. Such policies must be set with care so as to ensure that economic development goals do not eclipse the social policy of affordable local residential service. Both economic development and universal telephone service are important to Hawaii. The challenge is to modernize telecommunications policy while balancing these interests.

Telecommunications Activities in the Private and Public Sectors

As an initial approach to the assignment of reporting on competition and deregulation of telecommunications services in Hawaii, the project team identified and interviewed key individuals in Hawaii with interests, either direct or indirect, in the telecommunications industry. We found considerable telecommunications-related activity in Hawaii in both the public and private sectors. Some participants are interested in expanding and improving existing activities by utilizing new telecommunications services. Others are planning economic development activities that depend upon availability of a state of the art telecommunications infrastructure. Still others are devoting resources to ensuring the continued availability of high quality, low cost telephone service for all residents.

Since many have long viewed Hawaii as a difficult place to accomplish innovative tasks, the breadth and quality of the proposed activities were somewhat unexpected. The interviews were not intended to produce a statistical picture of the present use of telecommunications services in Hawaii. Rather, the intent was to determine whether there were people in Hawaii whose activities required or assumed an expanded and enhanced telecommunications infrastructure. We discovered a wealth of ideas and activities, which are summarized below.

The Private Sector. Private telecommunications activities in Hawaii can be divided into two areas: (1) those that are telecommunications-based themselves and (2) those that have telecommunications services as important inputs. Activities in the former category that have been cited as having potential for growth in Hawaii include: services offered through shared local telephone facilities, private pay phone and other long distance services, operator services, and telemarketing activities. On the other hand, many of the specific economic development activities that have been cited as potential areas of growth for the State fall into the latter category. For example, the development of research and development parks and a hub for Pacific basin financial activities would depend upon availability of a state of the art telecommunications infrastructure. All of these activities have their proponents in the community.

Use of Shared Local Telephone Equipment and Dedicated Facilities: Many different types of business are interested in expanding their services for their customers through the use of shared local telephone facilities. A small (in comparison with Hawaiian Telephone's facilities) telephone system that is used by a business customer to provide telephone service *within* his building or offices and to connect to the public telephone network is called a "Private Branch Exchange" or "PBX." The sharing of this common system by multiple, unrelated tenants is the fundamental basis of Shared Tenant Services. Instead of restricting the use of the system (the PBX) to a single business, all of the tenants of a building would share the system and would use common lines through the PBX to get into to the telephone network. Proponents of this concept in Hawaii cite benefits such as more efficient use of local telephone facilities and the opportunity to offer small business tenants sophisticated, value-added telecommunications services, e.g., "voice mail" (electronic answering machine) services, that are only available in sophisticated, new telephone systems. In some instances, for example, in a medical group facility, a common telephone system within a building would permit tenants with common interests, in this case doctors, to communicate among themselves without using local telephone facilities. For this group of tenants, the shared system offers shorter

dialing arrangements and reduced delays for calls between tenants, in addition to the value-added services that can be supplied through the technologically-advanced system. At the present time, this mode of telecommunications service is not permitted in Hawaii.

One major hotel owner would like to use a sophisticated telephone system, including a PBX, to link hotels all over the state. He was particularly interested in expanding the opportunities for use of the new technology that is available in modern telephone systems. He discussed the advantages he could achieve in the structure of his telephone services for guests if he were able to use a centrally located telephone system to serve his hotels. First, he could add to the services available to hotel guests. Guests could have access to value-added services such as voice mail and improved opportunities for data communications (for example, using a lap-top personal computer) if the hotel room was served by a new PBX. Second, the telephone system (which is essentially a specialized computer) could be programmed to maximize the efficiency of the hotel group's use of long distance services by identifying the lowest cost carrier for specific long distance calls.

Finally, the centrally located facilities would allow the owner to structure the hotel's guest operator services much more efficiently. With a centrally located telephone system, which would be connected to each hotel with dedicated lines, the hotel group could improve its call answering capabilities. Calls to guests at the hotel could be routed to one or several locations where they would be answered. The routing instructions could be changed based upon any number of conditions. For example, during slow periods, calls could be routed to a central location. In addition, during peak calling times, there might be several operator locations where calls were answered. If any location were particularly busy, the telephone system could be programmed to identify a location that was not busy and to switch the overflow calls to that second location. Sharing the answering responsibility in that manner would permit more efficient use of the operators' time, make it easier for operators to take breaks without leaving telephones unattended, and allow the hotel to minimize delay in answering calls without adding additional operators.

The owner was not certain that his ideas for innovation in his hotel telecommunications network could be implemented at the present time. Since his hotels have a single owner and are, in any case, exempt from the restrictions on resale of local service in the Hawaiian Telephone tariff, a prohibition on Shared Tenant Services might not preclude this use of a shared telephone system. However, the owner was deterred from linking his hotels via dedicated telecommunications channels by cost and logistical difficulties. He has found Hawaiian Telephone's prices for the necessary dedicated circuits prohibitive. The process of installing the facilities on his own, while much less costly, is difficult and time consuming. Rights-of-way between hotels must be secured, but in some cases those which already exist, for example, those held by Hawaiian Electric Company, are not permitted to be used for telecommunications facilities because of decisions by the Hawaii Public Utilities Commission. Moreover, he has found that, because there are limited opportunities to install alternative facilities, there are few companies in Hawaii who are interested in this business. In sum, his experience was that existing regulatory and pricing policies in the State make it difficult for him to innovate and improve the use of telecommunications services in his business.

Operator Services: A long distance company based in Hawaii is one of the few alternative long distance carriers to offer both live and automated operator services to its customers. It has its operator service center located in downtown Honolulu. From this location, the long distance company furnishes its customers with credit card, person-to-person, collect and other operator assisted functions. It designs and builds its own hardware for a personal computer that performs the automated function and switches a call to a live operator when necessary. The long distance company has been successful in marketing this service and the size of its operator force (both live and automated) is expanding. While the company has considered moving some of its operator services functions either elsewhere on Oahu or to one of the neighbor islands (to reduce costs and participate in developing the neighbor islands), the difficulties in obtaining dedicated facilities necessary to connect the operators to the long distance network are a significant deterrent. The long distance company finds Hawaiian Telephone's rates for service between islands high, and there are few options for alternative services.

Telemarketing: Telemarketing has often been cited during discussions of telecommunications-based activities that might reasonably be developed in Hawaii. Telemarketing is the marketing of products or services to customers over the telephone. Some telemarketers initiate calls to potential customers, a practice that is coming under increasing criticism as more and more people are bothered by these unsolicited calls. However, telemarketing also involves *receiving* telephone orders from customers calling voluntarily in response to ads seen in magazines, newspapers or catalogues or heard on the radio or on television. The time differential between Hawaii and the mainland U.S. is such that it is possible that calls to Hawaii to 800 telephone numbers will receive time-of-day discounts, thus substantially reducing the cost of the telemarketing activity. In addition, telemarketing activity is not tied to any particular location, either in the State or in proximity to the potential customers.

Proponents of the activity cite impressive growth figures for the industry and good earnings for successful salespeople as additional benefits. On the other hand, the vast majority of the calls for this activity would come from the mainland. At the present time the only long distance telephone lines between Hawaii and the mainland terminate on Oahu. Thus, a telemarketer who set up his business on one of the neighbor islands would have to buy dedicated telephone lines between that business location and the long distance telephone facilities on Oahu. Consequently, the attractiveness of locating a telemarketing business on one of the neighbor islands will be influenced by the cost of these lines, and high rates for dedicated channels will limit the growth of this option.

Private Pay Phone and Long Distance Services: One of the most unusual activities that was discovered involves access to long distance service in Hawaii. The federal government has provided the personnel on one of Hawaii's military bases with a service center for long distance calls. The caller goes to the center and gives an attendant the number to be called. The attendant places the call and delivers it to the caller in a booth at the center. The caller pays the attendant for the charges for the call upon completion. This system was common in Europe before many households had telephone service. In many countries, the Post Office (or more accurately, the "Post, Telephone, and Telegraph") still has these arrangements for making telephone calls.

For the servicemen and women in Hawaii, the telephone bureau offers the opportunity to make long distance calls to the mainland at prices below those that would be charged for credit card or collect calls. It is our understanding that the center offers calling to the mainland U.S. and international destinations only and is thus not subject to the jurisdiction of the Hawaii Public Utilities Commission. Thus far, it appears to have met a specialized need for armed services personnel, although there may be wider interest in this activity.

Infrastructure for High Tech Research and Development: A major part of the business community's economic development efforts has been directed toward promoting growth of high technology research and development activities in the islands. There is already a base of such activities, particularly on Maui and the Big Island. On Maui, the University of Hawaii and a private firm (under contracts with the federal government) operate research programs at observatories located on Haleakala. On the Big Island, Mauna Kea is home of some of the nation's most sophisticated astronomical facilities, and the energy industry is exploring renewable sources of energy on land and in the sea. These scientific communities make use of a variety of telecommunications facilities, including the use of satellite ground stations to transmit data to remote locations for analysis.

Other neighbor island research facilities have considered use of satellite facilities for data transmission in the past but have had limited success because earth stations were not available on their island, and Hawaiian Telephone was unable to furnish high speed data links to Oahu. Limitations on high speed data transmission and the lack of availability of digital facilities between islands have posed some of the most serious difficulties for the research community, since without adequate data facilities the researchers cannot send data to Oahu and, from there, out of state. While some have solved the problem with privately-owned earth stations, this solution is not always cost effective. Hawaiian Telephone has been working to upgrade its facilities, which has also helped the research community. Continued growth of these research communities is dependent upon their continued ability to move data either around the state or around the world, a function that requires access to a state-of-the-art telecommunications infrastructure.

On Maui, links between the facilities on Haleakala and the research and administrative offices located in the central valley have presented problems. Until recently, the analog microwave capacity between the central valley and the observatories was inadequate to meet needs at the observatories. Fiber optic cable would provide an excellent transmission medium to meet both data and voice transmission needs between the observatories and research facilities; however, installation is difficult because of right-of-way and construction issues. Digital microwave offers another alternative, although cost considerations have precluded this option thus far.

The business community is also engaged in efforts to expand the research and development activities in Hawaii. The Maui Economic Development Board, with State sponsorship, is developing a research and technology park on Maui that would provide space for high tech projects and entrepreneurial ventures. The project developers hope to make the space attractive to potential tenants by providing appropriately equipped space. The telecommunications infrastructure is one important component of the services to be offered. The project developers may install fiber optic facilities inside the Park and plan to offer tenants "hassle free" telecommunications service that would include local features such as call forwarding, voice mail or messaging services, and

three-way calling as well as state of art networking capability for both voice and data transmissions. A prohibition of Shared Tenant Services would limit the Park's flexibility in obtaining these services, possibly making the venture less attractive to potential tenants. In addition, the Park's ability to offer networking capability will depend upon its ability to interconnect with state of the art facilities off the Park's boundaries. If State policy has discouraged development of the public telecommunications infrastructure, the Park may find it impossible to meet its goals for telecommunications services.

The Public Sector. A review of the telecommunications-related activities that have been occurring in the public sector leaves no doubt that telecommunications has been moving to the forefront in the minds of many decisionmakers. As with the private sector, there is an abundance of ideas and projects. Several branches of the State government have been actively pursuing new telecommunications ventures, at the same time that the State is articulating detailed plans for future development of its telecommunications and other information resources. Additional initiatives have been taken by county and municipal governments, most notably the City and County of Honolulu, while the U.S. armed forces and other federal agencies located in the state continue to have a significant impact upon the climate for telecommunications in the state. Finally, the University of Hawaii and its colleges have been among the most active organizations in the State in implementing systems designed to utilize advanced telecommunications capabilities, both to satisfy the needs of specialized research and to fulfill their broader educational objectives.

State government initiatives: The Department of Budget and Finance recently issued a comprehensive strategic plan for the management and future development of the State's information resources. As part of this plan, the Department outlined an agenda for development of the State's data communications capabilities. One major objective will be to integrate the separate data networks operated by various State agencies into a centrally managed, statewide network. This step should improve inter-agency coordination and permit the rapid growth of the State's data communications requirements to be better managed, as well as reduce operating costs and simplify the procurement process. In a second form of integration, the plan calls for greater use of sophisticated high-speed lines and multiplexing equipment that can aggregate data traffic from several locations and transport it more efficiently than could separate, low-speed lines. At the same time, the Department intends to examine whether the use of ordinary phone lines to "dial-in" to State computer facilities could be complementary to a more integrated network, which indicates that the plan is appropriately focused on meeting the current and projected needs of users, rather than focusing on new technology for its own sake. As a long-term objective, the Department foresees a transition to a digital network as a means of accomplishing its aim of providing "fast, reliable, and efficient" data communications for State agencies and decisionmakers who critically depend upon the government's information resources.

As part of the Governor's telecommunications agenda, the State Department of Education has received an initial $540,000 appropriation for the Distance Learning Technology (DLT) Project. Distance learning involves the use of video and other advanced telecommunications technologies to extend educational resources to remote schools and other locations. The DLT project is actually a cluster of eight existing and planned activities, many of which are being conducted in cooperation with other State agencies and private institutions.

A prominent example of this is the "Teleschools" project that was launched in 1985 with the participation of the State Department of Commerce and Consumer Affairs and will give remote schools the ability to receive live broadcasts in classrooms and interact with them via audio and computer links. By partially removing the constraints of geography, projects of this nature can improve both the quality and diversity of educational experiences. For example, the Hawaii public school system currently employs just two teachers of Mandarin Chinese and one Russian instructor; distance learning programs would permit schools across the state to offer these languages to interested students who might not otherwise have the opportunity.

Other projects under the DLT umbrella are intended to explore the use of telecommunications to promote additional educational goals. "Career Kokua" will receive funding to experiment with the use of personal computers and cellular phones in portable career centers in order to increase students' awareness and utilization of high technology and their potential career options in the field. "Hawaiikids" plans to connect to a national database geared to the needs of special education students, which will provide resources that may not be available elsewhere in the state. Finally, plans to introduce voice mail and computer networking into school administrations have the potential to lower their operating costs and improve the dialog between administrators, teachers, and parents.

Local government initiatives: The City and County of Honolulu has recently acquired a new "E-911" system for emergency calls. This system relies on a new software function of Hawaiian Telephone's digital switches known as Automatic Number Identification (ANI) that forwards the telephone number of the dialing party to the recipient of the call. This capability could prove invaluable to emergency and rescue workers by allowing them to identify the geographic origination of an emergency call and expedite a response team. In fact, Mayor Fasi has already credited it with saving one life in a medical emergency case. This represents a dramatic example of how improvements in telecommunications can create an opportunity for government agencies and other public institutions to provide services more efficiently and effectively.

The city's Department of Data Systems has been increasingly active in upgrading the quality and interconnectivity of its information resources. The agency established city-wide standards for its data processing facilities in 1985. Since that time, the number of terminals linked to its main computing facilities has grown from 200 to over 800, and the use of personal computers is becoming more prevalent. An important part of this development has been the installation of terminals in all eight of the "satellite city halls" that are located in neighborhoods throughout the city. The availability of reliable voice and data links to these locations plays a key role in the success of the experiment in decentralizing the administrative functions of municipal government. The city plans to extend this concept to include three "mobile" city halls, which would underscore the conclusion that demand for advanced telecommunications services tends to increase the more their potential is explored and realized.

Federal initiatives: The U.S. armed forces have a major impact in the telecommunications sector in Hawaii. In December 1985, Hawaiian Telephone won a $112 million, ten-year contract to build a comprehensive new telephone system for the armed forces based on Oahu. The Oahu Telephone System (OTS) is now in its third and final phase of construction. By September 1 of this year, 35,800 OTS telephones had been installed, while the anticipated growth of the system was revised to substantially exceed the 30% growth rate estimated in the original Request for

Proposals. In addition to meeting the armed force's burgeoning needs for system capacity, OTS will provide many improvements directly related to the utilization of new telecommunications technology. Some of these are particular to the requirements of military operations, such as a very high level of survivability and reliability through the use of alternate routing and dual homing techniques. However, other improvements reflect the escalating telecommunications needs of any modern public institution in the state, including high-quality digital switching and transmission of data, expanded voice calling features such as conference calling, call waiting, and call forwarding, and greater customer control and accounting for the system as a whole.

NASA has proposed to develop a Space Information Center at Ka Lae (South Point) on the Big Island. The Center would be intended to serve as a central station for downloading and processing data transmitted from the earth monitoring satellites operated by NASA, the National Oceanic and Atmospheric Administration, and other scientific agencies. In addition to the site's geographic and climatic suitability for receiving satellite transmissions, the proposed Center would also be located near the other Big Island research facilities and could be expected to contribute substantially to the demand for advanced telecommunications on the Hilo side of the island.

University of Hawaii: The University of Hawaii is actively engaged in numerous telecommunications projects both on its main campus in Manoa and on satellite campuses on Oahu and the other islands. The University has historically been a leader in the development and use of advanced telecommunications technology in the State. Telecommunications has generally not been pursued as an end in itself, such as focusing on direct research and development in telecommunications engineering. Instead, the interest has been driven by the University's role as a center of education, research, and innovation, areas in which the ready availability and dissemination of information is essential.

The University's telecommunications initiatives fall into several broad categories. There are projects designed to modernize the institution's basic communications infrastructure, such as the new telephone system for the Manoa campus. Other efforts are intended to satisfy the specialized communications needs of advanced research, such as acquiring high-speed digital "T-1" lines for the University's Institute of Astronomy facilities on Maui and the Big Island. Third, the University sponsors a variety of projects designed to both expand the range of its educational resources (such as links to the computer networks operated by other universities on the Mainland), and to make its resources available to a wider spectrum of the State's citizens. Finally, through participation in State initiatives such as the development of the public enhanced services gateway envisioned with the passage of Act 1, 1988 Special Session, the University hopes to encourage the diffusion of information and innovation throughout Hawaii's economic and social sectors.

The University's largest ongoing telecommunications project is the installation of a new campus telecommunications system at Manoa. Bids were gathered during the first part of 1988 from Hawaiian Telephone (which provides the current system out of its "Selex" Centrex tariff) and several PBX vendors, including AT&T, NEC, and IBM/Rolm. The ten-year, approximately $25 million contract was awarded to Hawaiian Telephone in July 1988, and the resulting project is expected to represent a major step forward for the campus communications infrastructure. The new system will include a new digital switch located on campus designed to serve up to 7600 lines and 824 trunks. In addition to furnishing numerous custom calling features, the switch will incorporate

a Telecommunications Management System which would allow the University to analyze its traffic patterns, monitoring service quality, and provide its own directory services. The contract also calls for the system to offer digital data transmission capability to every telephone location served. The university's existing optical fiber and coaxial cable networks used for computer networking and video transmission will also be expanded to serve additional buildings. The system is scheduled for completion and "cutover" in June of 1989.

By virtue of its continual requirements for state of the art telecommunications, the University has frequently been the first institution in the state to make use of new service capabilities of Hawaiian Telephone. For example, the University was among the first customers to request and obtain high capacity "T-1" digital circuits. In fact, the University's role has sometimes been to "pull" Hawaiian Telephone into the provision of an advanced service before the telephone company was prepared to tariff a generally available service offering. Perhaps because of this pioneering role, the University has had some frustrating experiences with the provision of advanced services by Hawaiian Telephone. Problems cited by University staff include company resistance to and slow delivery of new services, occasionally unreliable service, and a lack of communication between end users of the University and service personnel of the telephone company.

Maui Community College, which benefits from the University's centralized projects, has added several additional systems designed to meet its unique requirements to serve students on three islands. The College began planning for a five phase project in 1981 and has succeeded in bringing many new systems into operation since then. The systems already operational include both on campus and off campus cable TV channels, the Maui Community College Skybridge, which is a two-way teleconferencing network that links the Wailuku campus to Lanai and Molokai, and satellite downlinks that permit programming from outside of Hawaii to be broadcast on the campus. Future plans call for installation of satellite uplinks that will permit Maui Community College to initiate programming for others, and links between the satellite facilities and the cable TV and Skybridge facilities. In addition to the instructional and programming facilities, Maui Community College uses telecommunications facilities for transmission of data within the campus, to its community outreach facilities, and to and from other University systems and out-of-state facilities.

The educational and teleconferencing facilities that the University of Hawaii plans will benefit the research and development community as well. For example, scientific staff on the neighbor islands miss the opportunity for continuing education since there are no advanced scientific and engineering courses available in the community colleges. However, HITS (the Hawaii Instructional Television System), Skybridge, and satellite facilities have the potential for bringing these courses from distant locations providing a substantial benefit to the community.

Chapter 4

Telephone Regulation in Hawaii

Jurisdiction of the Hawaii Public Utilities Commission

This section will outline Hawaii law relevant to the regulation by the Hawaii Public Utilities Commission of telecommunications services such as bypass, common premises communications systems or shared tenant services, customer owned coin operated telephone systems, alternative operator services, and competitive alternatives to interisland service. The discussion will include an analysis of Chapter 269, Hawaii Revised Statutes, and the Hawaii Supreme Court's seminal decision in the *Windpower* case. The section will conclude with a brief review of the options available to the legislature should it wish to increase the Commission's flexibility and discretion, or to curtail the Commission's authority, to regulate "telecommunications activities" as a "public utility" as those terms are defined by the present statute.

Chapter 269, Hawaii Revised Statutes, mandates the regulation of every public utility. Chapter 269, Hawaii Revised Statutes, vests the Commission with broad authority to regulate Hawaii's public utilities. The scope of this authority is expansive, and runs the gamut from the necessity for the service to the terms pursuant to which it may be provided. The question, therefore, is whether activities such as bypass, shared tenant services, pay telephones, alternative operator services, and alternatives to interisland service fall within the statutory definition of "public utility."

It should be pointed out initially that the dockets filed with the Commission thus far have focused on shared tenant services and pay telephones. The related issues of bypass, alternative operator services, and alternatives to interisland service which are discussed at length in following sections of this report have not yet generated controversy in Hawaii as have shared tenant services and pay telephones, and have not been the subject of direct inquiry by the Commission. The analysis of the present jurisdictional scheme in Hawaii is the same for these related services as it is for shared tenant services and pay telephones.

Section 269-1, Hawaii Revised Statutes, defines a public utility as any person who may own, control, or operate equipment for the transmission of intelligence by electricity within the state. A careful parsing of the text of the provision reveals a three-pronged test: (1) ownership and control of any plant or equipment; (2) which is dedicated directly or indirectly for public use; (3) for the conveyance of or transmission of telephone or telegraph messages, or the transmission of intelligence by electricity.

In view of the generality of the provision, the decision of the Commission to exercise jurisdiction over shared tenant services and pay telephones comes as no surprise. The Commission's position is not without opposition, however. Those wishing to offer shared tenant services or to install privately owned pay telephones argue they are not a "public utility" either because their service is limited to a discrete group and not to the public, or because they are merely "resellers" of the service.

In Docket No. 5660, In the Matter of Hawaiian Telephone company Instituting an Investigation of Regulation of Telephone Shared Tenant Services, the parties by stipulation created a new name for a telecommunications system used to furnish shared tenant services, Common Premises Communications System (CPCS) and defined CPCS as a telecommunications system that offers to occupants of common premises use of private telecommunications switching equipment and services connected to the public switched telephone network. In addition, they agreed that the components comprising the system must be subject to the legal control of the same individual, partnership, or corporation, who shall also be affiliated with the owner, lessor, or renter of the common premises either by common ownership or by contract. (Docket No. 5660, Order No. 9024.) Lastly, the parties and the Commission agreed that premises occupied by a single entity or individual, as well as single family detached dwellings were not within the definition of CPCS. Using this definition, under existing statutes CPCS providers will be subject to regulation if they own, lease, rent or control the plant and equipment for the transmission of telephone messages to the public. Similarly, providers of customer owned coin operated telephones (COCOTS) will be subject to regulation under existing statutes if the facility for the transmission of telephone messages (the telephone itself), as the name connotes, is "customer owned." Although the parties have agreed on a definition of CPCS, they disagree on the application of the *Windpower* test to the definition.

Before examining the test, it is significant to note that Hawaiian Telephone's current tariff addresses the subject of resale of its service. The tariff provision prohibits the resale of any service furnished by Hawaiian Telephone or the resale of the use of any facility furnished by Hawaiian Telephone. See (Hawaiian Telephone Company P.U.C. Tariff No. 1, Section 2, subsection 27.) However, the tariff contains one important exception to this prohibition. Hawaiian Telephone customers who are in the business of furnishing temporary lodging, where the provision of telephone service is ancillary to the provision of temporary lodging, and where it is impractical for Hawaiian Telephone to directly bill the end user of the telephone service, "may pass along the cost of providing service to the occupants of the temporary lodging." *(Id.)* Essentially, the tariff allows the use of a common telephone system to provide local service without subjecting those systems to regulation if the system is used by those in the business of temporary lodging. Clearly, it would not be practical for Hawaiian Telephone to bill the transient user, such as a hotel guest, for the use of local telephone service. The Commission presently has before it Docket No. 6232, *In the Matter of Hawaiian Properties, Ltd.*, in which the Commission will consider whether a provider of temporary lodging in condominiums is a reseller of Hawaiian Telephone service, and whether the service furnished should be offered under tariff or falls within the exemption described above.

***Windpower* and the Public Use Test.** Application of the "public use" element of the test set out in *Windpower* has been the focus of discussion. On September 19, 1986, the Commission initiated Docket No. 5660 to investigate (1) whether or not shared tenant services should be allowed; (2) if shared tenant services are allowed, whether or not the activity should be regulated; and, (3) what rules, regulations, and rates should be established to best serve the consumers of these services. The Commission ordered the Consumer Advocate and the Hawaiian Telephone Company to participate. The Commission also allowed Outrigger Hotels Hawaii (Outrigger), Kakaako Venture Limited (Kakaako), and Wang Information Services, Inc. (Wang) to participate as intervening parties to the investigation. The intervening parties took the position that shared tenant service was not subject to regulation because it would not be offered to the public.

The Consumer Advocate and Hawaiian Telephone countered that intervenors were reading the word "public" too literally, and that intervenors intended to offer their services not to one consumer but to a large segment of the public. They cite as an example the occupants of a given building or project, who would utilize a common switch network for their telecommunication needs. The Consumer Advocate and Hawaiian Telephone maintain that this is the "public" meant by the Hawaii Supreme Court in its decision in *In re Windpower Pacific Investors--III* (67 Hawaii 342 (1984)).

Windpower Pacific was engaged in the production and sale of electricity to Waikoloa Water Company Inc. Waikiloa Water Company contracted to sell excess power to Hawaii Electric Light Company. Waikoloa Water Company had no other customers for its surplus electricity. Under these facts, the Commission found that Windpower's wind mills would *not* be dedicated to public use and that the company was not, therefore, a public utility. (67 Hawaii at 346.)

In upholding the Commission's determination, the Supreme Court reiterated the common law definition of a "public utility:"

> Whether the operator of a given business or enterprise is a public utility depends on whether or not the service rendered by it is of a public character and of public consequence and concern, which is a question necessarily dependent upon the facts of a particular case, and the owner or person in control of property becomes a public utility only when and to the extent that his business and property are devoted to a public use. The test is, therefore, whether or not such person holds himself out, expressly or impliedly, as engaged in the business of supplying his product or service to the public, as a class, or to any limited portion of it, as contra-distinguished from holding himself out as serving or ready to serve only particular individuals. (67 Hawaii at 345.)

The Commission subsequently applied the *Windpower* test in *In the Matter of the Application of Tel-Net Joint Venture, dba Tel-Net Hawaii* (Docket No. 5121 (February 1986)). Tel-Net sought to provide microwave communications service between points in the state of Hawaii. In deciding that Tel-Net was not a public utility, the Commission stated:

> A public utility implies public use and the owner must dedicate his business and property to public use for it to become a public utility.

The Commission found that Tel-Net intended to provide service solely for the private use of Honolulu Federal Savings & Loan Association (HonFed). The Tel-Net facilities were not "dedicated" to public use because they served only one consumer, HonFed. However, the Commission emphasized that should Tel-Net offer the service to others, it would be required to seek a certification as a public utility. Tel-Net later did so.

Before the Commission could decide the jurisdictional issue, Outrigger moved to defer proceedings until the telecommunications investigation requested by the Legislature under Act 331, Sessions Laws of Hawaii 1988, was completed. With the agreement of the other parties, the Commission agreed to continue the investigation.

The logic of *Windpower* is borne out by the Commission's initial finding that shared tenant service providers are public utilities subject to its jurisdiction because of the public nature of the beneficiaries of the service. The same conclusion was reached with respect to privately owned pay telephones. The pay telephones would be available for use by anyone; at the very least, by the occupants or visitors to a private building. Regardless of who owned the pay telephones, the service would be offered to "the public, as a class, or any limited portion of it." *(Windpower, supra.)*

Other jurisdictions having public use requirements similar to Hawaii have responded to the issue of shared tenant services with a wide range of solutions. Some states have determined that shared tenant service providers are not public utilities, while others have determined that they are. Some states have prohibited sharing of telephone systems by unrelated firms altogether while other states permit the services subject to no regulatory constraints, or subject to varying degrees of regulation. Still other states take the position that shared tenant services may be offered on an unregulated basis provided the end users have the option of subscribing to local telephone company service. This degree of competition is viewed as enough to impose self-regulation on the shared tenant service provider.

At least one jurisdiction, Utah, opted for regulation based on the reasoning of *Windpower*. The Utah Public Utilities Commission used the *Windpower* test to determine whether a shared tenant service provider was a public utility. In *Re Local Exchange Service Resellers* (62 PUR. 4th. 652, 656 (1984)) the Utah Commission stated:

> We do not understand the cases to mean that the offered service must be available by subscription to the entire universe of Utah's citizenry before rising to the jurisdictional level of 'service to the public generally'.

Although the Utah PUC determined that its statutory scheme mandated that shared tenant services be regulated, the legislature later exempted these services from regulation.

As in the case of the common ownership requirement, there is no dispute that the technologies involved in shared tenant services and pay telephones are subject to regulation. Section 269-1, Hawaii Revised Statutes, specifically includes within the jurisdiction of the Commission every technology that conveys or transmits intelligence by electricity. The shared tenant service provider (whom the Hawaii PUC called a CPCS provider) will control the common switch through which all telecommunications of the common premises will flow. To reach the public telephone network, all occupants will be required to use the CPCS network. This involvement with the public telephone network clearly falls within the ambit of Section 269-1, Hawaii Revised Statutes.

The Commission must regulate all public utilities. Once an activity is determined to be a public utility, Chapter 269, Hawaii Revised Statutes, mandates Commission regulation of that activity. Section 269-6, Hawaii Revised Statutes, for example, declares:

> The Commission *shall* have the general supervision hereinafter set forth over *all* public utilities, and *shall* perform the duties and exercise the powers imposed or conferred upon by this chapter. (Emphasis added)

Likewise in respect to regulation of rates, Section 269-16, Hawaii Revised Statutes, mandates that "all rates, fares, charges, classifications, schedules, rules and practices...*shall* be just and reasonable and *shall* be filed with the public utilities commission." (Emphasis added).

The plain language of the statute allows no argument that the Commission has discretion to decline to regulate a given public utility. The use of the word "shall" indicates that the legislature intended that the Commission carry out the mandates of Chapter 269, Hawaii Revised Statutes, without equivocation. *In re Fasi* (63 Hawaii 624 (1981)). Once shared tenant services or pay telephone services are determined to be public utilities, the present statutes dictate that the Public Utilities Commission shall regulate those services and their ratemaking procedures.

The form of the regulation will entail issuance of a certificate of public convenience and necessity (CPCN) pursuant to Section 269-7.5, Hawaii Revised Statutes. Before commencing services, any person who holds himself out to the general public as a public utility must first obtain a CPCN from the Commission subject to the criteria set out in this section. The section includes the following criteria:

> (b) A certificate shall be issued to any qualified applicant therefor, authorizing the whole or any part of the operations covered by the application, if it is found that the applicant is fit, willing, and able properly to perform the service proposed and to conform to the terms, conditions, rules and regulations promulgated by the commission thereunder, and that the proposed service is, or will be, required by the present or future public convenience and necessity; otherwise such application shall be denied...

There is no current legal basis on which a telephone service, meeting the definition of a public utility, may claim exemption from substantial regulation. Any exemption from jurisdiction or regulation should be authorized by legislation. This could be done by exempting specific types of telephone service from public utilities jurisdiction (as was done for various types of non-fossil fuel electric producers exempted by Section 260-1(7), Hawaii Revised Statutes.) Given the fast changing nature of telecommunications, probably a better approach would be to adopt legislation granting the Public Utility Commission discretion to determine, in the public interest, whether it will regulate, and to what extent it will regulate, telecommunications activities within its jurisdiction.

Conclusion. Shared tenant services and pay telephones are public utilities under current statutory and case law in Hawaii. The same jurisdictional analysis is applicable to the related issues of bypass, alternative operator services, and competitive interisland service. As such, Hawaii Revised Statutes mandate that the Commission exercise its regulatory control over these services. Assuming that the State Legislature determines that any of these services should be available in Hawaii, then the alternatives available to the Legislature with respect to regulation of these services include:

(1) allowing the Commission complete regulatory control over these services, and affirmatively requiring the Commission to regulate rates and tariff conditions, which is the situation under present Hawaii law;

(2) exempting these services from any regulation;

(3) exempting these services from any regulation but providing that the end user must have the option to choose between the provider of these services and direct Hawaiian Telephone service; or

(4) allowing a regulatory body, such as the Commission, flexibility and discretion in setting regulations and/or tariff requirements for these services where to do so would be in the best interests of the public.

The State Legislature must determine what degree of regulation, if any, of these telecommunications services will best serve the interests of the people of Hawaii, and the role that the Public Utilities Commission will take in serving those interests. In making this determination, the legislature should consider the flexibility that the Public Utilities Commission will need to meet the challenges presented by a complex and rapidly changing telecommunications field; and, the Commission should evaluate its approach to regulation to insure that it is responsive to the needs of the public.

Current Rate Structure

The current rate structure for Hawaiian Telephone Company is an important consideration in the formation of policy for Hawaii Telephone's regulated telecommunications services. It is a key factor both in providing motivation for customers to seek out alternatives to Hawaiian's regulated services and in establishing the viability of those alternatives. This section will provide a concise overview of the relevant services discussed in this report. (A summary of Hawaiian Telephone's rates is included in Appendix A to this report.) In addition, the public policy that has influenced the rate structure and the implications of that policy vis a vis restructuring of rates will be discussed.

Local telephone service is currently provided exclusively on a flat rate basis in the state of Hawaii, and rates are structured according to the traditional demarcation between business and residential rates. The rates vary from island to island based generally upon the size of the population (although the rates do not vary in direct proportion to population). Thus, rates for service on Oahu are the highest, while those on Lanai are the lowest. The rates for individual line *business* service range from $35 per month on Oahu to $17 per month on Lanai. Monthly rates for individual line *residence* service span a range of approximately $10 to $14 on the islands. *PBX trunk* service rates range from $54 per month on Oahu to just over $20 per month on Lanai. By way of comparison, on the mainland, individual line residence service rates average $10 per month. However, because each island has been established as a single local calling area, Hawaii has larger *geographic* local calling areas than those found on the mainland.

Local measured service, which has been proposed by Hawaiian Telephone, has been implemented in a number of states as an alternative to traditional flat rate local telephone service. Under measured service plans the customer is charged for every call. Some plans are based on both time and distance, others have some message unit-type structure which may involve calling bands and may or may not time the calls. Measured service has been promoted as a more efficient scheme for pricing of local service -- since those who make more calls pay more for their service. However,

one of the chief proponents of measured service has recently concluded that the economic gains possible from measured service pricing are, at best, marginal, because the costs of measuring and billing for calls raise the total cost of furnishing local service.[1]

Local measured service is offered to both residential and business customers in various forms on the mainland. A recent survey of 23 states found *residential* local measured service offerings in 17 states and *business* local measured service offerings in 19 states. In 13 of these 19 states, measured service is, and has been, an *option* for businesses in traditional regulatory policy. Business local measured service is pending in two states studied and is *mandatory* in three other states. Businesses are more likely to be subject to mandatory measured service. Flat rate unlimited local service remains the traditional standard residential telephone option offered for local telephone service.

Public policy considerations have been most influential in pricing of local telephone service, particularly for residential customers. There has long been a policy goal of achieving "universal telephone service," not just in Hawaii, but in the U.S. generally. Simply put, the policy goal is to have all residents of the United States on the national telephone network, that is, to have telephone service in their homes. To achieve this goal, regulators have supported pricing policies that subsidized residential telephone rates. Rates for local telephone service were typically set below the cost incurred by the local telephone company in furnishing the service. The subsidy was recovered from other services that were priced above cost.

Much, although not all, of the subsidy to local service has typically been recovered from long distance services. For a long time, perhaps since the early 1950s, it was easy to maintain this pricing policy because technology was dramatically reducing the cost of long distance telephone calls. Rather than ordering reduced rates for long distance calls, the regulatory authorities - both federal and state - simply left the long distance rates high and passed the subsidy on to local telephone rates. That is the basic rate structure that remains in place in Hawaii today. Rates for residential local telephone service are priced below the cost to Hawaiian Telephone of furnishing that service, while long distance service between islands is priced well above cost.

Long distance service is called "Message Telecommunications Service" by Hawaiian Telephone. All long distance calls in Hawaii are between islands, and it appears that all calls go through Oahu even if the neither the caller nor the called party is on Oahu. Hawaiian Telephone charges the same rate per minute (first/additional) for all calls regardless of the origination and destination of call. As discussed below, these factors have various implications for allowing competitive entry into this market.

There are three categories of long distance service: dial station-to-station (where the caller dials the number), operator station-to-station (where the operator assists, as with a collect or credit card call), and person-to-person. Regular dial station-to-station service has an initial period of one minute for which there is a $0.42 charge. Both operator station-to-station and person-to-person calls have an initial period of three minutes with corresponding charges of $2.00 and $3.05 respectively. The charge for each additional minute beyond the initial period, for all categories, is $0.29. There are time-of-day discounts of 35% for the evening period and 60% for the night/weekend period for some charges. These discounts are closely aligned with mainland discounts.

Hawaiian Telephone also offers business customers a discount long distance service called Wide Area Telecommunications Service (WATS). Unlike customers in the mainland states, many customers in Hawaii have found that WATS is not a cheaper alternative to regular long distance charges. The business customer must pay for a minimum of 10 hours of use at $168.00 per month. The additional period provides for the use of this service beyond the initial period on a per hour basis with charges ranging from $13.55 for the first 30 hours beyond the initial period to a charge of $2.45 for each additional hour beyond a total of 200 hours. The rates for 800 Service (or Inward WATS) in Hawaii follow the traditional rate structure found in the mainland states. The rates are comprised of a monthly access line charge of $32.10 and monthly usage charges per access line ranging from $12.00 per hour for the first 30 hours to $3.30 per hour for each additional hour beyond 220 hours.

These rates for long distance service are high from a number of perspectives. First, as many in Hawaii are aware, the rates are higher than those for long distance service to some parts of the mainland. It is cheaper to call Los Angeles from Honolulu than it is to call from Honolulu to Lihue. The rates are also high in comparison with the cost to Hawaiian Telephone of furnishing the service. This is because of the universal service policy discussed above. According to data obtained from Hawaiian Telephone's most recent general rate proceeding (Hawaii Public Utilities Commission Docket No. 5114), the amount of the subsidy to residential service is some $50-million annually.[2] This is equivalent to approximately $12 to $13 per month per residential customer. It is long distance service that provides much of this subsidy.

In summary, Hawaii's rate structure combines relatively low flat rate residential service and moderately priced, flat rate business service within each island with high, measured charges for calls between islands. The islands include geographically larger local calling areas than are found on the mainland. To the extent that business is communications intensive, the rate structure encourages doing business within a single island and discourages interisland business. In addition, flat rate, as compared with measured rate, local telephone service has an impact on views as to whether or not shared tenant services should be allowed. Since one of the effects of sharing local telephone service among several unrelated businesses is to concentrate local calls over fewer lines, there is some suggestion that the local telephone company would lose revenue unless shared tenant service installations were required to pay for local service on a measured basis. As discussed further in Chapter VI, the impact of shared systems on the local telephone company's costs and revenues is more complex than this simple view would suggest. Thus, it is not evident that a change in the rate structure for local service is either necessary or desirable prior to approval of the concept of shared tenant services.

Notes

1. Rolla Edward Park and Bridger M. Mitchell, *Optimal Peak-Load Pricing for Local Telephone Calls*, The Rand Corporation, Publication Number R-3404-1-RC, March 1987.

2. *See*, Hawaii Public Utilities Commission Docket 5114, Exhibits Hawaiian Telephone-1200 and Hawaiian Telephone-1219(S). Based on the same data, it appears that, on average, business local telephone service is not subsidized. Rates for this service on Oahu substantially exceed cost, and business local telephone service contributes some $8- to $9-million annually to other services.

Chapter 5

Bypass

"Bypass" occurs when a customer decides to use an alternative to the local telephone company's basic services to complete local calls or to connect to a long distance company. The alternative may be provided by a competing supplier, or (as in many cases) it may be a dedicated line leased from the local telephone company itself. Bypass has not proven to be a significant problem and most telephone companies have experienced strong growth in demand for network services over the past several years. Under existing Hawaii law, the Public Utilities Commission must regulate any company that intends to offer bypass services to the public. The Legislature might consider granting the Commission greater discretion in its regulation of bypass services providers. The Legislature might also direct the Commission to keep it informed on future bypass developments to insure that bypass will continue to have a minimal effect on Hawaiian Telephone and the state's ratepayers.

Issue Summary

The issue of bypass has been a source of controversy in the industry almost since the term was introduced by the Federal Communications Commission in 1982. This is partly because the definition of what constitutes bypass activity varies widely among industry participants with different interests. In the broadest sense, the term "bypass" refers to the use of *any* telecommunications facility or service that substitutes for the basic switched telephone services provided by the local telephone company. Under this definition, new types of service arrangements such as mobile cellular telephone services ("carphones", etc.) and Common Premises Communication Systems (otherwise known as Shared Tenant Services arrangements) are considered to be competing with traditional local telephone services in a single, broadly conceived local exchange services market.

Other observers may see the development of these service alternatives as instances of the emergence of new and distinct markets, but still consider other forms of substitution for local services as manifestations of bypass. For example, bypass investigations conducted on the federal level have been primarily concerned with alternatives to the *switched access* arrangements normally required for the completion of long distance communications. In any event, the principal issue raised by bypass in any form is the potential impact it may have on the rates and revenues of the franchised local telephone company, and by extension on the welfare of the general body of ratepayers, including residential subscribers. The concern is that if large numbers of customers elect to bypass and thus reduce their payments to the local telephone company, a revenue shortfall could be created that would have to be recovered by imposing higher rates on the remaining base of telephone subscribers. Moreover, the potential problem is often characterized as a continuing spiral: as more customers leave the public network, those that remain are subject to rate increases that then increase the incentives for more bypass, ultimately threatening the long-standing public policy goal of affordable, universal access to telephone service.

Later in this Report, detailed consideration will be given to three specific categories of emerging local service alternatives, namely shared telephone services ("Common Premises Communications Systems"), private payphones ("Customer Owned Coin Operated Telephones"), and competitive operator services ("Alternative Operator Services"). This section will focus on the most prevalent form of existing and potential bypass activity, the use of alternatives to traditional switched access arrangements. It must be noted at the outset that many of the investigations of bypass and the resulting policies adopted in other jurisdictions have limited applicability to Hawaiian policy-making. Earlier this year, Hawaiian Telephone reported to the Federal Communications Commission that it has experienced very low levels of access-related bypass, with virtually no non-company supplied bypass substitutes being employed for calling to the mainland U.S. Secondly, with the virtual lack of in-state competition (with one important exception, Tel-Net's interisland high-speed data service), the Public Utilities Commission has not to date established a system of intrastate access charges, which is frequently central to the bypass inquiries undertaken in other jurisdictions.

Nevertheless, there are two related topics in the bypass controversy that merit close attention by policymakers in Hawaii. Since bypass remains largely a potential problem for the State, the first topic is the incentives to bypass that can arise for subscribers, particularly for the class of large business and institutional customers that comprise the overwhelming majority of existing bypassers in other jurisdictions. This leads directly to the second topic, which is how Hawaiian Telephone's present rate structure and provisioning of service could be changed in order to minimize the future potential for a bypass problem in the state.

Approaches Elsewhere

Background. The possibility of bypassing traditional switched telephone service is generally contemplated only by large, sophisticated users of telecommunications services, such as banks and other financial institutions, hotels, etc. For example, a hotel with high volumes of outbound long-distance calling might consider obtaining a *dedicated* telephone line that would provide a direct connection to the switch of a long-distance carrier (such as AT&T or MCI). In this arrangement, the hotel can originate interstate calls without using (or paying for) any portion of their local telephone company's switched network. In this service arrangement, the public switched network continues to be used for both the long distance portion of the call and its eventual termination at the called party's location. The bypass occurs only at the point of the originating connection to the long-distance company, where part or all of the facilities normally obtained from the local telephone company are avoided.

Those cases in which a dedicated telephone line is furnished by an alternative supplier or the customer itself are known as *facilities bypass*. This arrangement is shown in Figure 5.1.

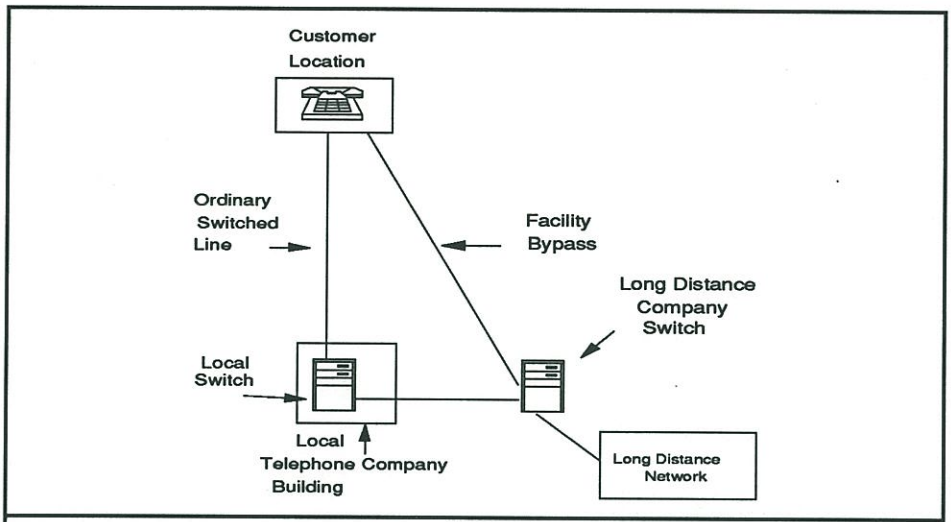


Figure 5.1 - Facilities Bypass

In the great majority of cases, the customer must lease the dedicated access line from the local telephone company *itself,* there being few, if any, economic alternatives.

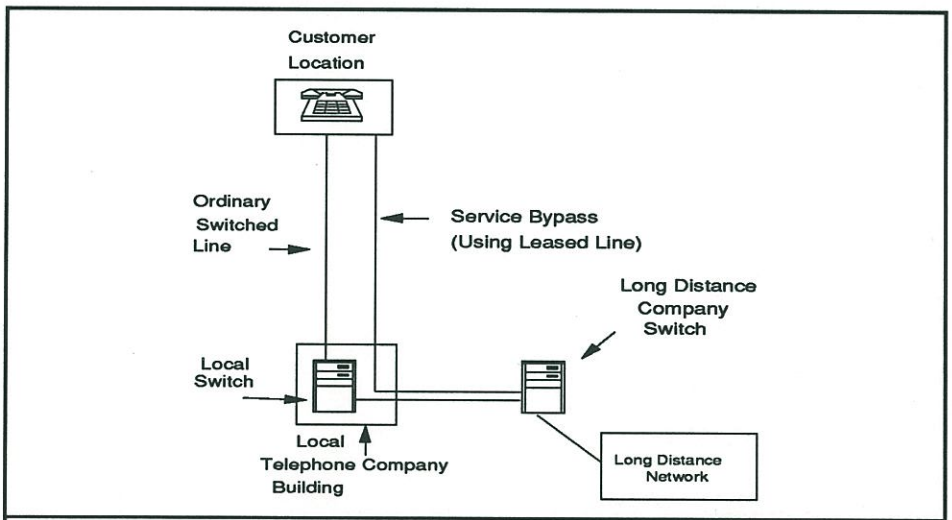


Figure 5.2 - Service Bypass

This situation is known as *service bypass*, since the customer is simply replacing one local company service (ordinary local telephone lines) with another (the dedicated line). It is considered an instance of bypass because a dedicated line may make little or no use of the company's existing lines and switches, as illustrated in Figure 5.2.

The least frequent and more extreme form of bypass is *end-to-end bypass*. This occurs when a large business or institution owns or maintains a telephone network for its private use, that may carry traffic entirely independently of the public switched networks of both the local and long distance companies. This is shown in Figure 5.3.

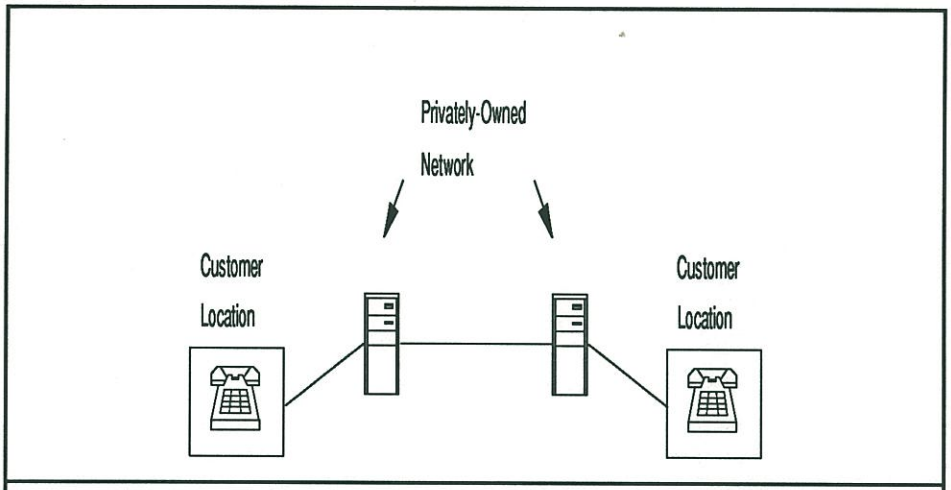


Figure 5.3 - End-to-End Bypass

The use of alternatives to local telephone services has occurred to some extent for many years, but only with the dismantling of the Bell System in 1984 did this activity receive attention as a policy issue. This occurred partly because changes in regulatory policy and the structure of the industry, in particular the establishment of access charges, created greater *structural* opportunities for bypass. Second, the resulting proliferation of alternative technologies such as microwave transmission, improved satellite systems, and optical fiber generated more *technically* feasible bypass options. And third, the combination of these factors resulted in a limited number of bypass options becoming more *economically* attractive.

Access charges. The AT & T divestiture's separation of the functions of the local telephone company and the long distance provider led to the creation of a system of *access charges,* first on the federal level and later, where in-state long distance competition has been permitted, on the state level. These charges are ordinarily paid by a long distance company to local telephone companies to compensate for the use of their local telephone lines and switches - called "access facilities" - in originating or terminating long distance traffic. In addition to recovering the costs directly associated with usage of the local switched network, these charges generally include a rate element (such as the FCC-mandated Common Carrier Line Charge for interstate access) intended to recover a portion of the fixed or *non-traffic sensitive* costs associated with the creation and maintenance of the local network.

Technological Options. Innovation during the past decade or more has resulted in a range of technological options for potential bypassers. Although these options are often referred to generically as "bypass technologies", it should be borne in mind that most of these technologies were originally developed by the telephone companies themselves, with microwave and fiber optic technologies in particular having become an integral part of modern telephone networks. The new technologies that are capable of being used in bypass applications include the following:

- Microwave - uses high-frequency radio waves to transmit voice or data traffic between receivers ordinarily located no more than 20 miles apart. Generally low cost and relatively unsophisticated, but with limited range and capacity. One of the earliest and most widely used technologies for bypass.

- Fiber optic cable - the latest, state-of-the-art technology; uses tiny strands of glass fiber to transmit voice or data traffic over light signals. Generally used in a digital format, which is effectively error-free. Currently being widely deployed by regulated telephone companies to take advantage of its extremely high carrying capacity.

- Coaxial cable - an older technology similar to the copper wire traditionally used by telephone companies but with a higher capacity. Coaxial cable is used by telephone companies for some purposes, including some of the undersea cables linking Hawaii and the mainland U.S. However, this technology has been most widely used by cable television companies, which have extensive coaxial networks. While these networks could be used for some bypass applications, it would usually require additional equipment and network design changes that have so far deterred their use for bypass.

- Satellite - for bypass applications, normally requires fixed or semi-portable dishes (1-3 meters in diameter) at the customer's location, which beam radio signals up to a relay satellite. Generally more suited for longer distance uses or communication between many widely scattered points.

- Several "exotic" options - these include infrared laser beams and a radio broadcast technique called FM radio sideband, techniques that are now possible but mainly suited to specialized, infrequent conditions.

While potential bypassers may be able to choose from among these options, the performance of each will vary for different applications. For example, microwave systems are best for short-range, line-of-sight purposes, since transmission over longer distances ordinarily requires expensive amplification and "repeater" equipment. Optical fiber is best for sophisticated users who require reliable, high-speed data transmission and or other advanced services, both because of the medium's enormous capacity and since it currently requires considerable skill and experience to install. In practice, therefore, a business or institution considering whether to bypass usually has fewer options than would be suggested by simply listing the available technologies, even before factors such as their relative costs are taken into account.

Economic Factors. The greatest economic factor impacting on bypass decisions has been how state and federal policymakers have allocated the fixed, non-traffic sensitive costs mentioned above. Since the local network is shared by (and indispensable to) both local service and access services, in economic terms there is no "correct" allocation of these *joint costs* between the local service and access service categories. Both the method and the size of the share of fixed costs charged to access service can loom large to potential bypassers, since access rates that are set significantly above the direct costs of access may make alternative access arrangements look economically attractive.

With the imposition of intrastate access charges, many state regulatory commissions created a usage-sensitive charge to recover fixed costs. These charges penalize high-volume users with an overrecovery of fixed costs, and thus create an artificial incentive to bypass. The FCC and several states have attempted to minimize this incentive by adopting flat-rate access charges paid directly by end users. Some other states have adopted capacity-based fees paid by long distance carriers to access providers, while still others, notably Illinois, have experimented with alternative access tariff structures.

Federal bypass policies. The issue of bypass and concerns over the negative impact widespread bypass could have on the local rates of telephone carriers has received the most attention on the federal level. Rather than being considered in isolation, however, bypass has been primarily addressed in the context of how the fixed costs of the local exchange network should be recovered.

In its 1983 decision to establish the interstate access charge system, the FCC called bypass a "growing phenomenon", although it conceded "uncertainty surrounding the precise size and threat of uneconomic bypass".[1] On balance, the FCC concluded that the deterrence of uneconomic bypass "must be one of the criteria for the design of an access plan."[2] This factor, plus general arguments for the economic efficiency benefits of transferring costs onto the cost-causer, led to the Federal Communications Commission's adoption of an end user charge (the monthly Subscriber Line Charge) for access to interstate service as part of the federal access charge regime.

Since the Subscriber Line Charge was intended to apply to all customers' access lines regardless of their usage of the long distance network, consumer advocates and others objected that the charge would reduce the affordability of basic service and could force marginal subscribers, such as low-income households, the elderly, and struggling businesses, to leave the network. In response to Congressional attempts to ban Subscriber Line Charges for residence and single-line business subscribers, in February 1984 the FCC decided to open an investigation of bypass and defer the introduction of a Subscriber Line Charge for those telephone subscribers.

In its Second Report on Bypass released in December 1984, the FCC expanded its definition to include service bypass. The FCC concluded that bypass continued to present a significant potential threat, but in this report emphasized that "during the next few years, service bypass (i.e., the use of special access lines) will be the most prevalent form"[3] and expressed particular concern over the potential for the direct connection of large users to long distance carriers. This conclusion was then used as one of the main justifications for the introduction of a limited Subscriber Line Charge for single-line subscribers.

In June 1986, the FCC opened another investigation to determine whether the Subscriber Line Charge should be increased further. Despite a resurgence of legislative attempts to freeze the Subscriber Line Charge for single-line subscribers, in April 1987 the FCC adopted a plan to increase the charge by $3.50 over a two-year period. In response to a call for substantiation of the bypass threat from the House Telecommunications Subcommittee, the FCC released its third and most recent report on bypass the following month. That report found that bypass continued to be a significant threat, and concluded that "bypass has still not yet achieved its full potential."[4] Once again, the FCC cited long distance carriers as likely to become major bypassers in the future.

However, the Federal Communications Commission's view of the significance of the bypass phenomenon has not been shared by other prominent policymakers on the national level. In September 1987, the presiding judge of the AT&T Consent Decree concluded that the near-monopoly on local telephone companies held by the Bell telephone companies had remained essentially unchanged since 1984. In that ruling U.S. District Court Judge Harold H. Greene observed, referring to data compiled by the U.S. Department of Justice's expert, Peter Huber, that:

> The lack of any but the most minuscule bypass may also have a bearing upon the Federal Communications Commission's effort...to impose access charges upon the ratepaying public. These efforts have been represented as a necessary measure to halt the menace of growing bypass...The Huber Report demonstrates that the premise for this activity has been largely imaginary.[5]

Furthermore, two successive chairmen of AT&T, Charles L. Brown and James E. Olson, had expressly and publicly rejected a pro-bypass policy, and rebutted FCC statements that AT&T could become a leading bypasser. As recently as August, 1987, Chairman Olson observed:

> ...[A]fter all, we built the network. We believe it is fundamental to the provision of quality service that our customers be connected to the telephone company facilities.[6]

At the same time that the FCC confirmed its access charge and bypass policies, the FCC directed the Bell and GTE telephone companies and other major local telephone companies to submit documentation of the bypass occurring within their service territories. Although the FCC had been collecting carrier data on bypass since 1984, these were the first submissions that were opened up to public comment. As conceded in the June 1988 Monitoring Report where the submissions were first published, the carriers reported disparate and conflicting levels of bypass. Other policymakers and interested parties such as the National Association of State Consumer Advocates criticized the carriers' evidence for bypass activity as methodologically deficient, inconsistent, and generally leading to inflated estimates of the revenue losses attributable to bypass.

State bypass policies. New York was one of the first states to initiate its own investigation of the extent and potential threat of bypass.[7] After reviewing two years of data submissions and testimony on the issue, an Administrative Law Judge issued a recommended order that included the following findings:

> (1) Bypass has existed for years and the telephone companies themselves have been providing bypass services for larger customers.

(2) The use of privately-owned bypass systems is primarily motivated by the users' unique service requirements and not cost considerations.

(3) Bypass has not been undertaken by long distance companies to any significant extent. However, this form of service bypass has the highest potential growth, which could be minimized by restoring cost-based pricing relationships between switched and dedicated access services.

(4) The major impact on local telephone companies has been the loss of potential revenue growth (rather than absolute reductions in income or stranded investment). Local telephone companies could reclaim some of this growth by improving their services and paying closer attention to the needs of their larger customers.

In its final Opinion (No. 85-16), the New York Public Service Commission (NYPSC) placed a heavy emphasis on the possibility of future growth in bypass activity and the threat of increased rates for local ratepayers. However, the Commission agreed with the Judge's determination that both access pricing policies and telephone company responsiveness to customer needs affected the growth of bypass. The NYPSC ordered New York Telephone to reduce the portion of fixed costs that were being recovered through usage-based access charges. Second, New York Telephone was directed to make available certain digital services that are attractive to larger business customers, and to furnish more specialized services on a case by case basis. And third, New York Telephone was ordered to update a set of standards for service quality that had been previously developed under Commission direction. This latter step was intended to increase the company's ability to meet customer demands for advanced service provision, timeliness, maintenance, and attractive pricing.

In addition, the Commission imposed streamlined regulation on the providers of bypass services, requiring an initial certification and the filing of tariffs. Finally, the Commission concluded that moving rates closer to costs would be the best method to deter the spread of uneconomic bypass in the future. Consequently the Commission ordered New York Telephone to lower its switched access rates by spreading the responsibility for fixed cost recovery to all revenue sources instead of switched access services alone.

The North Carolina Public Utilities Commission reviewed the bypass situation in the state in the context of an access charge proceeding (Docket P-100, Sub 65). In April 1988, the Commission found that bypass is a form of competition and symptomatic of an industry with increasing competition. The evidence also suggested that most bypassing is performed on the originating end, with only a small number of customers possessing the capability of engaging in end-to-end bypass. The Commission concluded that uneconomic bypass was primarily motivated by high common carrier line charges. In response, the Commission ordered the local telephone companies to adopt a lower, uniform charge, financed in part by territory-specific access rates.

The California Public Utilities Commission most recently addressed bypass issues in Phase III of a comprehensive proceeding (Cases 83-01-22 et al). In the Final Opinion released in June 1987, the Commission concluded that the record had a "dearth of evidence of the increased bypass threat",[8] and rejected the local telephone company's proposals for a fixed access service charge to

recover fixed costs in favor of existing plans to gradually alter the assignment of fixed costs. The Commission noted that uneconomic bypass was "a real problem which bears our attention"[9], but concluded that nothing in the record indicated that bypass presented an immediate threat to access revenues and ratepayers.

Conditions in Hawaii

Past and current policies. To date, the Hawaii Public Utilities Commission has not addressed bypass issues in any of its proceedings, and there is no monitoring or regulation of the providers of bypass alternatives at the state level. On the federal level, the Federal Communications Commission has required reporting on bypass activity from Hawaiian Telephone along with other large local telephone companies, which has resulted in the bypass report issued last April. One notable restriction that does exist is that other utilities companies in the state cannot use their rights-of-way to provide telephone services to the public. This issue was raised when Hawaiian Electric Company attempted to supply a fiber optic dedicated line to a bank through its own rights-of-way. In this case, the Hawaii Public Utilities Commission determined that Hawaiian Electric Company would have been providing a service outside of its certificated authority, and ordered the company to limit its telecommunications activities to its own internal communications purposes.

Current extent and future of bypass activity. In general, review of the existing data on bypass and the authors' conversations with industry participants indicates that little bypass activity has developed in the state.

Service Bypass. The current extent of service bypass reported by Hawaiian Telephone to the Federal Communications Commission represents just 5.6 percent of its annual net interstate access revenues, and even less if measured relative to the annual access revenue that would be assumed if no bypass occurred.[10] This claimed loss is the lowest of the seven states for which the GTE operating companies supplied bypass data in their 1988 bypass reports, and represents roughly one-third of the average percentage of revenue claimed to have been lost in those states. Hawaiian Telephone attached to its report a partial listing of users of special access lines, which indicated that government agencies, financial institutions, and hotels are the largest users of these services.

Facility Bypass Hawaiian Telephone reported that there is no evidence of facility bypass of its interstate access services. The company concluded that those private microwave systems that are known to exist on the islands are apparently being used only for intrastate communications. To date, long distance carriers have generally not used alternative facilities to connect end users to their switches. Although both AT&T and at least one competitor have employed some interbuilding microwave links in the downtown Honolulu area for particular customers, that appears to be a rare circumstance. A number of long distance providers have used non-Hawaiian Telephone facilities to connect their switches to earth stations and undersea cable termination points, but this cannot properly be considered bypass of Hawaiian Telephone since these links are a part of their long distance networks.

There also appears to be little interest in the bypass market among potential providers of alternative network services. For example, operators of cable television systems have been able to offer certain bypass capabilities, but have not provided much service to date. One leading cable company indicated that it had been approached in the past by a hotel and a holding company interested in bypass opportunities, and had conducted its own feasibility study. However, the company found it difficult to assess demand for telecommunications services and noted that most applications would require new facilities and investments.

Stakeholders concerned with the determination of bypass policies. The stakeholders in the issues surrounding bypass activities include both suppliers and users of telecommunications equipment and services. The local telephone company, in this case Hawaiian Telephone, is the major stakeholder on the supply side, since most bypass policies would directly affect its rates and offerings. Bypass policies can also affect the operators of other distribution networks with the potential to provide alternative services. These include cable television companies such as Oceanic Cablevision and McCaw Communications; cellular system operators such as Land Mobile Communications (an affiliate of Motorola); and other utilities such as Hawaiian Electric that own extensive rights-of-way. The most numerous suppliers are the vendors of equipment that can be used for bypass applications. These include microwave equipment suppliers such as Motorola and Rockwell; providers of fiber optic systems, including AT&T, American Lightwave Systems, and Pirelli; and satellite dishes and electronics, such as Contel. Several of these suppliers are currently without specific offices in the state, but growth in demand could increase their tendency to establish a stronger state presence.

The largest group in the category of users of telephone services is precisely those for whom bypass alternatives are not readily available, namely the class of residential and small business ratepayers. The large businesses and institutions that would be directly affected by bypass policies includes federal, state, county, and municipal government agencies, the branches of the U.S. military, the University of Hawaii and other educational institutions, and the spectrum of hotels, financial services firms, and other major corporate interests that comprise the class of likely bypassers. In addition, long distance carriers including AT&T, MCI, US Sprint, and Long Distance USA (a Hawaii-based company) would be directly impacted by actions taken to deter bypass.

Policy Options

Given the limited extent of bypass activities within the state, the most obvious implication is that no particular State policy or regulation is required. In other regions where bypass has been judged to be a present or future area of concern, policymakers have considered the following options that could be implemented in the Hawaii environment:

(1) Imposing regulation or other restrictions on alternative service providers or private network operators.

(2) Reducing the incentives for uneconomic bypass by requiring telephone company rates to better reflect the underlying costs of service.

(3) Permitting the local telephone company to charge lower, deaveraged rates for service in highly competitive regions and along highly competitive routes.

(4) Encouraging the local telephone company to be more responsive to large users' needs for technologically-advanced and high-quality services, by establishing service quality guidelines, for example.

(5) Establishing procedures for monitoring the usage of local service alternatives and periodically reassessing their potential impact.

Analysis

In evaluating these options, Hawaii policymakers should consider their relation to the goal of promoting the overall economic development of the state, as well as the specific impacts bypass policies may have on Hawaiian Telephone and ratepayers. Within the broader context of economic development, it is important to make a distinction between two potential results of bypass, actual revenue *loss* versus revenue *diversion.* Revenue loss occurs when an existing telephone customer reduces or entirely abandons service. In contrast, revenue diversion refers to the reduced growth in telephone company revenues that may occur when a potential telephone customer chooses to bypass. There is in fact an implicit question of policy hidden within the concept of revenue "diversion" - namely, the degree to which the local telephone company is entitled to serve all of the local telecommunications needs that arise within its franchised service territory.[11]

From an economic standpoint, a reasonable answer is that the local telephone company should provide services to all customers for which it is economically efficient to do so. Conversely, in those situations in which it may be inefficient for the local telephone company to provide service, customers should be free to find and utilize the most efficient alternative. This argument is equally valid for all forms of "bypass", and is reinforced by the goal of promoting statewide economic development. Therefore, where economic efficiencies are available through the use of alternative telecommunications and they can be exploited without countervailing harm to social policy objectives, those efficiencies should be encouraged.

Policies which rely on disincentives to action are unlikely to have this effect. For instance, while direct regulation or restrictions on bypass could inhibit its potential growth, this option could also eliminate truly cost-effective applications of innovative telecommunications that can support new economic growth. The other policy options are oriented toward providing positive incentives to motivate potential bypassers to use the services of the local telephone company. Some of these options may be appropriate remedies, if and when a significant bypass threat appears.

The Public Utilities Commission already has the statutory authority to implement all but one of these policy options at its discretion, since each policy involves the regulation of Hawaiian Telephone's rates and services. The exception is the first option, direct regulation of bypass service providers or private networks. As discussed in Chapter 4, under current Hawaii law the Public Utilities Commission is required to regulate certain forms of bypass activity. Private companies that engage in bypass for their own use and suppliers of bypass equipment do not fall within the scope of the Commission's jurisdiction. However, any company that intends to offer bypass services

to the public has the status of a public utility, whose rates and terms of service must be regulated by the Commission. Since bypass appears to be a minimal problem in Hawaii, the Legislature might consider granting the Commission greater discretion in its regulation of bypass services providers.

This could be accomplished through legislation amending appropriate sections of the statute governing regulation of telecommunications activities. Such changes would be designed to allow the Commission to choose through a rulemaking procedure - guided by the public interest - whether to regulate, and in what manner and degree, the provision of bypass services within the state. The Legislature might also direct the Commission to keep it advised of the level of bypass activity occurring within the state, in order to insure that bypass will continue to have little effect on Hawaiian Telephone and ratepayers in the future.

Notes

1. *In the Matter of MTS and WATS Market Structure:* Third Report and Order, CC Docket 78-72, Phase I, FCC 82-579 (February 1983), paragraphs 30, 31.

2. *Id.,* at para. 78.

3. *Bypass of the Public Switched Network,* Common Carrier Bureau (December 1984), p. 31.

4. *Telecommunications Reports,* vol. 53 no. 22 (June 1, 1987), p. 13.

5. *U.S. v. Western Electric, Civil Action 82-0192*, Opinion (September 10, 1987), p. 36 fn. 68.

6. *Telecommunication Reports,* v. 53 no. 32 (August 10, 1987), p. 13.

7. Case 28710, *Order Instituting Bypass Investigation,* New York Public Service Commission (December 27, 1983)

8. California Public Utilities Commission, Cases 83-01-22 et al (Phase III), Final Opinion (6/26/87), p. 49.

9. *Id.,* p. 46.

10. GTE Operating Companies Tariff Review Plan, vol.1 (October 1987), form COS-1(P)32 for Hawaii; GTE Operating Companies' Federal Communications Commission Bypass Report, Docket 87-339 (April 1988), p. 2.

11. The terms "diversion" and "bypass" are both biased toward the implication that the local telephone company is entitled to serve *all* of the local telecommunications needs occurring within its serving area.

Chapter 6

Shared Tenant Services

The introduction of shared tenant services should provide small and medium sized businesses in Hawaii the opportunity to take advantage of advanced technologies, and to save money on their telephone service. Increased efficiency and cost savings will help minimize any impact that shared services will have on overall Hawaiian Telephone revenues. Regulation should assure that customers have unrestricted access to Hawaiian Telephone services if they so desire, and should prevent shared system operators from abandoning their customers without notice. Further regulation of these activities, or discriminatory pricing policies, is probably unnecessary, and might inhibit the development that they would foster.

Issue Summary

Shared Tenant Services (STS)[1] are telecommunications services provided through a customer-owned switchboard known as a private branch exchange (PBX) that enable small and medium-sized businesses (and in some cases residential communities) to take advantage of shared calling benefits. By pooling their resources, businesses are able to share local telephone lines, thereby reducing the total number of lines required from the local telephone company to serve that group of customers. STS providers are typically landlords or real estate developers who provide telephone service to tenants or occupants of multitenant buildings, complexes, or developed properties as part of an overall package of services. The service package may include enhanced services such as voice mail or data and word processing, as well as office automation services including heating, lighting and air conditioning control, and building security. The advantages of STS to tenants consist of lower prices for telephone service than they could obtain from the local telephone company, as well as access to these special features which they might not otherwise be able to afford. The advantage to landlords is the revenue margin they can earn from providing STS throughout a building complex, and the ability of special telecommunications capabilities and prices to attract tenants to a development.

Shared tenant services have received considerable attention in recent years, both for the opportunities they present to users and developers and for the potential problems they can pose to local telephone companies and their ratepayers. STS ventures have only become relatively common since the introduction of sophisticated PBX switchboard systems in the mid-1970s. As PBX technology has improved, and costs have declined, individual companies have found that the use of on-premises switches for internal calling and shared use of outside lines (known as "trunks") can be a less expensive alternative to telephone company services such as Centrex that provide many connections to the local telephone company's switches.

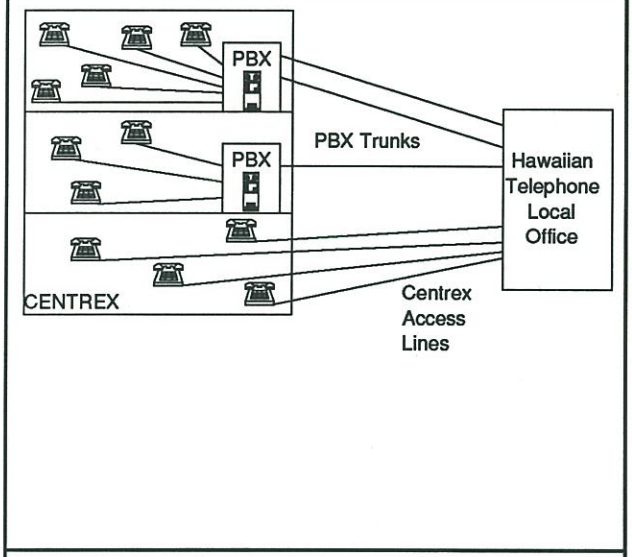


Figure 6.1 PBX, Centrex

As Figure 6.1 shows, a PBX owner - in this case, the companies on the top two floors of the building - needs fewer lines to the telephone company switch than does Centrex, since communication within the building can be accomplished entirely through the PBX, and only calls connecting with the outside world need be processed at the central office. Rapid growth in the use of PBXs has led to a decrease in the use of Centrex-type services for most local telephone companies. This has been especially true for larger customers. Hawaiian Telephone, in fact, discontinued its Centrex service for new customers in 1986, replacing it with the present SELEX service, which is available only to customers requiring 100 station lines or less.

The incentives to institute STS-type systems are precisely parallel to those encouraging PBX use over Centrex. Figure 6.2 shows how a STS system involves combining the traffic of several different users on the same premises onto one shared (albeit larger) PBX. The result, from the users' point of view, is that their combined traffic can be efficiently served at a lower average cost. Internal calling can be provided entirely out of the shared switch, including calling between unaffiliated companies in the same complex, and traffic to and from the local telephone company can be combined on fewer total local trunks than would be needed if the companies ordered service separately from the local telephone company. Additional advantages can be gained through joint arrangements to obtain bulk rates from long distance companies.

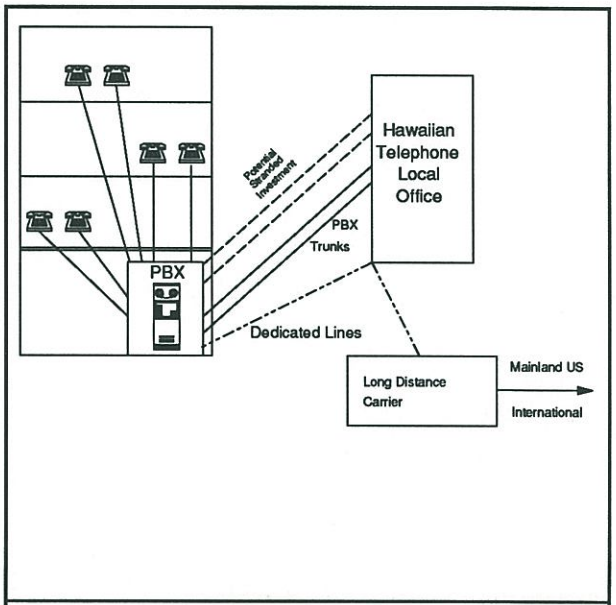


Figure 6.2 STS

Figure 6.2 also points out one aspect of the controversy over STS that has been raised in many jurisdictions. In general, policymakers have expressed concern that the replacement of functions traditionally provided by the local telephone company with other facilities, and the reduced use of telephone company lines and equipment, will result in reduced revenues to the local telephone company without a commensurate reduction in costs. This problem can be especially disturbing if

STS providers establish themselves in locations where the local telephone company has already engineered its local network in anticipation of serving all customers individually. In such instances, STS would result in fewer total lines being used than the local telephone company planned for and installed, and thus the cost of the additional lines might not be recovered through existing rates. This phenomenon has been called "stranded investment," since telephone company investments in facilities may find no use in a particular area, but must still be paid for through regulated rates. In effect, stranded investment and lost revenues in general due to STS could lead to overall telephone rate increases, meaning that the general body of ratepayers would be paying, in some sense, for the benefits that users of STS would enjoy.

Approaches Elsewhere

Most states have initiated investigations and implemented policies regarding shared tenant services, with the majority openly permitting the practice, but varying in the extent and type of regulation thereof. In the Hawaii Public Utilities Commission's initial investigation of STS (Docket No. 5660), two parties, Hawaiian Telephone and Kakaako Venture Limited, have submitted summaries of state actions concerning STS. In other regions of the country, there is no consensus as to either the jurisdiction that state regulatory commissions may have over STS providers, nor the specific policies that apply both to STS providers and to the services they purchase from local telephone companies. Many states mandate that STS providers purchase only measured local trunks, which result in per-minute charges for all calls from an STS location; this practice assures the local telephone company that the STS customer will pay for any increasing usage on the network and will not overload the company's trunks. Almost all states require that alternative access to local telephone company services be available to tenants of STS complexes. A brief summary of representative guidelines and regulations governing shared tenant services in Missouri, California, and North Dakota follows.

Missouri. The Missouri Public Service Commission issued an order establishing permanent tariffs and service standards for the provision of shared tenant telecommunications services on April 19, 1988. The order established, among others, the following standards:

1. Since STS is only one part of a package of services offered to a group of customers, and is offered only for private, not public, use, an STS provider would not be considered to be a public utility.

2. Local telephone companies are required to be providers of last resort to end users in buildings served by STS which are later abandoned by the STS provider.

3. STS need not be limited to connection through a single private branch exchange (PBX), however, local telephone companies are required to provide only one point of termination to connect STS facilities with the local telephone company network.

4. A provider of STS will be charged according to the rates used for access by private branch exchanges (PBXs). STS access charges should be priced residually and reflect the flat trunk rate already used for PBX access.

5. A provider of STS must give 180 days notice to the local telephone company of its intent to offer service in a new building, but such a notice period does not apply in existing buildings.

California. On January 28, 1987 the California Public Utilities Commission issued an order which included the following STS guidelines:

1. An STS provider may offer services to tenants in a single building or complex of buildings on continuous property. The shared tenant service provider is the customer of the utility.

2. If STS providers operate under certain guidelines they are not subject to Commission regulation.

3. The STS provider may charge for its management and billing services and for its use of its facilities in any manner it chooses including flat or measured service charges.

4. All telephone utility and long-distance carrier service charges shall be directly rebilled to tenants on a flow-through or pro rata basis and shall be separately stated on the bill.

5. Service may be extended to residential premises located in the specific complex, but business rates will apply to private business exchange trunks and other facilities.

6. The property owner or manager is not allowed to place restrictions on tenants who desire service directly from the local telephone company, and similarly may not impede the local telephone company from furnishing service directly to a tenant.

North Dakota. In an order dated October 7, 1986, the North Dakota Public Service Commission established service regulations for shared tenant service. Based on the assertion that resale of local telephone company services fosters competition and provides more efficient service by more closely matching consumer needs to available technology, the Commission found that resale of local services would be beneficial to North Dakota citizens. The order stipulated that the local telephone company may file tariffs at rate levels that protect against stranded plant and revenue loss. The Commission limited STS provision to a contiguous building complex, new or old, or a community of interest, business or nonbusiness. With the exception of residents of dormitories or residence halls of schools, colleges or universities, the end user has the right to choose service from the local telephone company in place of, or in addition to, service furnished by the STS provider. In addition, the local telephone company is permitted to use STS provider's intra-building cable and wire in the event that an end user requests local telephone company service. STS providers in North Dakota must register with the Commission and provide annual reports of revenues, expenses, capital investments, return on investment, area serviced, services offered and number of customers.

Conditions in Hawaii

Policies. As discussed in Chapter 4, the Hawaii Public Utilities Commission initiated Docket No. 5660 on September 19, 1986, for the purpose of investigating issues relating to STS in Hawaii. The Commission sought comments from interested parties, including Hawaiian Telephone, the Consumer Advocate, and potential STS providers, concerning three principal questions: (1) whether

STS should be allowed in Hawaii; (2) if STS is allowed, whether or not the providers of STS should be regulated; and (3) what rules and regulations and rates should be established for STS to best serve the needs of telephone consumers in Hawaii. A related threshold issue raised by the Commission was the legal question of whether STS systems should be considered public utilities subject to the Commission's jurisdiction. In the initial stages of the proceeding, the major parties agreed to a definition of shared tenant services under the term "Common Premises Communication Systems," which the Commission adopted as the pertinent definition for purposes of the case, and of policy development in Hawaii. The definition is as follows:

> Common Premises Communications System (CPCS) is defined as a telecommunications system that offers, among other things, use of telecommunications switching equipment and services which provide access to the public switched network, to occupants of common premises. The same individual, partnership, or corporation shall own, lease rent or have obtained licenses for all components of the CPCS, and shall also be affiliated with the owner, lessor, or renter of the common premises either by common ownership or by contract. Common premises is defined as a building or set of buildings that are: (1) owned, leased or rented by an individual, partnership, or corporation, and where the owner, lessor, or renter is not the sole occupant of the building or set of buildings; or (2) Horizontal Property Regimes, consisting primarily of individual or multiple structures that are part of a common development; or (3) any combination of (1) and (2) above when the structures are part of a common development. Single family detached dwellings are specifically excluded from the definition of common premises. [As adopted by the Hawaii PUC in Order No. 9024]

The Commission divided Docket No. 5660 into two main phases, the first to address the question of whether STS/CPCS providers are public utilities subject to Commission jurisdiction, and the second to examine regulatory options concerning their activities. Hawaiian Telephone and several intervenor parties presented initial and reply briefs focusing on issues in both areas. These submissions, and the other materials from Docket 5660, constitute the bulk of the existing public record concerning STS/CPCS in Hawaii.

Concerning Commission jurisdiction, the principal arguments revolved around the question of whether shared service providers can be classified as offering service of a "public" nature or whether they are entirely private operations. As discussed in Chapter 4, if the activity is "public," the Commission has an affirmative obligation to regulate, including ensuring that rates for the service are reasonable. The Commission, after considering the evidence, issued a ruling on this question on March 4, 1988 (Decision and Order No. 9686). The Commission interpreted existing law and precedents to conclude that "though the proposed service is limited to tenants within certain buildings, the scope of the service and the impact to the number of tenants, both residential and commercial, that may be involved would appear to make the CPCS service a service 'to the public, as a class, or to any limited portion of it as contradistinguished from holding himself out as serving or ready to serve only particular individuals.'" The last cite referred to Hawaii Supreme Court standards. In making this ruling, the Commission nevertheless observed that circumstances may differ for different shared system operators, and left open the possibility that in some cases it would

determine that shared tenant services were *not* public utility services, and thus not subject to regulation. The immediate consequence of this ruling, however, is to define STS/CPCS providers as public utilities, and to require that they obtain certificates of public convenience and necessity prior to commencing operation.

This ruling concerning Commission jurisdiction left unresolved the questions of what type and level of regulation should apply to STS/CPCS in Hawaii, the second phase of the proceeding. On September 8, 1988, in view of the Legislature's decision to authorize an independent review of policies regarding shared tenant services, the Commission continued Docket No. 5660, pending the results of this study.

Markets. There does not yet exist any shared tenant service in Hawaii, and it is unclear what the overall market potential for this type of activity would be. It is possible, as some prospective STS operators have claimed, that the market for shared services would be quite large, and would encourage innovative uses of telecommunications in Hawaii and general economic growth. The potential magnitude of such growth cannot be measured, however, without the benefit of at least some initial experience. Similarly, it is difficult to estimate how much of Hawaiian Telephone's existing or future revenues might be at stake if STS providers were to enter the market. The best general measure of these factors derives from data concerning Hawaiian Telephone's existing services to businesses, particularly those that would be likely candidates for STS-type operations.

As of 1985, Hawaiian Telephone provided some 12,000 PBX trunks to customers, representing anywhere from 50,000 to 100,000 total station lines (end user telephones), depending on the size of the businesses involved. The vast majority of these trunks (about 10,000) were located on Oahu. At 1988 rates, this total demand would yield Hawaiian Telephone about $7.4 million annually. Other 1985 customer categories that would appear to be candidates for STS included subscribers to Joint User service and Centrex customers. Between these two groups, Hawaiian Telephone served an additional 17,000 to 18,000 station lines, which generated some $4 million in revenue. These customer groups, by subscribing to explicitly multi-line services, are perhaps the most likely candidates for STS arrangements, but even smaller companies that only purchase a few individual business lines might move into shared tenant complexes.

It is widely anticipated that STS complexes would primarily be in new developments, and thus would purchase new Hawaiian Telephone services as opposed to replacing existing services. To the extent this is the case, a better measure of their potential market would be the growth in multi-line business customers (including those that merely buy more than one standard business line). Hawaiian Telephone's 1985 data showed annual growth of more than 10,000 lines in this category, covering over 3,000 separate customer accounts. The per-line annual local service revenue from these customers varies from island to island and with the nature of service they purchase, but a rough estimate would be $400 to $500 per line per year. This would suggest that, at the 1985 growth rate, Hawaiian Telephone revenue growth susceptible to some level of usurpation by new shared system complexes would be in the range of $40 million to $50 million. Of course, even the most efficient STS provider could reduce total payments to Hawaiian Telephone by no more than about 50% to 60% for the same level of customer demand. Thus the total market opportunity suggested by these estimates would be in the range of $25 million per year for new STS providers, with a comparable level of Hawaiian Telephone revenue growth subject to diversion to the STS market.[2]

To the extent that shared system operators were successful in entering existing buildings, or in persuading existing businesses to move to the new developments, their revenue opportunities would increase somewhat, and Hawaiian Telephone's revenue base would decline.

Stakeholders. Nearly all of Hawaii can be said to have a direct or indirect stake in the issue of STS. In addition to Hawaiian Telephone and its ratepayers, who have a stake in the possible cost and revenue impacts of STS, the business community in general stands to be affected by the availability of low cost, technologically advanced communications systems that STS providers would seek to offer. To the extent such systems truly involved the latest advances in technology, the opportunities for improved productivity, new markets, and overall economic growth could be considerable. Finally, there are several specific stakeholders, who have considered or have already begun to develop plans for the implementation of STS, assuming the regulatory climate is favorable. Kakaako Venture Limited, which is developing a large new office and residential park at One Waterfront Plaza, was until recently among the most visible of these entrepreneurs, but has since decided to forego implementing a shared telephone system, largely due to the uncertain regulatory climate surrounding the issue. Outrigger Hotels Hawaii, Wang Laboratories, and VIP Connections - all intervenors or participants in the PUC's investigation of STS/CPCS - are also among the leading prospective developers of shared tenant services; should their ventures prove successful, there will undoubtedly be many other entrants into the market.

Policy Options

There are a wealth of possible policies that could be implemented regarding STS, with respect to shared communication services themselves and to Hawaiian Telephone's rates and services provided to STS operators. Following are some of the principal policy decisions that need to be addressed in this area.

1. Should STS be allowed at all in Hawaii? That is, should the PUC grant certificates of public convenience and necessity to proposed shared service operators under any circumstances? If so, should the PUC deny certification under some conditions, such as when the replacement of existing Hawaiian Telephone services with STS would result in substantial stranded investment and/or revenue losses?

2. What trunk rates should Hawaiian Telephone be required to charge for STS access to the public network? Should trunk rates be the same as existing PBX rates, or should they be greater to reflect likely higher use levels on STS lines? What methodology should be used to estimate the extra cost of above average trunk utilization for rate setting purposes?

3. Should tenants in complexes served by STS be guaranteed access to Hawaiian Telephone services as an alternative to the shared services? Concomitantly, should Hawaiian Telephone be required to serve all tenants who desire its services as a carrier of last resort? What regulations should be imposed to govern Hawaiian Telephone access to customers, and to inside wiring?

4. Should STS providers have an obligation to serve all tenants of their complexes, regardless of their telecommunications needs or the costs of serving them? Under what conditions can STS providers decline to provide a given service, or to serve a given tenant?

5. Should there be any regulations regarding the grade or quality of service provided by shared system owners to their customers? Should STS operators be obligated to offer the same grade of service (probability of call blockage) as Hawaiian Telephone provides?

6. Should the specific rates and rate structures of STS be regulated by the PUC? If so, what types of rate structures will be allowed? Will measured service charges be permitted within STS complexes while they are prohibited for Hawaiian Telephone's public network services? Should there be rate ceilings or other restrictions on rate levels? Should price discrimination be allowed, or must STS providers charge the same rates to all tenants in a complex?

7. Must STS operators provide notice to Hawaiian Telephone prior to abandonment of service? How much advance notice should be required? What termination liabilities or security deposits should be required of STS operators?

8. Other issues: Should STS operators be required to register their equipment with the Federal Communications Commission? Should there be limits on the total size of a shared system, or on the number of buildings in an STS complex? Should STS operators be allowed to resell intrastate long distance or other non-basic services? Should STS operators be allowed to offer dial-up services to the public?

The analysis in the next section does not attempt to answer all of these questions, but presents a framework in which policymakers can evaluate the issues, and a discussion of the economic forces and impacts associated with the major policy questions.

Analysis

STS Costs and Benefits. The threshold issue of whether to allow STS and under what circumstances involves in large part empirical questions of the extent of possible revenue losses and stranded investment versus the benefits that might be derived from STS. One important distinction must be made between STS installations in *new* buildings and complexes, and those that might be installed to replace existing telephone services in older buildings. Shared service arrangements can be achieved at relatively lower cost in new construction, because the wiring plan for the distribution of telecommunications services can be incorporated into the basic building architecture. When STS plans are included in the development of a location, such as contemplated for One Waterfront Plaza, there is no reason to expect that the telephone company will confront stranded investment, since it will be able to plan for the shared system accordingly. There is also no real "loss" of revenues in such an instance, because the new tenants and shared services are not displacing anything that existed previously.

Retrofitting existing buildings to accommodate shared services is more complex than new construction. In these cases, STS could well create idled telephone company facilities, if the location of the building is in an area that has already been engineered to serve a large number of tenants on an individual basis. But because such retrofitting involves additional costs to the STS provider, it is less likely to occur than in new complexes. Moreover, there are likely to be offsetting cost savings,

as well as possible revenue stimulation, from STS that must be weighed against any adverse effects due to stranded investment before one can determine that, on balance, any particular shared tenant service operation would be harmful to Hawaiian Telephone.

There are three major sources of cost to Hawaiian Telephone in connection with the provision of local exchange access and usage services. These are (1) the non-traffic-sensitive (NTS) costs of the basic access lines connecting the telephone company central office with the customer location, (2) the traffic-sensitive costs associated with the level of usage of the local telephone company network generated by the customer, and (3) the per-customer costs of account administration and billing. As described below, Hawaiian Telephone could well realize cost savings in all three of these areas when multiple users participate in an STS arrangement.

Non-traffic-sensitive access line costs. By combining the traffic associated with a number of individual customers within a common group of exchange access lines, Hawaiian Telephone can realize a substantial reduction in the quantity of such facilities that are required to handle a given volume of calling.

Traffic-sensitive costs. While traffic-sensitive costs are often thought of as varying with the level of *usage*, in actuality these costs depend upon the simultaneous *capacity demand* presented to the switching and interoffice networking facilities. By combining a number of individual customers' requirements onto a common group of facilities, Hawaiian Telephone will experience a potentially large reduction in the *combined* level of capacity demand presented by the group as compared with that which would exist were all of the individual participants served directly by the telephone company. This could allow Hawaiian Telephone to handle the same volume of *total usage* with fewer switching and network facilities, and hence at a lower overall cost. Hawaiian Telephone will also enjoy an additional, although small, reduction in traffic-sensitive costs arising from the ability of the shared PBX system to handle intrasystem traffic between individual participants in the STS system without having to utilize central office switching facilities.

Account administration and billing. Hawaiian Telephone will enjoy a significant savings in the costs it would otherwise have to incur to administer each of the participants' individual accounts when these users join in a common sharing arrangement. Instead of maintaining a large number of small accounts and having to prepare and administer a large number of small individual bills, the telephone company will be able to deal with a single, larger entity, an entity that will itself assume the obligation to maintain the required customer relationships with its own end users.

In addition to these cost savings, Hawaiian Telephone will not necessarily, in the wake of the introduction of shared tenant services, lose all extra revenues that individual customers would have paid in the absence of STS. The effect of STS for tenants is to lower the cost of basic and specialized telecommunications services below what they would have otherwise paid for a given volume and type of service. If offered such service at lower prices, many tenants may elect to purchase services through the STS vendor that they might not otherwise have chosen because of cost constraints. This type of *demand stimulation* is at the heart of competitive market economics, and is very likely to occur in STS situations where tenants are medium and smaller businesses that must balance limited

resources with the desire to expand their operations. To the extent sharing of Hawaiian Telephone services thus creates additional demand, the telephone company will recapture some of the revenues it ostensibly "loses" by not serving customers directly.

It is thus not clear that even STS installations in existing buildings will be consequentially detrimental, all other things equal, to Hawaiian Telephone and its ratepayers. In new developments, the efficiencies of shared usage will be available with almost no risk of stranded investment or Hawaiian Telephone revenue loss, and thus would appear to offer positive net benefits to the STS providers, end users, and Hawaiian Telephone alike. There would appear to be little reason, therefore, to summarily exclude STS from the Hawaii market. In those cases where an STS system proposed for an existing building or complex might lead to substantial net costs to Hawaiian Telephone, the Public Utilities Commission may wish to examine the merits of such a system independently, in the context of a review of its application for certification. In most cases, however, STS development is likely to offer net benefits to the State.

Regulations Concerning STS. Notwithstanding the above discussion, there remain serious questions as to whether Public Utility Commission regulation of various aspects of STS is necessary to ensure that the benefits associated with shared services arrangements will be realized, and that customers both of Hawaiian Telephone and of the STS providers will be protected. In its briefs before the Public Utilities Commission, Kakaako Venture asserted that regulation of STS providers is unwarranted because (among other things): (1) STS tenants will always have the option of subscribing to Hawaiian Telephone services in place of the STS offerings, and (2) STS providers will reserve the right to refuse to serve certain tenants whose needs may engender greater costs than the STS system operator is prepared to bear. Yet these assertions alone raise important policy questions.

Without some specific requirement, and associated monitoring and enforcement mechanisms, it is not clear that all STS providers will in fact permit customers the option of subscribing to Hawaiian Telephone services, and will allow Hawaiian Telephone the necessary access to customers and to inside wiring, at reasonable compensation fees, to assure that the alternative is viable. At the least, the availability of Hawaiian Telephone service should thus be a *requirement* of STS systems, rather than an expectation that is left to their good intentions to uphold. At the same time, Hawaiian Telephone should naturally be required to serve all tenants in an STS complex who desire service. If these requirements are established, they can override any concerns about the reasonableness of STS rates, and whether the PUC should, in its capacity as regulator of public utilities, affirmatively fix the rates for shared tenant services. With Hawaiian Telephone services readily available to all tenants, STS providers should not be able to charge rates that exceed those for Hawaiian Telephone's equivalent services. Similarly, there would be no compelling need to mandate rules concerning rate structure, since again the worst any tenant could do under any form of STS pricing would be to abandon the shared services in favor of traditional Hawaiian Telephone services and rates.

The other side of the issue of competitive availability of Hawaiian Telephone service is represented by the assertion that STS providers will reserve the right to deny service to certain customers. This issue focuses on the broad question of non-discrimination, and whether market forces and the availability of Hawaiian Telephone as a carrier of last resort will adequately prevent any

disadvantage to STS customers or to the general body of ratepayers arising from discrimination within an STS complex. It is clear that the highest rates that STS providers could charge customers would be essentially equal to Hawaiian Telephone's rates for similar service. Thus, if an STS provider wished to deny service to a tenant, it could merely insist on an exorbitantly high price from that tenant, and force the customer to opt for Hawaiian Telephone. In the absence of any PUC regulation of rates, there would be no particular reason why STS operators could not implement *rate discrimination* of this type. More explicit discrimination would involve simply refusing to serve a tenant at all (although presumably there would always be some price at which the STS operator would be willing to serve any customer).

The question that such practices raise is whether the systematic exclusion of higher cost customers from shared communication systems, and their consequent "dumping" on Hawaiian Telephone, would lead to increasing average costs for Hawaiian Telephone, which would be passed on to all ratepayers in the form of higher rates. In this scenario, STS providers would serve *only* those customers whose service needs involve incremental costs below the highest rate the STS operator could charge - i.e., below Hawaiian Telephone's rates. Any customers whose incremental cost to the STS provider is above Hawaiian Telephone's rates would be served by Hawaiian Telephone.

In order to analyze this condition, it is necessary to understand the *source* of cost variations. A tenant's telecommunications costs to an STS provider would be considered high if that tenant had an unusually high level of traffic demand *per line*, e.g., if it were a business involved in telemarketing or in a retailing function that led to high incoming usage. High usage would require the shared PBX owner to purchase additional trunks, and perhaps a larger PBX, to assure that the average grade of service (percent of calls blocked) available to all customers did not become unacceptably low. If the STS operator could directly charge the high use customer for the extra costs of this expansion, then other customers would not be burdened, but otherwise the STS provider might prefer not to serve the customer at all. From Hawaiian Telephone's point of view, however, a high use customer will produce the same traffic demand on its network whether the customer is served by Hawaiian Telephone directly or through a shared system (assuming no change in business activities occurred). Hawaiian Telephone's network costs are largely a function of *peak loading* demand - the need to engineer the network to provide an appropriate grade of service during peak calling periods. The fact that the same total usage pattern would exist under either a shared or individual serving arrangement means that there would be no difference in the average peak load between the two means of serving a high use customer. This implies that, although the cost to the STS provider to serve the customer would be higher than average, Hawaiian Telephone's *network* cost would be essentially the same under either scenario. As discussed above, other costs, related to the actual trunk facilities and to billing and administration, would be higher for Hawaiian Telephone if it served the high use customer directly, but in this instance it would also receive higher revenues. The net result is that there should be no systematic cost increase or revenue loss to Hawaiian Telephone from the direct or indirect exclusion of certain customers from shared tenant systems. The State may wish to limit rate and service discrimination within STS complexes for other reasons, but overall economic efficiency should not be a significant factor in deliberations on this issue.

The above discussion highlights some other considerations relative to regulation of STS and of Hawaiian Telephone services provided to STS operators. Just as the alternative of Hawaiian Telephone's services should provide a market check on STS rates, the quality of service that Hawaiian Telephone offers should assure that STS providers meet certain reasonable service quality standards. It may be that in a given complex the precise grade of service available through the shared system would be marginally poorer than that available from Hawaiian Telephone. However, if the alternatives are clearly known - i.e., if Hawaiian Telephone has full opportunity to market its services to STS tenants - then there is no reason why additional regulation of service quality should be necessary to protect customer interests. In fact, some customers may be willing to accept lower service quality for reduced rates, and there is no immediately apparent reason why they should be unable to make that choice, as long as it would not generally burden other ratepayers who have no choice.

The final major question regarding regulation of STS providers is whether any restrictions should be placed on *abandonment* of service. In this instance, as with the need to require access to Hawaiian Telephone, there is clearly a public interest in assuring that shared systems are not unexpectedly abandoned without notice either to customers or to Hawaiian Telephone. If an STS provider in a development were to simply close down the shared PBX overnight, customers would be left without telephone service, and Hawaiian Telephone would, in all likelihood, be unable to provide comprehensive replacement service immediately. Even if the telephone company could install replacement facilities quickly, doing so would probably involve exceptionally high costs, which would have to be borne either by the former STS customers, or by the general body of ratepayers. Adequate notice of shared tenant services termination could prevent this circumstance from occurring. The State may wish to mandate some minimum notice period, such as 180 days, and include some form of termination liability for premature abandonment of an STS operation.

All of the above discussion implicitly includes assumptions about the rates at which STS providers themselves can obtain service from Hawaiian Telephone. In some states, a separate rate element has been introduced to apply to shared tenant systems only. Such a policy would itself amount to rate discrimination, in that a shared PBX customer needing, say, 500 lines, would not be able to purchase those lines at the same price as a single large company operating an identical PBX and requiring the same number of lines. The purpose of combining traffic onto a shared PBX is to allow smaller companies to take advantage of the efficiencies available to larger companies, and thus to improve the overall economic climate relative to telecommunications. If shared systems were charged higher rates simply because they are available to small and medium sized businesses, the business climate would certainly suffer; at the same time, it is not clear that the telephone company and its customers would necessarily benefit. Higher STS rates would reduce the incentives to create shared systems, and would diminish any demand stimulation that would have otherwise occurred. There is no *a priori* certainty that the net result of such a scenario would be greater revenues for Hawaiian Telephone, nor that any such revenue gain would offset the economic benefits engendered by STS.

Notes

1. The term Shared Tenant Services or Shared Telecommunications Systems (STS in either case) is generally used in the industry. In Hawaii, the parties in Hawaii PUC Docket No. 5660 have agreed upon the term Common Premises Communication Systems (CPCS). This report will for the most part refer to the more common usage, STS.

2. Using the $25 million figure as a high end estimate for the potential diversion of revenues that could subsidize residential services, the maximum average impact per residential customer would be about $75 per year. Since most of the revenue diversion would be from revenue *growth* rather than existing subsidies, it is unclear how much, if any, of this would actually translate into higher rates for residential customers, even under the most extreme assumptions.

Chapter 7

Customer Owned Coin Operated Telephone Systems

Competition in the provision private coin telephone service is increasing throughout the country, and Hawaii is one of only a handful of states that still prohibit competitive entry in this area. Innovations in the technology of coin telephones have led to many enhancements in service and capabilities, which a competitive market would likely encourage. Ratepayer interests can be protected by requiring private coin telephone operators to pay rates to Hawaiian Telephone for local access service that will recover most of the revenues that Hawaiian Telephone would stand to lose due to competition.

Issue Summary

Along with all other elements of the telecommunications world, the market for private coin or "pay" telephone service, also referred to as Customer Owned Coin Operated Telephone Systems (COCOTS),[1] has been changing rapidly in the past few years. In 1984, at the same time as the Divestiture of AT&T was going into effect, the Federal Communications Commission ordered the deregulation of the private pay telephone industry. Since then, technological innovation in the underlying public switched network, as well as in the pay telephone instruments themselves, has combined with changing economic and policy trends to fundamentally alter what was once a homogeneous and unimposing industry.

The basic question confronting the State of Hawaii with respect to COCOTS is simply whether the State wishes to participate in this newly competitive market, or to continue with the traditional exclusive local telephone company provision of pay telephone service. If the State were to choose to allow competition, there would be numerous other specific policy choices to be considered, as discussed below. In the first instance, however, it is necessary to ask whether there are potential benefits to be achieved from the introduction of competition, and whether those benefits might outweigh any countervailing costs.

Some of the developments in the pay telephone market have been spurred by the changing overall structure of the telephone industry - e.g., the introduction of public telephones which accept all long distance telephone company calling cards, or allow selection of a preferred long distance telephone company. Other changes result from the increasing availability of Touch-Tone or Digital signalling functions, from new processing capabilities inherent in telephone company switches and in remote switching facilities, and from changing public needs and interests. In only a few years, this industry has begun to develop, and is beginning to influence service provision policies for both private users and public agencies around the country. A wealth of new manufacturers and service vendors has appeared, offering a wide variety of new capabilities, service arrangements, and the concept of competition in a traditional monopoly market.

In virtually all telephone markets, the provision of public and semi-public telephone service has been traditionally the role of the monopoly local telephone company. These services involve the connection of telephone sets in public places, or in private businesses (in the case of semi-public telephone service), to the public switched network. Use of the telephones is effected by either depositing coins or calling an operator to make a collect, third party, or credit card call. Among the many new developments in the industry is the increasing availability of "coinless" telephones that can operate directly from telephone company or commercial credit cards; in some cases, these types of telephones can be used only to make long distance interexchange calls. Finally, certain capabilities have generally been available for free from pay telephones, including 911 emergency service, and directory assistance.

The connection of pay telephone instruments to the local telephone network is obviously necessary to provide for local calling, but what has changed is the notion that other elements of the service, from the installation and maintenance of the instruments themselves, to the billing, collection, operator services, and features associated with pay telephones, should be solely provided by the local telephone company. Competition in the pay telephone market has thus involved permitting other companies to own and operate the actual telephone sets, collect the revenue therefrom, and reimburse the local telephone company only for the access connection to the local network (at a tariff rate specifically designed for COCOTS). Such competition can involve the mere private ownership by a restaurant or shop owner of the handful of pay telephones on his premises, or the replacement of some or all local pay telephones on public property in a given location (such as an airport, or even a city) with a new system operated by a private company. In the latter instance, the government authority will offer a franchise to the alternative pay telephone service provider that may include specific service requirements, rate levels, and commission fees, usually as the result of a competitive bidding process. In this respect, the "competition" in the pay telephone market does not generally take the form of multiple service options at any one location, but rather occurs in the bidding process, prior to the establishment of an alternative *de facto* monopoly provider of the service. COCOTS is also often considered to be a *resale* issue, because third parties purchase connections from the local telephone company and sell the same capacity to pay telephone users.

Approaches Elsewhere

Since the federal deregulation of COCOTS, there has been rapid movement in many states to open the market to competitive entry. At this time, Hawaii is one of only four states, along with Arkansas, Oklahoma, and Connecticut, that do not permit competitive provision of pay telephone service for local calling. These states, moreover, are considering altering their restrictions. The remaining 46 states and the District of Columbia permit COCOTS, with varying levels of restrictions and regulations. Following are brief summaries of some of the analysis and actions taken in other states with respect to COCOTS.

The Arkansas Public Service Commission (PSC) in 1986 became one of the few state commissions to explicitly prohibit the introduction of private pay telephones. The Commission found no evidence of any particular benefit to the public from COCOTS and expressed concern that the

local telephone companies in the state would experience revenue losses from competitive coin telephones that would not be adequately recovered through tariff provisions addressed to COCOTS. In particular, the Commission ruled:

> That the record in this docket does not contain *sufficient factual data* or information in order for the commission to determine whether COCOTS telephone competition will result in higher or lower prices for telephone service; whether COCOTS competition would increase or decrease the availability of coin telephones; whether opening the technological marketplace to a multitude of variously programmed, customer-owned, coin-operated telephones will promote convenience or confusion; whether competition will constitute economic advantage or disadvantage to the local telephone companies; whether it is possible to design a tariff with a reasonable expectation of replacing the revenue that may be lost by the displacement of local telephone company plant; and whether competition can provide an equitable substitute for regulated monopoly, coin-telephone services. (Arkansas PSC Docket No. 84-211-R, Order No. 8, February 21, 1986)

In short, the Arkansas PSC was unconvinced that a change from the *status quo* would serve any positive purpose, and seemed inclined to believe that adverse consequences would result from COCOTS. In this opinion, however, Arkansas was in the distinct minority, as most other state commissions have assumed that the introduction of COCOTS can be accomplished without detrimental revenue effects on the local telephone company, and with at least some expectation of social benefits due to innovation, greater availability, and improved service.

For example, the New York Public Service Commission's ruling on the same issue, at virtually the same time as the Arkansas decision, is typical of the positions that the majority of state commissions have taken on COCOTS. This ruling dealt not with private pay telephones, which were already permissible in New York, but with the expansion of pay telephone competition to public locations, including city streets and public offices. The Commission concluded that it was no longer necessary to restrict the location of COCOTS to residential or private business premises. Although the Commission expressed misgivings about the existing status of COCOTS service, it anticipated that the continuing development of the market would make widespread introduction of public service feasible:

> [O]ur experience with the overall quality of service provided by COCOTs to date gives us cause for concern about immediately opening the market to all locations. . . . Our staff reports that users found many models difficult to operate, particularly when the users had not taken the time to read instructions prior to using the phone. . . . Fortunately, there are indications that most of these problems will soon be ameliorated, if not eliminated, by the introduction of new vintages of COCOTS equipment of a quality equal or superior to the quality of central office-controlled coin telephones provided by telephone utilities. (Memorandum, Order, and Resolution, NYPSC Case No. 27946, February, 1986, pp.9-10)

This kind of equivocal endorsement of COCOTS, whether for public service or private ownership, is fairly representative of the opinions of other state commissions. The expectation that technological improvements and other advantages from COCOTS would come about if competition were permitted has been largely based upon subjective opinions, with only limited empirical experience to support them. Still, most states have been willing to allow the market to demonstrate the viability of COCOTS competition, rather than expressly forbidding it, as did Arkansas, on the basis of uncertainty.

Beyond the decision to permit COCOTS competition, states have varied in their approaches concerning the type and degree of regulations to apply to COCOTS vendors, and to the local telephone line connections that these vendors must purchase. In some states, legislative intervention has superceded public utility commission authority to regulate COCOTS, and in others such regulation has been limited to basic standards for service quality. Among the more common rules applying to COCOTS are requirements for free access to 911 emergency, operator, directory assistance, and toll-free 800 services; clear posting of ownership and service information; and limits on rates that can be charged from COCOTS for local, long distance, and operator services.

Connections to the local exchange network are usually governed by separate public access line tariffs. These tariffs typically include service connection charges, and recurring monthly charges set in relation to local business service rates. Many states require that pay telephone operators purchase measured service, to assure that the local telephone company recovers revenues on a usage basis from private vendors. A common price level is to charge 60% of the business access line rate, plus some two to six cents per minute for usage. In some states only measured public access service is available, while others permit flat rate service where measured local service is not offered. A few states do not require or even permit measured service lines for COCOTS, and seek to recover revenues from private pay telephone owners strictly through flat public access rates.

The consequences of opening up the pay telephone market in these states have also varied, but for the most part the growth of competition has been steady but slow. The average number of private pay telephones, as opposed to those still owned by the local telephone company, is only a few thousand per state. On the whole, privately owned pay telephones nationally account for less than 5% of the over 1.5-million pay telephones located in Bell Operating Company territories, and a somewhat lower percentage of pay telephones in independent company territories. Although there is an increasing interest in many areas in installing private pay telephones, the entrenched telephone companies retain a position of vast dominance.

In contrast to semi-public and private COCOTS, municipal replacement of public telephone company pay telephones with competitively procured alternative systems is an especially new trend. A few cities have been exploring this avenue, for purposes of revenue enhancement or other municipal goals, and recently New York City announced its intention to seek competitive bids for pay telephones on public property, easily the largest proposed procurement of its kind. The most common public agency pay telephone procurements have been for isolated government-run facilities, such as airports, military bases, and public park areas. These purchases typically involve no more than 100 to 300 stations, and thus present far less risk, and a greater opportunity for field testing and experimentation, than is presented by a city-wide procurement of many thousands of

units. Even in this area, however, pay telephone replacement programs have been sparse so far, and the market still depends primarily upon private COCOTS, that is, end user purchases of relatively small systems.

The largest private pay telephone procurement to date (before New York's proposed program) is the recent award by the Army and Air Force Exchange Services (AAFES) of a $120-million contract to AT&T for service at 121 military bases around the United States. This procurement, for which AAFES received thirty bids, called for up to 17,000 instruments to be installed at the designated bases. The fact that the winning bidder in a procurement of this magnitude was AT&T suggests that some newer entrants to the market may not yet be established and experienced enough to contend successfully for such vast contracts. On the other hand, the presence of thirty serious bidders - out of some 275 companies from which AAFES originally solicited participation - demonstrates that strong interest exists in this type of procurement, and that the COCOTS market continues to expand nationwide.

Conditions in Hawaii

Policies. The Public Utilities Commission of Hawaii considered the matter of COCOTS competition in Docket No. 5563 in 1986 and 1987. The principal questions addressed by the Commission in that docket were:

1. Is the resale of local telephone company services in furtherance of the public interest?

2. If the resale of local telephone company services through COCOTS furthers the public interest, are the providers of COCOTS public utilities and therefore subject to direct or indirect regulation by the Hawaii Public Utilities Commission?

3. What are the reasonable rates for COCOTS access (or interconnection) with Hawaiian Telephone's local telephone company network?

The Commission also identified a number of subordinate issues associated with these. The proceeding incorporated viewpoints from parties favoring COCOTS - principally potential market entrants - along with Hawaiian Telephone testimony opposing the idea, and recommendations from the Consumer Advocate that the Commission institute a test market program. Those supporting COCOTS claimed that the introduction of competition would expand the total availability of public pay telephones, and would lead to technological innovation. Hawaiian Telephone's position was that it already adequately served public needs, and provided the latest technology; moreover, revenue would be lost if competitors replaced Hawaiian Telephone's high traffic coin telephones, leaving only the low traffic telephones to the company.

As discussed in Chapter 4, the Commission addressed the jurisdictional question first, and determined that COCOTS, if authorized, would in fact represent a public utility subject to its jurisdiction. However, the Commission went on to decide that it would not allow COCOTS competition on the basis of the available evidence, not even on an experimental basis, and thus

there was no need to address the question of rates and regulations to apply to COCOTS. In ruling that COCOTS would not be permitted in Hawaii, the Commission made the following observations, among others:

- Whether the introduction of COCOTS will indeed bring real competition to the local exchange pay telephone service market is open to question. . . . the evidence is unpersuasive that benefits will affect the end user with the introduction of COCOTS.

- [W]e find no evidence to establish that Hawaiian Telephone's coin telephone service is operating inefficiently. Neither is there any evidence which shows that the public needs are not being met by Hawaiian Telephone's coin telephone service and that service quality will be improved with the introduction of COCOTS.

- We recognize that technology is bringing innovations to pay phones but innovations alone cannot justify the introduction of COCOTS.

- Given the uncertain benefits of COCOTS, we do not believe it is in the public interest to affect the present $2.5 million level or even a portion of the contribution to Hawaiian Telephone's revenues which accrue to the benefit of the general ratepayers in the form of lower rates.

- [W]e do not believe that an experimental implementation of COCOTS will provide any meaningful results because there will be a reluctance on the part of prospective COCOTS owners to make those kinds of investments in an uncertain situation. (Hawaii PUC Decision and Order No. 9492, September 22, 1987)

The Commission's rejection of COCOTS for the above reasons was accompanied by further discussion of the conditions under which the Commission would reconsider its position. In particular, the Commission would require "reliable and probative evidence" regarding the intentions of COCOTS owners and the prospective benefits of COCOTS. In addition, the Commission stated it would be amenable to reassessing its decision if there were "a definite showing that Hawaiian Telephone Company has failed in its obligation to serve the public including the placement of coin telephones in low volume public locations."

Markets. Hawaiian Telephone last submitted comprehensive data concerning pay telephone demand and revenues in 1985 in Docket No. 5114, in connection with its request that the coin rate be increased from $0.15 to the present $0.25. At that time, the Company projected that with the rate increase it would earn some $8.0 million in combined annual revenues from public ($7.5 million) and semi-public ($0.5 million) coin telephone services. These amounts were based upon projected totals of some 30 million local public telephone calls, and some 233,000 semi-public calls plus minimum revenue payments from semi-public location owners. There were an estimated 417 semi-public telephones in the State: 310 on Oahu, 62 on Hawaii, 33 on Kauai, and 12 on Maui. Public pay telephones totaled 6024: of these, 4591 were on Oahu, 674 on Maui, 499 on Hawaii, 224 on Kauai, 29 on Molokai, and 7 on Lanai.

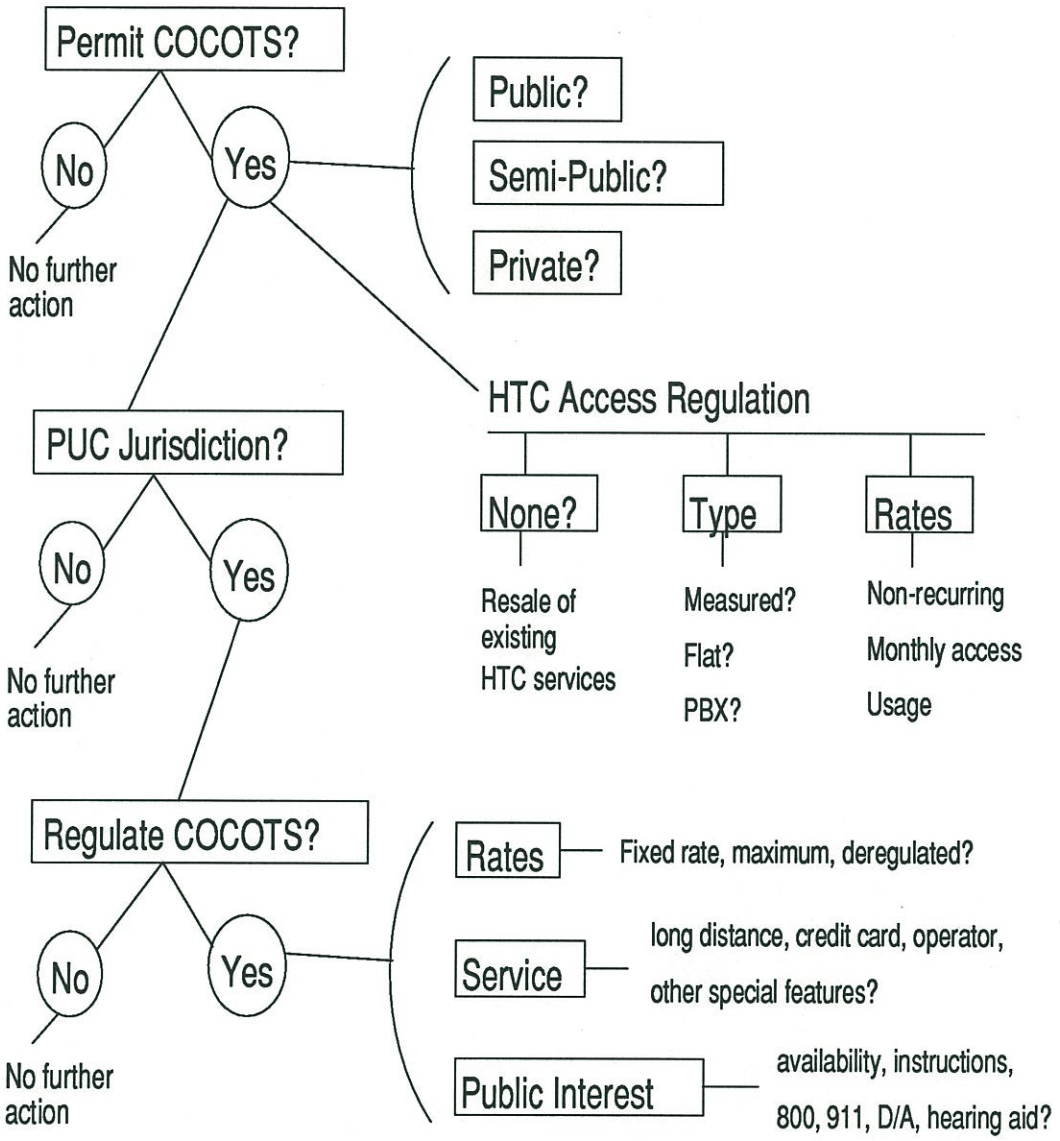
It is thus evident that, for the present, only Oahu would represent a significant market opportunity for COCOTS vendors, and then only if public telephones were included in the pool. Whether COCOTS companies could make significant inroads into Hawaiian Telephone's existing market, if allowed to compete, is an open question. With the abundance of international travelers in Hawaii, there may be a market to incorporate simplified overseas calling as a public telephone feature, in a manner comparable to current long-distance access functions, and perhaps multi-lingual operator services or other marketing concepts as inducements to try new public telephone choices. Also, hotel owners and others serving visitors may have an interest in providing COCOTS in conjunction with Alternative Operator Services (see Chapter 8), for the increased profit opportunities they may present.

Stakeholders. The principal stakeholders in the area of pay telephone competition are the Hawaiian Telephone Company and the customers of its monopoly local telephone services; users of public pay telephones, especially visitors, as well as the establishments that serve them; and the established and prospective participants in the COCOTS industry, many of whom either intervened or obtained participant status in Docket No. 5563. Although Hawaiian Telephone and its customers could confront a risk of lost revenues and thus higher rates, possible economic benefits could be available to store owners, hotels, restaurants, and entrepreneurs that could produce overall benefits to citizens of the State. Other potential beneficiaries could be municipal, state, and federal government authorities, who could realize increased commission revenue as a result of competitive bidding for pay telephone franchises on public property. Since the constituents of these various groups - e.g., telephone subscribers, pay telephone users, taxpayers, business owners, and so forth - undoubtedly overlap, it is not immediately clear which individuals or subgroups might ultimately gain or lose from COCOTS competition.

Policy Options

As the Commission recognized in its previous review of this issue, there are several tiers of policy decisions that can be applied to COCOTS. The threshold question remains whether to permit COCOTS competition at any level or not. If the Commission's previous determination were to remain unchanged, then no further policy decisions would be required. On the other hand, if the State of Hawaii chose to allow COCOTS in some form, there would arise numerous secondary policy issues that would need to be resolved with regard to the newly competitive market. One possibility, of course, would be to allow COCOTS on a deregulated basis. This would minimize the additional policy considerations that would be required, although there would remain the issue of rates and regulations pertaining to Hawaiian Telephone's provision of access services to COCOTS owners. In the absence of deregulation, there would be questions about rates for COCOTS, service quality requirements, and minimum public interest obligations, all or some of which the Legislature and/or the Public Utilities Commission would have to address in some form. Figure 7.1 provides a brief schematic diagram of the hierarchy of policy issues, and the range of options in each area, that arise in the context of pay telephone competition in Hawaii.

Figure 7.1



The key decision points represented by this diagram, and the options they cover, include the following:

- If competitive COCOTS are to be permitted, will only privately owned pay telephones be allowed, or will semi-public (in stores, restaurants, etc.) and/or public pay telephone competition also be introduced?

- What kinds of regulation will apply to the access connections to COCOTS? Minimal or no regulation would allow COCOTS owners to connect their instruments to existing Hawaiian Telephone services, with no special tariff provisions. Otherwise, COCOTS access could be provided on a measured or flat rate basis, over business and/or PBX trunks. The tariffed rates for COCOTS access are likely to include a non-recurring element, a fixed monthly element, and some provision relating to usage, whether measured or flat rate. The precise amounts of these charges must be determined.

- If COCOTS regulation is within the Commission's jurisdiction, and the Commission chooses or is compelled to regulate the industry, what will be the nature of these regulations? There would be at least three categories requiring attention:

    - **Rates.** What rates may COCOTS owners charge? Options include a fixed rate per minute or per call, a maximum rate equal to Hawaiian Telephone's coin rate or some other level, or complete rate deregulation, leaving pricing up to owners.

    - **Service.** Does the State wish to prescribe certain service capabilities that COCOTS providers must offer, such as universal access to all long distance carriers, availability of automatic credit card and operator service access, and other advanced features (e.g., voice messaging)? The State may also wish to require certain minimum maintenance and service quality standards, and periodic reports to confirm that problems are rectified and customers satisfied.

    - **Public Interest.** The State may wish to require certain other services and standards in the public interest. These may include service availability in designated locations, combining the opportunity for high traffic area profits with an obligation to serve certain low traffic areas; clearly written usage and customer assistance instructions, as well as owner identification; free access to 800, 911 emergency, and Directory Assistance; and special features for hearing impaired, handicapped, and foreign language customers.

Analysis

The Public Interest and Pay Telephones. The questions raised in connection with the possible introduction of pay telephone competition in Hawaii concern the interests of Hawaii residents and visitors, and the potential benefits that a competitive market might provide in terms of convenience, accessibility, public safety, and security, as well as entrepreneurial opportunity. To meet these goals, it will be useful to approach the issues with an understanding of the traditional place of pay telephones in the spectrum of telephone services, especially in Hawaii, in addition to the economics and technology of the present industry.

Historically, public pay telephones have frequently been treated as a positive benefit to society, and for this reason, regulatory authorities have often maintained pay telephone charges comparatively low, even when other telephone usage costs have increased. At the same time, this service is not directly analogous to basic monopoly residential local telephone services, which have traditionally merited revenue subsidies from other telephone services such as business services, long distance toll, and "vertical" local service optional features. There is something of a mix of the "luxury" and "necessity" character in the public pay telephone area, which can compel conflicting policy approaches. For example, the District of Columbia Public Service Commission (DCPSC) reasoned in 1984:

> . . . [C]oin telephone service is, in a sense, situated between the [telephone] Company's pure monopoly basic exchange services and its "luxury" vertical services. When a person uses a public telephone, he or she is usually in a situation which offers no realistic alternative . . . We would not, of course, raise the pay telephone rate to $5.00, even if demand repression would sustain the increase, as the person in that no-choice situation would be greatly injured by the increase. . . . [Nevertheless] while pay phones may occasionally represent a temporary necessity, they are more frequently used under conditions - e.g., in airports, restaurants, stores, and other public places - where the caller has consciously situated himself out of reach of alternative means of communication, in full knowledge that he might have need of a telephone. In these cases, the caller demonstrates an implicit willingness to pay the coin rate, even though it might be marginally higher than the cost of staying home and calling from there. (DCPSC Order No. 7954, January, 1984)

This analysis describes the tradeoffs inherent in a coin telephone pricing decision, but the same general reasoning applies to the nature of the service itself, and to many other issues that must arise in considering whether pay telephone competition is desirable, and under what conditions. It is clear that some level of oversight of service rates and quality would be desirable in view of the public interest concerns outlined above, but at the same time there may be room for competitive activity if the result would be service improvement, and the potential for innovation.

Technological Innovations. In analyzing the tradeoffs inherent in a decision concerning COCOTS competition, one must consider the nature of the functional and service options that the new service vendor(s) might propose if the market were opened to competition. The expectation of technological innovations from competitors has been a principal motivation behind many states' acceptance of COCOTS, largely due to publicity concerning developments in the industry, and the observation that local telephone company pay telephones do not seem to have advanced much in the absence of competition. As the number and variety of pay telephone manufacturers and vendors have grown, so have the capabilities of pay telephones themselves. With constantly changing telephone network and microprocessing technology, vendors have entered an accelerating race to offer new features and capabilities to the private pay telephone market. Many of these new concepts would qualify as luxuries for the pay telephone user, and revenue enhancers to the operator, but others are becoming standard features in the new telephone industry environment.

Among the more basic innovations available are certain convenience and special use features that improve the public benefit of pay telephones. These features include the following:

- Instant 911 Emergency access.
- Pre-programmed automatic dialing capabilities that can be assigned to city authorities or information offices.
- Voice-synthesized usage instructions, including multi-lingual options.
- Hearing aid compatible devices, and similar special needs functions.

Beyond these features are other, more exotic developments. One of the most prominent new concepts currently on the market is the so-called "Universal Pay Telephone," which combines traditional access through coin payments with optional Calling Card and standard credit card access. The credit card capability is the newest innovation in the Universal Phone: the caller inserts a typical Visa, Master Card, American Express, or other national credit card into a slot (or through a "swipe" device), and the telephone verifies the validity of the card, and then charges calls from the station to that cardholder's account. The technology necessary to accomplish this function is particularly challenging for small service operators, since it requires either remote or internal verification and data processing capabilities, as well as a complete management and billing system linked to the credit card companies' systems. Nevertheless, the Universal system is quickly becoming the state of the art in public and private pay telephone service, both because it allows the caller more flexibility in using the telephones, and because it permits the operator or owner of the pay telephone to earn additional commission revenues from long distance calls.

In addition to the Universal Phone concept, COCOTS companies frequently offer some of the following special features to the public:

- Bill changers for cash calls, in both $1.00 and $5.00 denominations.
- Visual display of operating instructions, call time, time remaining on coin calls, and other pertinent information on an alpha-numeric LCD screen. These same features can be provided through synthesized voice techniques.
- Voice Messaging capability. This innovation causes a recording to come on the line when the caller receives no answer or a busy signal, and instructs the caller that he may leave a message if desired. Once the message is recorded at a remote processing center, the system periodically attempts to reach the called number at set intervals, and when a connection is made, it plays the recorded message to the receiving party.
- Alternative Operator Service options (see Chapter 8), providing callers with the ability to reach live operators affiliated with the pay telephone system or long distance carrier, regardless of the carrier selected to connect a given call.
- Remote system management capabilities, which allow the system operator to monitor telephone usage, update internal rate tables, detect malfunctions, compile revenue histories, and track collection schedules, all from a central management office, using specialized computer software.

Ratepayer Protection. If indeed the introduction of pay telephone competition would facilitate improvements in service along the lines of the above features, the policy question is reduced to whether there would be associated costs that would outweigh these benefits. Competition would not realistically increase the availability of pay telephones in places that are currently underserved, since those locations are undoubtedly low revenue, high cost locations that would be unattractive to new entrants and are currently subsidized by Hawaiian Telephone's more profitable stations. Thus any displacement of Hawaiian Telephone's pay telephones would generally occur where the revenue contribution (profit) is highest, and the result would be a reduction in subsidies to other public telephones, including most of those on islands other than Oahu. Hawaiian Telephone would then have to choose between increasing other service rates to make up for the lost contribution, or removing the least profitable pay telephones. Obviously, it would be incongruous with a policy of promoting development on the outer islands to institute a program that led to a reduction of the already small number of public telephones available on those islands.

Nevertheless, there is a perception that COCOTS is somewhat inevitable, given the pattern of decisions in most other states and the growth of the industry nationwide. It is worth noting in this respect that even the Hawaii Commission's present policies with respect to COCOTS apply only to pay telephones used for calling within Hawaii, whether local or between islands. As such, the prohibition on competitive systems necessarily prevents private ownership of pay telephones that could be used for *both* in-state and out of state calling. However, the Commission would not have jurisdiction to place a similar restriction upon the implementation of pay telephone service for the *sole* purpose of providing calls between Hawaii and the mainland, or international calls. Thus in effect COCOTS operators could institute service on the islands for these non-local markets only, establishing a market presence that would position them strategically for local service entry if permitted. In light of these conditions, the State may wish to consider policies that permit COCOTS while minimizing contribution losses and assuring service quality standards, rather than endeavor to resist perpetually any COCOTS presence.

Along these lines, the most common approach in other states has been to implement access tariff rates for COCOTS that seek to recover from COCOTS owners directly the bulk of any potential diverted revenues, by means of usage related rates. Although many states accomplish this through local measured service access rate structures, it should be possible to design a tariff structure that approximates usage under a flat monthly COCOTS access rate, without incurring the costs and other disadvantages associated with measured service. Of course, the higher the COCOTS access rate (i.e., the more completely it recovers lost Hawaiian Telephone pay telephone revenues), the less incentive there will be for COCOTS suppliers to enter the market. They might not avoid Hawaii altogether, however, even if the access rate is quite high relative to likely local coin telephone profits, because there will remain the opportunity for profits from long distance, overseas, and operator assisted calling. Although exclusively non-local pay telephones could achieve these profits without paying the COCOTS access rate, COCOTS companies might choose to offer full local and off-island services as an incentive to encourage premises owners to choose their service over other competitors. It is the nature of a competitive market that the provider offering the most attractive and lucrative alternative will excel in the marketplace. By permitting local COCOTS with contribution-preserving access charges, Hawaii could promote such a competitive market without seriously risking monopoly revenues or ratepayer interests.

Notes

1. There appears to be no universally adopted terminology or acronym in this area. Among the most common usage are "COCOTS" for Customer Owned Coin (or Currency) Operated Telephone System, "PATS" for Pay Telephone System, and "COPTS" for Customer Owned Pay Telephone System, as well as "public" and "semi-public" telephones, and simply "coin" or "pay" telephones.

Chapter 8

Alternative Operator Services

The Alternative Operator Services industry is quite new, and has stirred considerable controversy. Competing operator companies have been criticized for charging exorbitant rates and for not properly identifying themselves or allowing adequate access to local and long distance company services. Hawaii can only directly control in-state activities of such companies, but can influence their interstate and international operation through regulation of, among other things, the billing and collection services that could be provided to operator companies by Hawaiian Telephone.

Issue Summary

Alternative Operator Services (AOS) companies are telecommunications resellers that provide operator services to hotels, motels, hospitals, airports, Customer Owned Coin Operated Telephone Systems (COCOTS), universities and other institutions with a high volume of operator-assisted calls. The AOS company pays a commission to the institution for the right to handle its operator-assisted calls, and arranges for local telephone companies to provide billing and collection services. Two developments created a market niche for the birth of the AOS industry. In 1983, AT&T discontinued its practice of paying hotels a commission on calls made using an operator (sometimes called "0+" calls) to reimburse them for the cost of making telephone service available to all of their guests. The following year, the Federal Communications Commission (FCC) authorized competition in the pay telephone industry and allowed hotels and similar institutions to resell local and long distance service and to add surcharges to their guests' telephone bills. AOS companies seized this opportunity to offer operator services to the hospitality industry on a commission basis.

A few of the more than thirty AOS providers in business today own operator and switching centers and control their own network facilities; some others just hire operators, but must contract with another company to connect calls. In addition, some AOS providers route their calls to a distant operator center via a toll-free 800 line purchased from a long distance company (which increases the time required to complete the call and the transmission cost of the call). These technical considerations combined with the practice of paying commissions to institutions (motels, hospitals, etc.) and making a sizable profit in the process, have resulted in operator service *rates* that are considerably in excess of the normal tariff charges imposed by traditional long distance telephone companies such as AT&T. Consumers are typically unaware of these high rates until they are billed for their usage after the fact; most consumers are not aware of the presence of AOS companies, and there has not been any concerted effort to inform the public about the industry and the nature of its services. Some callers have even complained that when they have used their AT&T calling card number from a hotel or similar location, an AOS provider handled the call instead of AT&T.

The issue of connectivity is key to the AOS controversy. From the transient caller's point of view, AOS companies (while considered "competitive" by the FCC) are in effect local (and unregulated) monopolies, since in many cases the AOS company will only connect the caller to a specific long distance company. The only option for a caller who does not want to use the AOS

service available through the institution from which he is calling is to find another telephone; this is particularly difficult for hospital patients, and is cumbersome for hotel guests and others. Even if the AOS operator is willing to connect the caller to another long distance company, it sometimes tries to dissuade the caller from exercising this option. The competition that does exist in the AOS industry is available only to the institution that is in a position to contract with the operator service company it chooses. Because of the transient nature of individuals placing calls at hotels, motels, and private pay phones, caller dissatisfaction with the operator service has little or no short term effect on the institution or on its choice of AOS contractor.

During the past year, widespread and frequent consumer complaints have led to unfavorable publicity for Alternative Operator Services and pressure on regulators to clamp down on this newly "competitive" segment of the telecommunications industry. Consumers report being subjected to excessive rates, mis-routed emergency calls, charges for uncompleted calls, bills from unknown companies, and the inability to reach the long distance company of their choice. In response to these consumer outcries, many state utility commissions have resorted to regulation to protect the individual making the call, while the FCC has generally avoided regulation of operator service providers altogether, on the theory that competition will ultimately foster the development of innovative services of benefit to consumers.

Approaches Elsewhere

The National Association of Regulatory Utility Commissioners (NARUC) conducted a national survey on Alternative Operator Services in early 1988 and issued a report on the findings in July. From the pool of survey respondents comprised of all state regulatory agencies, 84% indicated that they had received customer comments/complaints pertaining to AOS providers. As a result of the survey NARUC proposed a resolution containing national regulatory guidelines for AOS providers. These guidelines proposed regulation of AOS providers' rate levels to guard against unfair pricing, and the regulation of emergency call procedures to assure that these calls are routed in the quickest way possible to the local network. In addition, the NARUC task force recommended that AOS providers be required to quote their rates upon request, post a notice identifying the call provider and the customer complaint procedure, and meet established industry guidelines for call completion, operator response time, and the minimum technical standards for interconnection and transmission quality. The resolution also recommended that AOS firms be required to demonstrate that the services they propose are in the public interest and that a need exists for the services.

In marked contrast with regulatory activity in numerous states and the recommendations of NARUC, the FCC seems hesitant to regulate AOS providers. At the request of the House Energy and Commerce Committee Chairman, John Dingell (D-Mich), and in response to numerous complaints, the FCC agreed to conduct an inquiry on AOS. To this end, the FCC sent letters to seven AOS providers asking how they do business, and issued a consumer bulletin encouraging callers to ask how their long distance service will be provided when they use a pay phone or call from a hotel, hospital, or other transient location. The FCC indicated upon completion of the inquiry that it would continue to educate consumers about AOS and meet informally with AOS companies to resolve consumer problems. FCC chairman Dennis R. Patrick stated that he sees AOS companies

as potential sources of innovative operator services which should not be eliminated through regulation. The FCC came under attack by national consumer groups, which have asserted that the FCC should take a harder line with AOS companies, whose services the groups believe violate the requirement in the Communications Act of 1934 that rates must be "just and reasonable".

Among the state responses to Alternative Operator Services have been outright prohibitions on AOS for intrastate calling, certification requirements, rate caps, public information campaigns and warnings, and various restrictions on operator access. Following are some specific examples of state actions:

California: The California Public Utilities Commission issued a consumer warning on AOS companies. The Commission instructed consumers to ask the operator or the management of the hotel, motel, airport, hospital or other facility which telephone company he or she works for and what the rate for the call will be. The Commission ordered AOS providers to apply for reseller certification and submit proposed tariffs for intrastate operator-assisted calls. In order to resell intrastate interLATA (Local Access and Transport Areas) long distance service via a pay telephone, AOS firms must observe a rate price cap matching the AT&T operator-assisted rate plus no more than ten cents.

Florida: In March of this year, the Florida Public Service Commission ruled that AOS companies must route all "0+" intraLATA traffic to the local telephone company, along with all direct calls to operators. AOS companies will be permitted to charge what they want for calls within the state but between LATAs; however, the difference between their rates and the highest tariffed rate for a Southern Bell operator-assisted call is subject to refund. A rate cap on calls made at pay telephones was set so that the AOS rates could not exceed the daytime rates set by AT&T plus $1.00. In addition, private pay telephone owners must permit access to a local telephone company operator by dialing "0". Certification, which was previously optional, became mandatory for AOS providers.

Idaho: The Idaho Public Utilities Commission issued an order on August 30,1988 introducing the following regulations: AOS providers must file informational tariffs including rates and charges with the Commission, identify themselves before completing a call, quote their rates upon request, and charge only for completed calls. Telephones using AOS must be labeled with, or be located near, the name and telephone number of the AOS provider, the procedures for reporting service problems and making billing inquiries, and dialing instructions for reaching the local telephone company operator. Private pay telephones must have emergency dialing procedures posted and must be set up to route calls to the local telephone company operator when "0" is the first digit dialed unless exempted by the Commission. AOS may be accessed through any other dialed code or symbol. Local telephone service cannot be disconnected for nonpayment of an AOS charge and bills for AOS services must contain the following statement: "The rates for these services are not regulated by the Idaho Public Utilities Commission."

New Jersey: In mid-1988, the New Jersey Board of Public Utilities issued an order allowing AOS companies to complete operator-assisted calls between LATAs within the state over their own networks. Calls within LATAs, on the other hand, must be completed via the resale of local telephone company services. The Board ruled that private pay telephones must reach a local telephone

company operator by dialing "0" and telephones in institutions with high operator-service demand must provide the same access to a local company operator by dialing "0" once an outside line connection is obtained. Callers may access AOS operators via any other designated telephone key or symbol. This will ensure that customers reaching an AOS company are doing so by choice rather than by default and that all emergency calls are routed directly to local telephone company operators. Telephone companies that provide billing and collection services for AOS companies are required to include a statement on the AOS portion of the bill explaining that the local telephone company and the AOS company are not affiliated and that AOS charges are not regulated by the Board.

Conditions in Hawaii

Policies. The issue of Alternative Operator Services has not to date caused controversy in Hawaii, in part due to the prohibitions on COCOTS and Customer Premises Communications Systems, and to the relatively small level of interisland calling versus local calling. To our knowledge, no independent operator services companies operate in the state in connection with either local or long distance calling. Nevertheless there are certainly many types of establishments in Hawaii, such as hotels, hospitals, and other public institutions, which might serve as a lucrative market for AOS companies seeking to provide services to the mainland U.S. or internationally. AOS companies serving callers to these locations would not be subject to direct state regulation, but their operations could be partly overseen through certification requirements and regulations governing billing and collection services provided by Hawaiian Telephone Company. The Hawaii Public Utilities Commission has not yet taken any action in this area.

Present operator services surcharges above standard rates in Hawaii are listed below. The local public pay telephone surcharges apply in addition to the $0.25 charge per local call. Long distance rates incorporate a minimum three minute initial period charge. The long distance surcharge is the difference between the charge for the first three minutes of a long distance direct dial call and the operator assisted charge.

Table 8.1 Hawaiian Telephone Operator Assisted Rates

Service	Charge
Local Public Telephone Credit Card Billing	$1.05
Local Public Telephone Third Number/Collect	$1.55
Long Distance Station-to-Station	$0.74
Long Distance Person-to-Person	$1.79

Markets. The principal market opportunity for AOS companies in Hawaii would not be in-state operator-assisted calls, but mainland U.S. and overseas calls, for which rates are already fairly high, and for which operator surcharges could be considerable. Hawaiian Telephone does

not earn a substantial amount of revenue from operator services within Hawaii. In Docket No. 5114 in 1985, the Company provided estimates of in-state operator-assisted long distance traffic that showed that about 2.5 million interisland calls per year involve operator services (or calling cards), about 17% of the nearly 15 million total interisland calls. The extra revenue attributable to the operator service element of these calls is approximately $7.5 million per year. It is unclear how much additional revenue from such services is earned by hotels and similar establishments that effectively resell long distance service to captive customers, and that would be the prime candidates for AOS companies. Hotels are reluctant to reveal their telephone surcharge rates and policies.

Stakeholders. The stakeholders in any introduction of AOS in Hawaii would include consumers and visitors, establishments that might wish to contract with AOS companies, and of course the potential service vendors themselves. Hawaiian Telephone Company and its ratepayers would not stand to be directly affected by AOS, except to the extent ratepayers make use of the public telephones that would be connected with AOS systems. Hawaiian Telephone itself would not stand to lose significant revenue from the presence of AOS, since these services typically replace *long distance* company operator services, and revenues that would have been paid to those long distance companies. To the extent, however, that AOS might occasionally replace Hawaiian Telephone operator functions, for example for interisland calling or local collect and third party billing, Hawaiian Telephone might realize some small level of revenue losses if the service were introduced. Aside from AOS companies, the stakeholders standing to gain the most from competitive entry in this area would be hotels and other establishments concentrating on the visitor industry. Through revenue sharing arrangements, it can be expected that these businesses could realize substantial additional profits under AOS arrangements. If COCOTS competition were to be permitted, owners of private pay telephones could also contract with AOS companies, to their mutual benefit.

Policy Options

If the state wishes to avoid the possibility of Alternative Operator Services becoming a consumer problem as has arisen elsewhere, there are a few options for policies regarding the in-state activities of AOS companies that could be implemented, along the lines of other state rulings. It is important to recognize, however, that most regulations dealing with AOS activities on an interstate or international basis are beyond the control of the Hawaii Public Utilities Commission or the State Legislature, and can only be addressed at the federal level. State policy options include the following:

- Prohibit the operation of Alternative Operator Services companies in the provision of operator services within the state, both local and long distance.
- Permit AOS competition, but require certification of AOS companies.
- Establish rate ceilings or specific rates for AOS service within Hawaii.
- Require routing of all "0" dialing from public pay telephones to Hawaiian Telephone Company operators, but allow AOS companies to be accessed through other dialing procedures.

- Require posting of AOS company identification, rates, customer service procedures, and instructions for dialing a Hawaiian Telephone operator at all telephone locations where AOS services are used.

- Require that all AOS companies using Hawaiian Telephone billing and collection services, including those that provide mainland and international service, meet any or all of the above requirements.

- Conduct a public information campaign to inform consumers and visitors about the nature of AOS services, and the options available to them.

Analysis

In 1984, when the FCC authorized competition in operator services, the national monopoly that AT&T had previously enjoyed was eliminated. The result was that the single national AT&T monopoly was replaced by a multitude of *local monopolies* whose respective source of monopoly power is derived from their control of the *real estate* within which a telephone instrument is located (hotels, hospitals, etc.). The FCC's pro-competition policy did not create any additional choices for the consumer of operator services. The "competition" among the various AOS companies is directed not at keeping prices down or offering innovative services and features, it is primarily driven by the commissions offered to owners of establishments with high transient telephone usage. Rather than foster lower prices, that kind of "competition" only serves to increase the fees that captive users of these services are required to pay. As a result of the transition from a national monopoly to multiple local monopolies, the FCC replaced the monopoly that could be efficiently regulated with one that could not.

The image and practices of the AOS industry may be changing. Faced with increasing regulatory attention and a pervasively negative image, several AOS providers joined together in April 1988 to form a trade association called Operator Service Providers of America. More than twenty companies (approximately two-thirds of the total number in existence) have joined the association, which has several objectives. Members adopted a code of responsibility which states that they will "identify themselves to the public, provide pricing and billing information, provide high-quality service at competitive rates, and respond rapidly to consumer inquiries." In addition, the code emphasizes that AOS providers should "work cooperatively with regulatory agencies" and try to "increase public awareness of the benefits afforded by a competitive operator services industry." In the past, AOS companies have aimed their advertising at customers such as hotels and motels through trade publications, but they will now attempt to reach the actual callers through bill inserts explaining who they are and the service they provide. When questioned about rates that remain high, the trade group stated that it will take a few months for progress to become evident because of the long billing process (60 to 90 days) for operator-assisted calls.

Despite these positive developments, it is not clear at this time that the introduction of Alternative Operator Services in Hawaii would be in the public interest. This industry is not, in an economic sense, a manifestation of competition for local or long distance telephone services, and as such its prospects for improving service, reducing costs, and encouraging innovation are questionable for the present. Although market forces may eventually shape the AOS industry so that it

is acceptable to consumers and to the hospitality industry, this will take time, and in the interim it is apparent that, to the extent the State is willing to permit entry into this industry, regulation of AOS may be needed to protect consumers from unfair rate and billing practices. As a practical matter, the State can forbid AOS companies from providing in-state calling services only, and can exercise only limited influence over the interstate and international operations of AOS companies that seek to function in Hawaii. The principal mechanism for accomplishing this would be to place restrictions on AOS companies' use of Hawaiian Telephone billing and collection services unless they adhere to certain rules of practice. These same basic rules could be directly applied to AOS companies wishing to provide in-state service in Hawaii.

Since an efficient market depends on adequate information, one of the principal tasks of regulation should be to alert consumers to AOS companies, their rates, and their practices. To make an economically efficient purchasing decision, callers must have this information *before* making their calls. Hawaii may decide, as have other states, to require AOS companies to post a notice at every location identifying themselves, explaining how to register a complaint concerning their service, and indicating how to access emergency telephone service. The disclosure of such information, including rates, could be made mandatory for hotels and the like as well, even if they provide service through Hawaiian Telephone only. Further regulatory action, focusing on preserving existing routing of "0" traffic to Hawaiian Telephone, and mandating maximum rates for AOS, would also help to protect consumers in the event that AOS service should be authorized in Hawaii.

The future of the AOS industry is unclear. Regulation on the part of states such as Hawaii without similar action on the federal level will probably not succeed in providing comprehensive consumer protection. Certainly state regulation will cut into AOS providers' profits, but the opportunity to install AOS facilities that intercept only interstate calls will continue to provide a market incentive to the industry even where in-state service is prohibited outright. In this case, the AOS provider would simply have to contract with more client hotels and the like in order to cover service costs. While regulation may be required to protect consumers and preserve their rights to choose a long distance company, the potential may nevertheless exist in the long run for AOS companies to offer innovative services such as voice-messaging on a competitive basis. Independent AOS companies could offer such services with no affiliation to a hotel or similar institution, and the consumer would be free to compare the services and rates of several AOS providers and choose among them. To the extent that true competition in the area of innovative services represents a legitimate future opportunity for AOS companies which would not be at the expense of the consumer, but rather a benefit to the industry as a whole, it is worth keeping open the prospect of encouraging AOS growth in Hawaii. The short term imperative, however, weighs in favor of protecting, to the extent possible, the consumers of Hawaii from monopolistic abuses that carry no identifiable benefit.

Chapter 9

Interisland Service

Current rates for service between islands in Hawaii are maintained high for the purpose of generating a subsidy to support other Hawaiian Telephone services. In spite of these above-cost rates, there appears to be little opportunity for significant competition in the interisland services market, due to technological and geographic limitations and the relatively modest level of demand for such services. Reductions in Hawaiian Telephone's interisland rates, however, could stimulate telecommunications usage between islands, and contribute to economic development on the neighboring islands.

Issue Summary

The opportunities for alternatives to Hawaiian Telephone's service between islands are currently very limited. In addition, the existing rates for this service and the cost and availability of alternative transmission facilities may not be conducive to competitive entry, except on a specialized basis. However, there may be policy approaches that would encourage competition, perhaps through resale of service, that would improve economic efficiency, foster economic development, and provide customers with less expensive options for calling between islands. The major issues can be divided into two categories: Hawaiian Telephone's rate structure and the potential for competitive entry in the market. Hawaiian Telephone's present rate structure is modeled on AT&T's late 1979 tariffs and generates a substantial subsidy for other Hawaiian Telephone services. The potential for competitive entry may be limited by geographic barriers and lack of available microwave spectrum.

Approaches Elsewhere

In one sense, it is obvious that the issues associated with interisland service competition will not find any precedent in other states, with the exception of a handful of coastal locations (for example, Maine, Massachusetts, Washington, Florida) where telephone services are provided to islands. Realistically, Hawaii is the only state where the unique geographical impediments of interisland waterways, not to mention weather and other conditions, affect a large volume of in-state traffic demand. On this level, therefore, the lessons to be learned from competitive policies in other states will be limited.

Nevertheless, a more general review of in-state competition at least may provide some background into the nature of economic and technical tradeoffs involved in analyzing the interisland issue, subject to the specific limitations that the islands' geography imposes. Appendix B shows the extent to which long distance competition within states is permitted and regulated. This information demonstrates that variations in size and geography, as well as regulatory philosophy, have produced a wide array of approaches to in-state competition for long distance (or "interexchange") services.

The fundamental theory underlying the divestiture of AT&T was that competitive telecommunications markets could develop along certain geographically defined interexchange routes, whereas competitive conditions would be less likely to exist within concentrated local service areas. The *Modification of Final Judgment* that governed the AT&T divestiture established Local Access and Transport Areas (LATAs) in all the regions served by the former Bell system, and mandated that AT&T and other long distance telephone companies could carry traffic *between* these areas, while the divested Bell Operating Companies (the local telephone companies) could only provide service *within* LATAs. Thus, those states that are divided into multiple LATAs (all but 12 states) generally allow *interLATA* competition as a result of the *Modification of Final Judgment* and the AT&T divestiture. Several states, however, have recently begun examining whether in fact some level of competition *within* LATAs should be allowed, even though this was not a part of the original divestiture settlement *per se*. It is unclear, however, whether this intraLATA competition will survive or prosper, in view of the structural economic advantages that local telephone companies have within their service areas over any competing telephone companies.

The case of Hawaii can be compared in some ways to both interLATA and intraLATA competition. The LATA system is based upon both geographic and demographic factors that tend to determine where the strongest communities of interest lie within and between various states. Thus most LATAs are organized around one or a few large population centers, closely situated, whose telecommunications traffic could be most efficiently served by a single integrated telephone company. Each of the Hawaiian Islands in this sense could be thought of as a LATA, especially since the barriers *between* islands effectively prohibit true network integration other than on each island separately. If a different telephone company served each of the islands, their local telephone networks would be no less efficient than Hawaiian Telephone's present systems on each island.

In another sense, however, Hawaii more closely resembles - and by definition is - a single-LATA state. Because the population of the State is overwhelmingly centered on Oahu, service between islands is analogous to service between cities and towns within a mainland LATA, where the bulk of the population lives in the cities, and rural areas lie in between. The economics of serving this type of market tend to favor monopoly service, as evidenced by the fact that the single-LATA states, and many LATAs in larger states, fit the same pattern. Appendix C includes a LATA map of the United States, and several representative state LATA maps. States with large areas but low populations in many cases consist of only one LATA, despite having widely separated population centers. In South Dakota, for example, over 400 miles separates Rapid City from Sioux Falls, but they are in the same LATA. Maine is a single LATA, despite the distances between Portland, Augusta, and Bangor. States that are divided into numerous LATAs, such as Illinois, New York, and several other Eastern states, have fewer rural areas, and relatively high population density across greater proportions of their territory.

It is these states with higher population densities that, in general, have been more inclined to institute and support intraLATA competition. With the exception of California, virtually all of the states that do not permit competition within LATAs are relatively sparsely populated. In fact, however, there is little evidence yet that even where intraLATA competition is openly allowed and unrestricted, it will grow to capture a significant market share from the dominant local telephone company. Most such "competition" to date has been in the form of *resale* of local telephone company services, a practice which is not necessarily economically efficient, and which in any event does

not constitute true economic competition. Even at the interLATA level, in-state competition has been limited in most states, and the historic dominant long distance company, AT&T, retains the vast majority of the market in spite of several years of unrestricted entry and competitive opportunities. On the national (interstate) level, where non-dominant long distance telephone companies such as MCI and US Sprint have gained the majority of their traffic, AT&T still retains by far the largest share of the market, at least 70% by most measures. It is evident, therefore, that even in the most favorable markets, long distance competition has its limitations. In smaller markets with geographic and demographic barriers, competition has not yet proven to be viable in the long term.

Conditions in Hawaii

As noted above, there are two primary issues to be addressed in examining state policy with respect to calling between islands. The first is whether Hawaiian Telephone's *rate structure* for services that are furnished between the islands is appropriate. The second is whether or not *competition in transmission services* between the islands is feasible and/or desirable. The present Hawaii Public Utilities Commission regulatory policies and Hawaiian Telephone rate structure for telecommunications services between the islands act to limit both the use of these services and the availability of alternatives.

Rate Structure. The Hawaii Public Utilities Commission most recently reviewed the rate structure for switched services (i.e., Message Telephone Service and wide area telephone service (WATS) between islands as part of a general review of Hawaiian Telephone's service charges. This Docket No. 3423 was initiated in the late 1970s and had several phases, one of which was devoted to interisland Message Telephone Service and WATS service within Hawaii. In this proceeding, Hawaiian Telephone proposed, and the Hawaii Public Utilities Commission agreed, to restructure rates for these services to pattern Hawaiian Telephone's rate structure after the AT&T rate structure that was then in effect. Changes that occurred as a result of this proposal included standardization of the times for evening and night discounts and the initial calling periods, and the introduction of a rate differential for operator assisted calls. Hawaiian Telephone also proposed that there be only one rate for calls between islands, regardless of the distance involved, and selected that rate to be equal to that which would apply for calls between points in different states on the mainland U.S. that were about 140 miles apart, the average transmission distance for a call between islands. Hawaiian Telephone's WATS proposals included changes to the rate periods and rate levels, elimination of a flat rate option, and the addition of inward WATS (also known as "800 Service"). As with the Message Telephone Service rate structure, the WATS rate structure was modeled after AT&T's charges for similar services.

Hawaiian Telephone's rate structure and its rate levels for Message Telephone Service and WATS have remained virtually unchanged since this major restructuring of rates. AT&T's rates and its rate structure, and the rates and rate structures for interstate long distance services generally, have undergone substantial changes since the conclusion of Hawaiian Telephone's rate restructuring. These changes have significantly affected customers' perceptions of service between islands. The major change has been the substantial reduction in rates for AT&T's Message Telephone Service that has occurred since the 1984 divestiture of AT&T's operating companies and the Federal Communications Commission's introduction of access charges. As a result of AT&T's rate changes, Hawaiian Telephone's rates, and to some extent its rate structure, are now

quite inconsistent with charges that customers see for other services. For example, there is a perception -- which is correct at some times of the day -- that it costs more to call Lahaina from Honolulu than it does to call San Francisco or New York.

Moreover, rates for calls between islands are high not just in comparison to present rates for service to the mainland U.S. They are also high when compared to the cost to Hawaiian Telephone of furnishing that service. Hawaiian Telephone, like other local telephone companies, has traditionally used Message Telephone Service and WATS as sources of subsidy for local residential rates. This rate structure policy came about as a means to promote universal service, a goal that has been the subject of long standing federal and state public policy. Because Hawaiian Telephone has relied on revenues from long distance service to subsidize its local telephone service, Hawaiian Telephone now is in a position of being unable to reduce rates for service between islands without considering how and where it can make up the lost subsidy that was provided by this service. Much, although not all, of the $50-million annual subsidy to residential service comes from interisland switched services revenues.

Nevertheless, the simple solution to replacement of lost subsidy -- to raise residential rates -- may not be either the only solution or the best solution. Nor is it clear that raising rates for residential service will necessarily abrogate the universal service goal. Moreover, the present policy of high rates for calls between islands and relatively low rates for residential service has additional impacts on residents, both as to telecommunications services and for areas outside of telecommunications.

While Hawaiian Telephone's rate structure affects all customers in Hawaii by providing financial disincentives in calling other islands, it may have a more significant impact on economic development on the neighbor islands than it does on Oahu and in Honolulu specifically. Clearly, the economic base for the state is presently on Oahu and is likely to remain there for the foreseeable future. Thus, to the extent that a business on a neighbor island has any activities within the State, for example, even meeting its needs for office supplies, it is likely that it will be necessary to communicate with others on Oahu. The high rates for service between islands substantially detracts from the economic attractiveness of locating on a neighbor island and could seriously impair ongoing efforts on Kauai, Maui, and the Big Island to foster new business ventures.

Competition. The Hawaii Public Utilities Commission has concluded that its jurisdiction over alternative telecommunications service providers is fairly substantial. The Commission must determine that such services are in the public interest, and it maintains the responsibility to ensure that the terms and conditions under which such services are offered are just and reasonable. At present, there has been only one request by a firm to furnish an alternative to Hawaiian Telephone's transmission service between islands. That request, which was approved by the Hawaii Public Utilities Commission, was from a firm named Tel-Net, which planned to offer high speed, digital data service using digital microwave facilities. There have apparently been no requests by firms to enter the market for resale of either switched or dedicated services between the islands. Since Tel-Net presently provides specialized services to a small number of customers, Hawaiian Telephone furnishes virtually all telecommunications service between islands.

The Hawaii Public Utilities Commission authorized Tel-Net to furnish high speed, digital data service over dedicated facilities in 1986. Tel-Net has constructed a "backbone" digital network across the State that utilizes microwave facilities.[1] In its application for operating authority, Tel-Net contended that it planned to furnish a service that was not, at that time, available from Hawaiian Telephone, namely, high speed digital data transmission service over microwave, rather than land-based, facilities. Although Hawaiian Telephone countered that it was ready, willing, and able to offer the same service, the Hawaii Public Utilities Commission concluded that Hawaiian Telephone was not already offering such service and consumers would benefit from the addition of Tel-Net's microwave offering.

Since entering into competition with Hawaiian Telephone, Tel-Net has experienced some difficulties associated with Hawaiian Telephone's position as the overwhelmingly dominant telephone company serving the islands. Tel-Net seems to have been disadvantaged in its attempts to compete by Hawaiian Telephone's manipulation of its private line rate structure in particular markets. In an incident that is the subject of a complaint to the Hawaii Public Utilities Commission, Hawaiian Telephone reclassified a route on the Big Island. The route was one where Tel-Net planned to offer service to a specific customer for about $300 per month per circuit, a price that was substantially lower than Hawaiian Telephone's tariffed rate. Hawaiian Telephone's tariffed rate for the route (Hilo to Kona) was included in the rate category for routes that began and ended on the same island. Hawaiian Telephone reclassified the route so that it was priced as if it were a route between islands, a change that had the effect of reducing the total price for a circuit on that route from approximately $900 per month to just over $100 per month.[2] In filing the changed tariff pages with the Hawaii Public Utilities Commission, Hawaiian Telephone apparently did not advise the Commission that the reclassification of this route would have a substantial rate effect. Nor did Hawaiian Telephone propose reclassifying any other routes which may have had similar geographic and/or cost characteristics. In short, the incident gives the appearance that the dominant telephone company quietly changed a particular rate in an effort to prevent a competitor from encroaching upon its business. The incident is noted here because it highlights the power of an incumbent local telephone company even where there is oversight by a regulatory body.

As noted above, Tel-Net is the only firm that has attempted to obtain permission to install alternative facilities to furnish telecommunications transmission services between islands. Aside from the regulatory and competitive difficulties that Tel-Net has faced, which would be shared by others who entered the market, it is likely that other potential competitors face insurmountable physical barriers to entry into this market. Based upon presently available technology, there are two reasonable alternatives for transmissions between islands -- microwave facilities and fiber optic cable -- each of which presents different problems for use between islands.[3]

There are no technological barriers to installation of fiber optic cable between the islands; however, the State's geography would make it a relatively expensive venture. The channels between the islands, particularly between Maui and the Big Island and between Oahu and Molokai, are very deep and the currents are quite strong. Thus, installation would be costly even though the cost of fiber optic cable has been declining dramatically over the last several years. In addition, even though the large capacity of fiber optic cables means that a potential developer could recover the relatively high fixed costs from many customers rather than from just a few, it is not clear that sufficient

additional traffic could be generated to justify the installation of such high capacity facilities.[4] In any event, given the present volume of traffic between islands, it seems unlikely that a fiber link between islands will be constructed in the near term.

The barriers to additional microwave facilities are quite different. Microwave is a cost effective transmission medium between islands. The problem is that there are severe limitations on the spectrum (i.e., the microwave radio frequencies) suitable for use between islands, in part because of the distance a microwave signal must travel without the opportunity for use of repeaters (devices to strengthen the signal). Frequencies in the 2-gigaHertz and 6-gigaHertz range are necessary for digital transmissions over these distances.[5] The Federal Communications Commission is responsible for assigning microwave frequencies to users and for ensuring that each installation is sited so as not to interfere with other microwave operations. It has been reported that no additional frequencies in these ranges, other than those already held by Hawaiian Telephone and Tel-Net or allocated for other purposes, can be assigned for use between the islands.[6] That would preclude any additional companies from using microwave facilities to compete with Hawaiian Telephone and Tel-Net to carry interisland traffic.

One last factor with respect to competition should be considered. As noted above, there are no firms that resell Hawaiian Telephone's interisland service. It also does not appear that the Hawaii Public Utilities Commission has received any requests to enter the resale business. When there are no firms offering a particular type of service, it is difficult to determine the factors that have deterred firms from entering the market since there are no obvious sources of information or any analyses that may have been performed. That is the case with the resale market in Hawaii. It is possible to speculate, however, that the existing Hawaiian Telephone rate structure is not conducive to resale efforts. In order for a reseller to be successful, he must be able to purchase the necessary service at a "wholesale" price that allows some margin for the reseller's operating expenses. When resale of interstate long distance began, firms were able to purchase WATS service on a wholesale basis at a price that allowed sufficient margin for resale. Hawaiian Telephone's WATS rates do not offer that potential margin. In addition, Hawaiian Telephone has no bulk, or wholesale, rates for dedicated services between the islands. Thus, a potential reseller who analyzed the market in Hawaii would undoubtedly conclude that there was not a viable business opportunity there.

Policy Options

There are policy options that correspond with the two categories of issues discussed above. First, regardless of whether there appears to be potential for the introduction of competitive facilities-based long distance telephone companies in this market, it is reasonable to question whether Hawaiian Telephone's rate structure for services between islands should be modified. The present rate structure requires customers using Hawaiian Telephone's service between islands to provide a substantial contribution, primarily to local telephone service. There are related issues that accompany an examination of the rate structure for service between islands. These include the appropriate level of contribution for residential local telephone service, the identification of other services that do or might generate contribution, and the incentives and disincentives to economic development on the neighbor islands that are associated with particular rate structures. Thus, examination of restructuring rates for service between islands would be best done during a general examination of Hawaiian Telephone's rates.

Second, the State should examine whether there are policies which would either enhance or impair whatever limited potential there may be for development of alternative interisland facilities or services. The nature and extent of regulation of both Hawaiian Telephone and potential alternative providers will impact development opportunities. If alternative long distance telephone companies are prohibited from operating, development of alternatives would be absolutely foreclosed. The same policy decisions can be made with respect to resellers. Resellers could be absolutely prohibited from offering telecommunications services between islands. If both facilities-based and resale of interisland services is prohibited, then Hawaiian Telephone would remain the monopoly provider of these services.

Assuming that alternative long distance telephone companies are not prohibited from entering the market, then both they and Hawaiian Telephone may be subject to varying degrees of regulation. Such regulation can encompass (1) market entry, where new companies might be required to demonstrate public need for the new service and fitness to operate, and/or (2) rate regulation, where there are many possible regulatory schemes that range from rate base/rate of return regulation, to prohibitions on price discrimination among customers, to simple requirements to provide notice of prices and pricing changes through filings price lists with the Hawaii Public Utilities Commission.

There are two levels at which policy is made and implemented. The Legislature can mandate a particular policy, for example, by requiring the Hawaii Public Utilities Commission to certificate all telecommunications providers and to regulate rates for providers. Alternatively, the Legislature could give the Commission discretion to determine whether certification and/or rate regulation are necessary for specific segments of the industry.

Analysis

The unique geography of the State of Hawaii presents fundamentally different conditions than those found in other states for firms that wish to offer telecommunications service in competition with the franchised local telephone company. As noted, it is likely that there are no economically viable alternatives for transmission between islands that can be developed, at least in the near term. Tel-Net may have identified and captured the only niche for limited competition with its digital microwave network. At the same time, Hawaiian Telephone's high rates for service between the islands act to limit demand for service. Without the possibility of effective competition for this traffic, Hawaiian Telephone has no incentive to restructure these rates. Thus, absent affirmative actions either by the Legislature or by the Hawaii Public Utilities Commission, there is likely to be little change in the pricing, usage or availability of telecommunications service between the islands.

Incentives and Disincentives in Present Interisland Rates. Consumers in Hawaii, most particularly business customers on the neighbor islands, have expectations for expansion of the telecommunications infrastructure that are important to continued economic development in Hawaii and should not be ignored. As discussed in Chapter 3, many -- indeed, virtually all -- economic development opportunities for Hawaii depend upon the availability of a state of the art telecommunications infrastructure. Many ventures in the planning stages, such as the University of Hawaii's initiatives and the research and technology park planned for Maui, assume that state of the art telecommunications facilities will be available, at prices that are affordable for the potential tenants of the park, when the venture is ready to begin operation. Existing industries that employ many

large numbers of residents, such as the visitor industry and the financial community, see opportunities to operate more efficiently or to expand services to their customers by incorporating new products or services into their operations that are based upon new telecommunications products and services. For example, hotels can centralize call answering and message taking services for their guests, and perhaps offer expanded services such as voice mail or data transmission services by installing centralized private branch exchange (PBX) equipment and using dedicated lines to connect several locations.

The attractiveness of strategy for connecting hotels on, for example, Oahu and Maui is presently limited by regulatory restrictions on installation of alternative facilities and by Hawaiian Telephone's prices for the dedicated facilities between islands. In general, in a free market the introduction of competitive alternatives would force down the rates for service where, as is the case here, the prices for the service exceed the cost of furnishing the service. Indeed, as discussed above, it appears that Hawaiian Telephone's dedicated service price reduction for the Hilo-Kona route was a direct response to the entry of a competitor on that route. However, the market for service between the islands has too many constraints to operate as a free market. As already noted, geographic and economic constraints make it unlikely that any additional facilities will be constructed to carry telecommunications traffic between the islands. Moreover, Hawaiian Telephone's rates continue to be regulated by the Hawaii Public Utilities Commission, and, hence, Hawaiian Telephone does not have unlimited ability to change its rates, even in response to the entry of a competitor. Thus, the question remains whether -- and how -- the State can influence the pricing and development of these facilities. In this regard, the experience of the Federal Communication Commission in the implementation of its access charge policy is relevant.

Source of Interstate Rate Reductions. There is a perception that the decision to allow competition in long distance service that resulted most particularly from the AT&T antitrust settlement and the break-up of the Bell System has significantly reduced rates for long distance service between states. This perception is not, however, entirely correct. While these actions certainly ensured that competitors such as MCI, Sprint, and Long Distance USA could exist (if not prosper), that alone was probably not enough to cause long distance rates to drop. Concurrent with these antitrust remedies, the Federal Communications Commission was implementing a policy of access charges paid by long distance companies to local telephone companies. This access charge plan eventually began to reduce the level of payments made by AT&T to the local telephone companies as compared with AT&T's payments before divestiture (which were structured to provide subsidies to local telephone services). Virtually all of the price reductions implemented by AT&T since 1984 have been ordered by the Federal Communications Commission to pass through these reductions in AT&T's payments. As AT&T reduced its rates, other long distance companies matched those reductions. Thus, overall, prices for interstate long distance calling have dropped dramatically over the last few years. Technological and regulatory changes, including the Federal Communications Commission's commitment to fostering competition in long distance service, have permitted alternative companies to exist; however, the reduction in *long distance rates* is due to the Federal Communications Commission's continued regulation of AT&T and not to the existence of the alternative long distance companies. The relevant point for Hawaii is that regulatory policy *can* bring about fundamental changes in rate levels and in rate structure.

of subsidy is often raised in the context of business concern regarding high rates for service between islands, it is not just business customers who are the source of the subsidy. Residential consumers also pay high rates for calls between islands and thus are a source of contribution. On the one hand, universal service for Hawaii's residents has been and remains an important social goal. On the other hand, there is a renewed State commitment to economic development, particularly on the neighbor islands. The State must strike the appropriate balance between support of these economic development goals, through policies designed to minimize the cost of having available a state of the art telecommunications infrastructure, and support of the residential consumer, through the availability of affordable basic telephone service.

The Resale Alternative: The benefits of increased calling between the islands suggest that even if one concludes that facilities-based competitive alternatives are unlikely to be developed, beyond Tel-Net's specialized alternative, consumers can benefit from a rate-restructuring. This restructuring need not be tied to introduction of resale alternatives; however, resale opportunities have offered consumers in some areas additional choices, including lower rates, in some areas. Given the absence of facilities-based competitors, it is unlikely that Hawaiian Telephone would move in this direction on its own initiative. However, a regulatory investigation of resale might lead to an agreement on a viable wholesale/retail tariff restructuring. Moreover, if there is a favorable balance among all pertinent factors, the stimulation in calling between islands could eventually lead to overall increased sales and earnings for Hawaiian Telephone. That result is by no means certain, but is one possible outcome of an aggressive policy to foster competition through resale.

Regulatory Options: The market for calling between islands raises perhaps the most unique problems for Hawaii. Unlike virtually all other areas of the country, facilities-based competitive alternatives are practically and economically impossible. Thus, deregulation of interisland calling will not -- and cannot -- lead to increased competition in telecommunications services. However, maintenance of the status quo in this area may not be in the best interest of the State. Both the high rates for existing services and the prohibition of options discourages innovation in many ways. These factors make the State less attractive to telecommunications-based and telecommunications-intensive industries, and repress the use of telecommunications services by all consumers, both business and residential. Nevertheless, the changes must be accomplished *through* regulation rather than through competition. The present law, which gives substantial regulatory authority and responsibility to the Hawaii Public Utilities Commission, may not prohibit such changes, but the law also does not prescribe policy options. In sum, in the area of interisland services, changes to the law may not be necessary, but a statement of policy may be desirable.

Notes

1. Tel-Net has not yet constructed its microwave facilities on Kauai and thus does not use its own facilities to furnish service to customers on Kauai. Tel-Net orders service from Hawaiian Telephone which is "resold" by Tel-Net to its customers on Kauai.

2. Rates for dedicated circuits are charged on a "per mile" basis. The per mile charge for a circuit between islands is *lower* than the per mile charge for a circuit whose end points are located on one island. Hence, Hawaiian Telephone's reclassification reduced the price for a circuit between Hilo and Kona.

3. Two additional alternatives -- traditional copper (or coaxial) cables and satellite facilities -- are even less practical as options at the present time. Standard cable facilities do not have enough capacity to make their continued use between islands practical. Satellite facilities have significant delay associated with the transmission that make this medium less than ideal for voice communications. In addition, the cost of such facilities is generally not attractive as compared with other alternatives because of the short distances involved. However, technological advances are improving the quality of the transmission and reducing the cost. Thus, it is not impossible that this will represent a third alternative at some time in the future.

4. Hawaiian Telephone has said that it does not have any present plans to use fiber. During an interview regarding this study, Hawaiian Telephone indicated that the depth of the channels and currents between islands made it impossible to install fiber. Others in the industry disagree, although they do agree that the installation would be costly. Hawaiian Telephone's position may reflect its belief that there is insufficient additional demand for capacity to justify the cost of installation.

5. It would make little sense to develop new analog microwave facilities between the islands since these facilities cannot support either the level of traffic or the high speed data needs that already exist in the State.

6. The FCC has allocated portions of these frequency ranges for the use of private network operators (gas and electric companies, for example), but these frequencies cannot be used to offer communications services to the public.

7. Price elasticities for the interisland market were reported by Robert T. Tanimura in his 1982 doctoral dissertation. The figures obtained by Dr. Tanimura in his study, which was conducted with the aid of Hawaiian Telephone, support the conclusion that there would be a substantial increase in calling between islands if there were significant price reductions. *See, An Analysis of Optimal Rate Regulation in Telecommunications; Deregulation of Intercity Communications and the Economically Efficient Structure of Telephone Prices*, Chapter V., Robert T. Tanimura, University of Hawaii, December, 1982.

Chapter 10

Conclusions

Hawaii faces unique challenges and opportunities as it guides its telecommunications policy into the future. In order to grow and prosper economically, the State must ensure that it provides an attractive environment for both existing and new businesses while maintaining high quality, affordable telephone service for the residents of the State. The telecommunications industry is evolving rapidly for technological and economic reasons, and hence, appropriate policies may also change with time.

The present jurisdiction of the Hawaii Public Utilities Commission requires that the Commission both certificate firms which plan to offer telecommunications services to the public and regulate the quality and price of those offerings. There is little, if any, flexibility for the Commission to vary its requirements or to require some firms, for example, non-dominant firms, to meet minimum filing requirements. Thus, there is little opportunity for the Hawaii Public Utilities Commission to vary its policies and treatments based upon its informed view of specific industry needs.

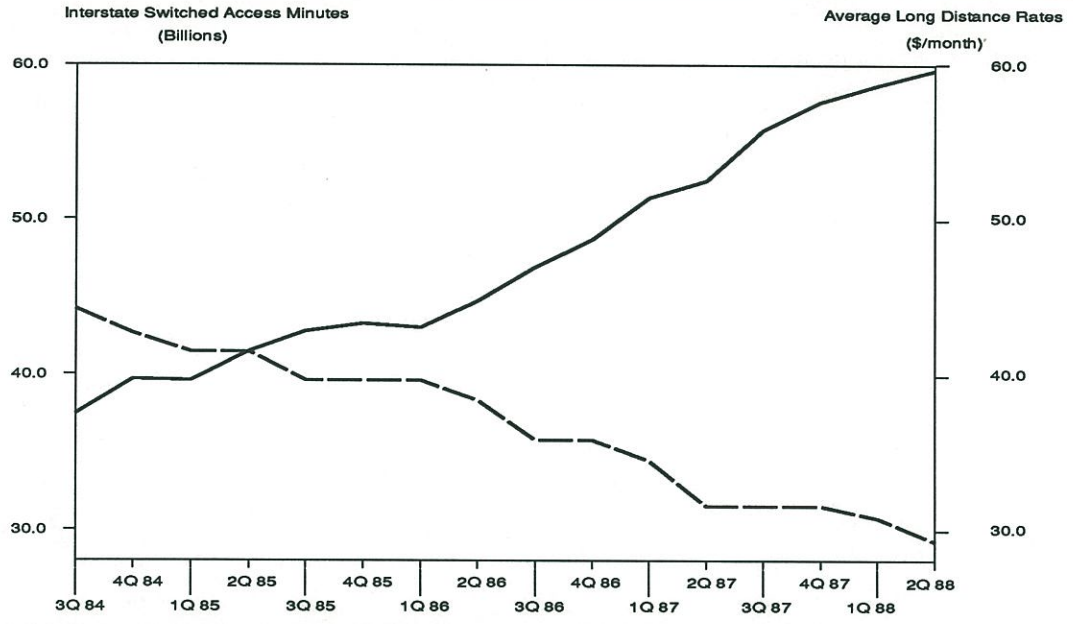
This lack of flexibility in development of an appropriate regulatory response to changes in the telecommunications industry will make it more difficult for the State to adapt its policies to meet changing needs. In general, for each of the areas examined in this report, one could conclude that the State would be best served by a telecommunications policy that provides the Hawaii Public Utilities Commission with (1) sufficient jurisdictional authority to continue to oversee the entry of firms into telecommunications markets and the pricing and availability of telecommunications services offered by those firms and (2) sufficient discretionary authority to tailor specific requirements to meet the specific conditions of the particular product or service in question. While the general conclusion is the same for each area studied, the reasons for the conclusions differ to some degree.

Bypass: The use of telecommunications facilities other than switched network facilities belonging to the local telephone company has been the subject of much controversy at both the state and federal levels. Some contend that the loss of traffic on the public switched network through bypass threatens the revenues for local telephone companies and could, eventually, lead to higher prices for those who remain on the network, especially residential customers with no other alternatives for service. In Hawaii, as elsewhere, this scenario of ultimate doom for local telephone companies and their customers seems to be overstated. Nevertheless, the State can benefit from a review of the conditions confronting telecommunications consumers in Hawaii to ensure that these customers are making economically correct decisions. The review is best done by the Hawaii Public Utilities Commission, which could respond to its findings through any number of actions including ordering changes to the regulated carriers' rate structures and/or appropriate policies for approval of new entrants to the telecommunications market.

Shared Tenant Services (STS)/Common Premises Communications Systems (CPCS): The use of a shared private branch exchange (PBX) system for a building or development complex has the potential of providing small business customers with sophisticated telecommunications features

Impact of Rate Reductions. It is also worth noting that the reduction in rates for interstate long distance service has fueled substantial growth in calling. Figure 9.1 shows a composite figure for reductions in long distance rates contrasted with the growth in number of minutes of long distance calls. It is readily apparent rate reductions have stimulated additional usage. It is likely that this same trend would be seen in Hawaii if rate reductions were implemented for calling between islands, and there would be substantial increases in calling between islands were the rates for these services to be reduced in similar proportions.[7]

Figure 9.1
Interstate Rate Reductions and Growth in Traffic



Key: —— = Interstate Switched Access Minutes
------ = Average Long Distance Rates (AT&T, MCI, US Sprint)

One disincentive to accomplishing such rate reductions is a concern expressed by Hawaiian Telephone that reductions in rates for services between islands would also reduce the level of contribution to local residential service from those services. Message Telephone Service is priced above cost and there is a substantial subsidy that flows to residential local telephone service. Hence, it is true that rates for interisland services cannot be restructured without a concurrent examination of the impact of the rate changes on the level of subsidy available.

However, several points can be made regarding this subsidy flow. First, the increase in service volumes resulting from rate reductions would at least partially offset the lost contribution attributable to lower rates. Second, there are options for targeting subsidies to consumers in need of aid rather than providing a subsidy for residential customers generally. Finally, while the concern with loss

and services that would not otherwise be available to them. Nevertheless, placing a developer or manager, rather than a certified common carrier, in the position of furnishing telecommunications services to the public has consequences for both the quality and availability of service. In addition, it alters some underlying assumptions that are used by the regulated local telephone company in developing rates for local service. Thus, while allowing such services increases the options for telecommunications service that are available to consumers, and can thus be viewed as beneficial, there are potential consequences for both consumers and other regulated firms which suggest that, if the service is allowed, providers and the regulated local telephone company who furnishes local service to the STS provider should both be subject to some regulation on availability and quality of service. It is both reasonable and appropriate for the Hawaii Public Utilities Commission to weigh the policy issues both pro and con, and to establish requirements that are in the best interests of all consumers in Hawaii.

Customer Owned Coin Operated Telephone Service (COCOTS): Since the federal deregulation of COCOTS, there has been rapid movement in the U.S. to open the market to competitive entry. All but four states, Hawaii being one of those four, permit competitive provision of pay telephone service, although with varying levels of restrictions and regulations. When it reviewed the subject, the Hawaii Public Utilities Commission was unconvinced that potential benefits arising from pay telephone competition, such as increased convenience, accessibility, and innovative features, would indeed materialize. Even if they did, the Commission was not sure that these benefits would outweigh countervailing costs, in particular, lost revenue contribution to, and therefore a possible reduction of, public telephones in those locations outside urban Honolulu where competition is less likely to develop. Despite the Hawaii Commission's doubts, there is a general perception that introduction of privately owned pay telephones is somewhat inevitable, in large part due to the entrepreneurial opportunities which such competition provides. Further, the Hawaii Public Utilities Commission does not have jurisdiction to restrict private pay telephone service limited to calling between Hawaii and the mainland or overseas. For these reasons, it may be best for the State to consider policies that permit privately owned pay telephones but that are also designed to minimize contribution losses and assure service quality standards.

Alternative Operator Services (AOS): Perhaps no industry has been as much maligned by negative consumer complaints as the AOS industry, i.e., those companies offering operator services to institutions, such as hotels, airports, hospitals, and pay telephones, which have a high volume of operator-assisted calls. Consumers report being subjected to excessive rates, mis-routed emergency calls, overcharging for uncompleted calls, receiving bills from unknown companies, and the inability to reach the long distance telephone company of their choice. Responses from states to the AOS controversy have been many, ranging from outright prohibitions on AOS for intrastate calling to implementation of certification requirements, rate caps, public information warnings, and various other restrictions. Interestingly, in Hawaii, there has been no controversy over AOS to date, in part due to restrictions on privately owned pay telephones and shared tenant services, and in part due to the relatively small level of interisland calling versus local calling. Nonetheless, for mainland U.S. and overseas calls, for which operator surcharges could be high, there is a market opportunity for AOS companies in Hawaii. Thus, it would be prudent for the State to examine policies such as those implemented in other states, including outright prohibition which could be justified based upon the unlikely benefits to consumers of AOS, to help prevent the type of consumer problems which have arisen elsewhere from occurring.

Interisland Telecommunications Service: Hawaii's unique geography limits the potential for facilities-based carriers to compete with Hawaiian Telephone in the provision of telecommunications services between islands. A single carrier, Tel-Net, has established digital microwave service across the State and offers dedicated, high speed data service to customers. It is unlikely, however, that any additional firms could use microwave facilities to offer either data or voice services since the suitable and available microwave spectrum has been allocated to Hawaiian Telephone and Tel-Net. Absent viable competition in this market, there is no reason to believe that any deregulation is appropriate. Indeed, since the market is a virtual monopoly, with Tel-Net offering a limited alternative for certain specialized services, deregulation would likely be harmful to consumers. At the same time, the rates for telecommunications service between islands are quite high. These high rates discourage calling between islands and make economic development plans of the neighbor islands less attractive. The disincentives associated with high rates are detrimental to residential and business consumers alike, and the impact on economic development may be contrary to other State policy goals. Thus, changes to the rate structure for calling between islands, which can be accomplished through regulatory proceedings, may be both reasonable and desirable for the State. While the Hawaii Public Utilities Commission does presently have the jurisdiction to accomplish such rate restructuring, it is also appropriate for the Legislature to provide policy guidance by articulating the State's goals for economic development and affordable telecommunications service.

In summary, in each area there are policy choices which range from complete deregulation to maintaining the status quo. Neither extreme is likely to meet the State's needs. As industry technology develops and as the State continues to pursue economic development goals, there are opportunities to open up markets and to allow more flexibility, without completely abandoning regulation of existing providers or new entrants, or abrogating the State's commitment to universal telephone service for residential customers. Like the industry itself, these options will evolve over time. To meet the challenge of this evolutionary process, the State should be equipped with a regulatory system that maintains sufficient authority over telecommunications suppliers to ensure that high quality, reasonably priced telecommunications services are available yet also permits the regulatory agency to develop specific requirements tailored to meet changing needs for regulatory control.

RESPONSES OF THE AFFECTED AGENCIES

COMMENTS ON AGENCY RESPONSES

A preliminary draft of this study was transmitted on December 21, 1988, to the Public Utilities Commission, the Department of Commerce and Consumer Affairs, and the Department of Budget and Finance. We asked each of the agencies for their comments on the report.

A copy of the transmittal letter to the Public Utilities Commission is included as Attachment 1 of this section. Similar letters were sent to the directors of the Department of Commerce and Consumer Affairs and the Department of Budget and Finance. Two of the three departments responded and their responses are included as Attachments 2 and 3.

In its response, the Public Utilities Commission indicated it would like the Legislature to provide the commission with flexibility in its regulatory authority to deal with the present and emerging telecommunications businesses. On the other hand, the Division of Consumer Advocacy would have preferred more specific information on Hawaii's telecommunication markets in comparison with mainland markets as well as more detailed information on the benefits and disadvantages of changes in the regulatory climate for ratepayers, the utilities, and potential customers.

ATTACHMENT 1

THE OFFICE OF THE AUDITOR
STATE OF HAWAII
465 S. KING STREET, RM. 500
HONOLULU, HAWAII 96813

CLINTON T. TANIMURA
AUDITOR

COPY

December 21, 1988

Mr. Yukio Naito, Chairman
Hawaii Public Utilities Commission
465 South King Street, Room 103
Honolulu, Hawaii 96813

Dear Mr. Naito:

Enclosed are three copies, Nos. 5 through 7 of our preliminary report on *Telecommunications in Hawaii: Policy, Economics, and the Changing Industry*, jointly prepared under the supervision of this office by Economics and Technology, Inc. of Boston, Massachusetts and Paul, Johnson, Alston & Hunt, Attorneys at Law of Honolulu, Hawaii. This study was prepared pursuant to Act 331, Session Laws of Hawaii 1988.

We invite your comments on the report. If you decide to submit comments, we ask that you (1) notify us by telephone of this intention by December 27, 1988, and (2) submit your written comments by January 11, 1989, so that they can be included in the final report.

Since the report is not in final form and there could be changes to the report, access to it should be restricted to those persons whom you might wish to call upon to assist you in reviewing the report. The only other parties who have been provided with copies of this preliminary report are the Governor, the presiding officers of the Legislature, the Director of the Department of Budget and Finance, and the Director of the Department of Commerce and Consumer Affairs. Public release of the report will be made solely by our office and only after the report is published in its final form and submitted to the Legislature.

We appreciate the assistance and cooperation extended to us during the course of the study.

Sincerely,

Clinton T. Tanimura

Clinton T. Tanimura
Legislative Auditor

Enclosures

ATTACHMENT 2

JOHN WAIHEE
Governor

ROBERT A. ALM
Director of
Commerce and Consumer Affairs

STATE OF HAWAII
DIVISION OF CONSUMER ADVOCACY
DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS
P. O. BOX 541
HONOLULU, HAWAII 96809

CHARLES W. TOTTO
Executive Director

January 11, 1989

Mr. Newton Sue
Office of the Legislative Auditor
465 South King Street, Suite 500
Honolulu, Hawaii 96813

RE: Telecommunications in Hawaii: Policy, Economics, and the Changing Industry.

Dear Mr. Sue:

By your letter dated December 21, 1988, you requested review and commentary by the Department of Commerce and Consumer Affairs on the "Circulating Draft" of the above-entitled document. The Division of Consumer Advocacy appreciates the opportunity you have provided us to comment on the report's review of Shared Tenant Services, Customer-Owned Coin Operated Telephone Systems, Interisland Services, Alternative Operator Services and By-Pass.

By statute, the Division of Consumer Advocacy is mandated to "represent, protect, and advance" the interests of consumers of utility services. The Division has urged that reasonably priced telecommunications services be provided to Hawaii's consumers with a high degree of reliability, in compliance with defined quality standards. Because new demands for innovative telecommunications services are expanding rapidly, the timeliness of the introduction of innovative services in competitive markets is becoming as important a factor as reliability and economy. The Division thus finds itself in accord with many of the recommendations and suggestions provided in your study for regulatory flexibility while safeguarding ratepayer interests.

The study does have shortcomings, though. No doubt these are due to time and funding limitations in light of the complexity of each of the selected topics. However, virtually no quantitative or economic analyses were conducted of the demand in discrete segments of the telecommunications industry in Hawaii. Additionally, there is no assessment of Hawaii markets compared to mainland markets. Moreover, the benefits and disadvantages of changes in the regulatory scheme for the ratepayers, the monopoly carrier, and potential competitors are not evaluated in detail. As a result, specific recommendations regarding each of the topics examined was not forthcoming.

It is regrettable that the constraints of time and funding imposed upon the study precluded a more detailed analysis of user demands and the nature and number of potential providers of new innovative services. Compilation of such data and analysis of same would have greatly assisted the Legislature and the Hawaii Public Utilities Commission in determining appropriate modifications to the regulatory regime.

In any event, you can be assured that this agency will work with your office's staff, your consultant, and the regulated and non-regulated providers of telecommunications services to assist the Hawaii Legislature and the Hawaii Public Utilities Commission in its consideration of the findings and recommendations contained in the study.

Thank you again for inviting us to comment.

Sincerely yours,

Charles W. Totto
Executive Director

ATTACHMENT 3

JOHN WAIHEE
GOVERNOR

Yukio Naito
CHAIRMAN
Patsy Young
COMMISSIONER
CLYDE S. DUPONT
COMMISSIONER

STATE OF HAWAII
PUBLIC UTILITIES COMMISSION
DEPARTMENT OF BUDGET AND FINANCE
465 S. KING STREET
KEKUANAOA BUILDING, FIRST FLOOR
HONOLULU, HAWAII 96813

January 12, 1989

Mr. Newton Sue
Acting Legislative Auditor
Office of the Legislative Auditor
465 South King Street, Room 500
Honolulu, Hawaii 96813

Dear Mr. Sue:

Thank you for the opportunity to review and comment on the preliminary report on Telecommunications in Hawaii: Policy, Economics, and the Changing Industry.

As the report suggests, there are a number of regulatory policy options in each of the areas examined. Generally, in each of the areas, the options are (1) to regulate or not regulate and (2) if regulation is desired, the extent and scope of the regulation. These policy options may be decided by the legislature itself or left to the public utilities commission to determine.

Each of the areas examined in the report raises a variety of issues and concerns. These issues and concerns require in-depth examination, in light of the broad state objectives (stated in the report) of economic development and assurance of universal local telephone service at affordable rates, before any regulatory policy decision is made. The issues and concerns are complex, and the rapidly improving and expanding technology in the telecommunication field is likely to increase the number and kind of entrepreneurial opportunities beyond those examined in the report.

If we are correct in our assessment set forth in the preceding paragraph, it would appear that the most prudent course is for the legislature to provide the public utilities commission with flexibility in its regulatory authority to deal with the present and emerging telecommunication businesses. Such flexibility would leave it to the commission to determine whether a given enterprise should be regulated and, if so, to what extent. The desirability of granting of such flexibility to the commission, it would seem, is underscored when one considers that various areas of the

telecommunication field are interrelated in such a fashion that a decision in one may impact greatly on the others. Flexibility in the commission could ensure the development of a cohesive policy in the telecommunications field.

Very truly yours,

Yukio Naito
Chairman

APPENDICES

Appendix A

Hawaiian Telephone Rate Structure

Source:

GTE/Hawaiian Telephone Tariffs

• Local Exchange Service Rates •

Business Service - Individual Line:	
Oahu	$34.80
Hawaii	25.75
Maui	23.70
Kauai	23.70
Molokai	19.25
Lanai	16.95

Type "A" Access Line - PBX Trunk:	
Oahu	$54.80
Hawaii	39.85
Maui	36.35
Kauai	36.35
Molokai	29.20
Lanai	25.65

Residence Service - Individual Line:	
Oahu	$14.10
Hawaii	12.75
Maui	12.20
Kauai	12.20
Molokai	10.60
Lanai	9.65

Appendix B

Intrastate Competition and Regulation

Source:

State Telephone Regulation Report, Nov. 5, 1987

and Economics and Technology, Inc. Research

Intrastate Competition and Regulation

State	Inter-LATA	IntraLATA IX Carriers	IntraLATA Resellers	AT&T	OCC	Reseller
Alabama	Yes	No	Yes	A,R,P	A,R,P	A,P
Alaska*	n/a	Pending	Pending	n/a	P	P
Arizona	Yes	No	Yes	B,R	B,R	D
Arkansas	Yes	No	Yes	A,R,P	A,P	A,P
California	Yes	Partial	No	A,R,P	D	D
Colorado	Yes	Yes	Yes	A,P	A,P	D
Connecticut*	n/a	No	Yes	n/a	P	P
Delaware*	n/a	Yes	Pending	P	P	P
Florida	Yes	Partial	Yes	B,R	D	D
Georgia	Yes	No	Yes	B,P	B,P	D
Hawaii*	n/a	Partial	No	n/a	A	n/a
Idaho	Yes	Yes	Yes	C,R,P	P	D,P
Illinois	Yes	Yes	Yes	F	F	F
Indiana	Yes	No	Yes	A,R,P	A,P	A,P
Iowa	Yes	Yes	Yes	A,R	A,R	A,R
Kansas	Yes	Pending	Pending	B,R	D	D
Kentucky	Yes	No	Yes	A,R,P	D	D
Louisiana	Yes	Partial	Yes	B,R	D	D
Maine*	n/a	Pending	Partial	P	P	A,P
Maryland	Yes	Yes	Yes	D	D	D
Massachusetts	Yes	Yes	Yes	A,R	A	A
Michigan	Yes	Yes	Yes	B,R,P	D	D
Minnesota	Yes	Yes	Yes	D	D	D
Mississippi	Yes	No	Yes	B,R	B	D
Missouri	Yes	Yes	Yes	B,R,P	B,P	B,P
Montana	Yes	Yes	Yes	C,R	D	D
Nebraska	Yes	Yes	Yes	D	D	D
Nevada	Yes	No	No	D	D	D
New Hampshire*	n/a	No Action	No Action	n/a	n/a	n/a
New Jersey	Yes	No	Yes	B,R	B	D
New Mexico*	n/a	Yes	Yes	A,R	A	A
New York	Yes	Yes	Yes	B,R,P	C,P	C,P
North Carolina	Yes	No	Yes	C	D	D
North Dakota	No Action	No	Yes	n/a	n/a	D
Ohio	Yes	Yes	Yes	B,P	B,P	B,P
Oklahoma	Yes	No	Yes	A	A	D,P
Oregon	Yes	Yes	Yes	B	D	D
Pennsylvania	Yes	Yes	Yes	A	A	D
Rhode Island*	n/a	No Action	No Action	n/a	n/a	n/a
South Carolina	Yes	Partial	Yes	C	C	C
South Dakota*	n/a	No	Yes	n/a	n/a	D,P
Tennessee	Yes	No	Yes	C	D	D
Texas	Yes	Yes	Yes	B,R	D	D
Utah*	n/a	No	Yes	n/a	n/a	D
Vermont*	n/a	Yes	Yes	n/a	D	D
Virginia	Yes	No	Yes	D	D	D
Washington	Yes	Yes	Yes	D	D	D
West Virginia	Yes	Pending	Pending	D	D	D
Wisconsin	Yes	Pending	Yes	A,R,P	A,P	D
Wyoming*	n/a	No	Yes	n/a	n/a	A

A - No pricing flexibility; any tariff change requires prior state approval
B - Banded rates; company free to move rates between ceiling and floor levels
C - Ceiling prices only; company can set rates at any point below rate ceiling
D - Full pricing flexibility; company may reprice without prior state review
F - Floor prices only; company can set rates at any point above floor level
P - Pending proceeding may result in changes to regulation in the future
R - Rate of return prescribed by state

* Single-LATA state. Does not take into account the fact that border LATAs from other states may exist. In such states where there are border LATAs, the state is still classified as a single-LATA state.

Source: State Telephone Regulation Report, November 5, 1987; revised from ETI sources.

Appendix C

Local Access and Transport Area Maps

United States

South Dakota

Illinois

New York

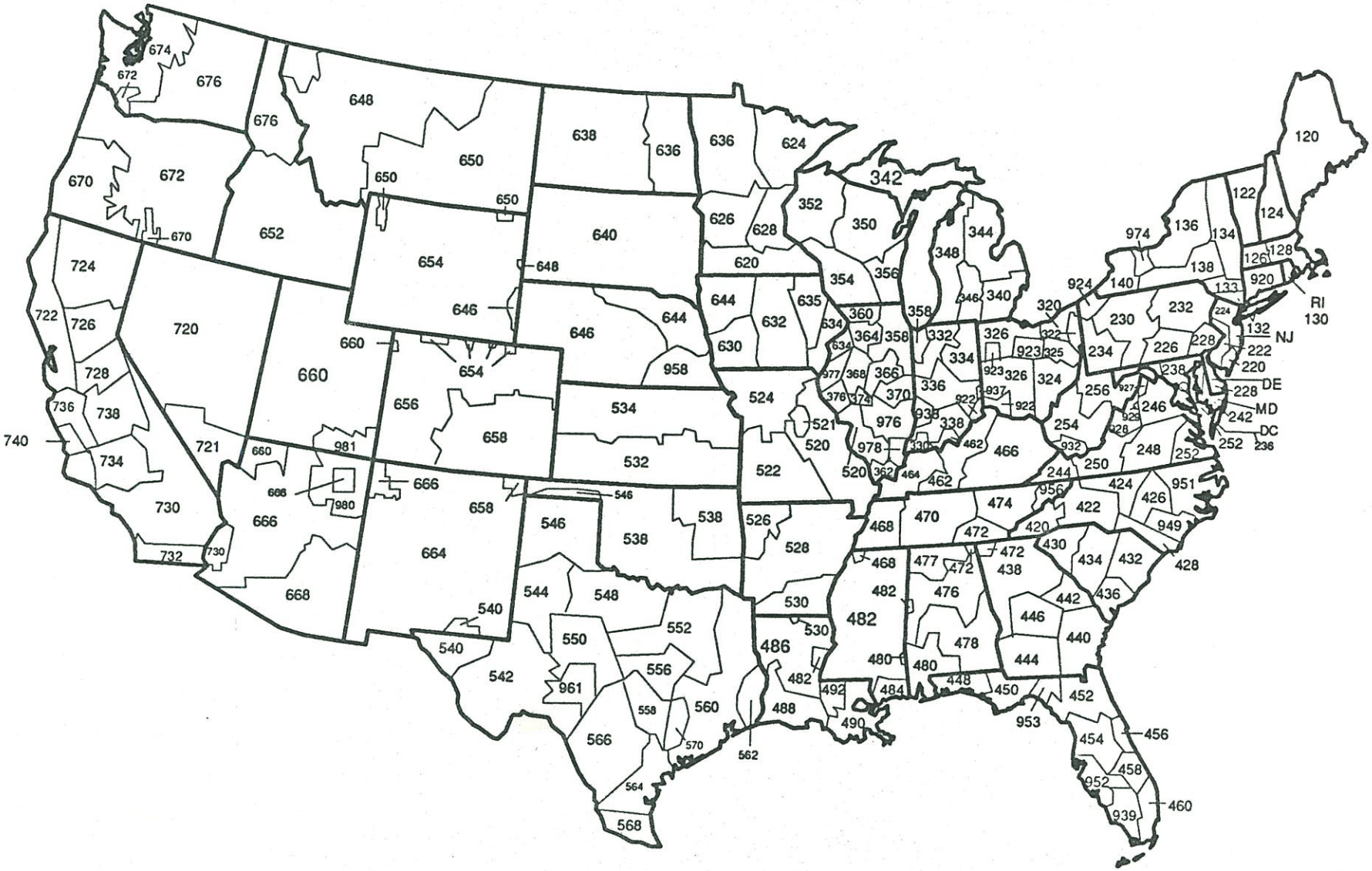
Arizona

Ohio

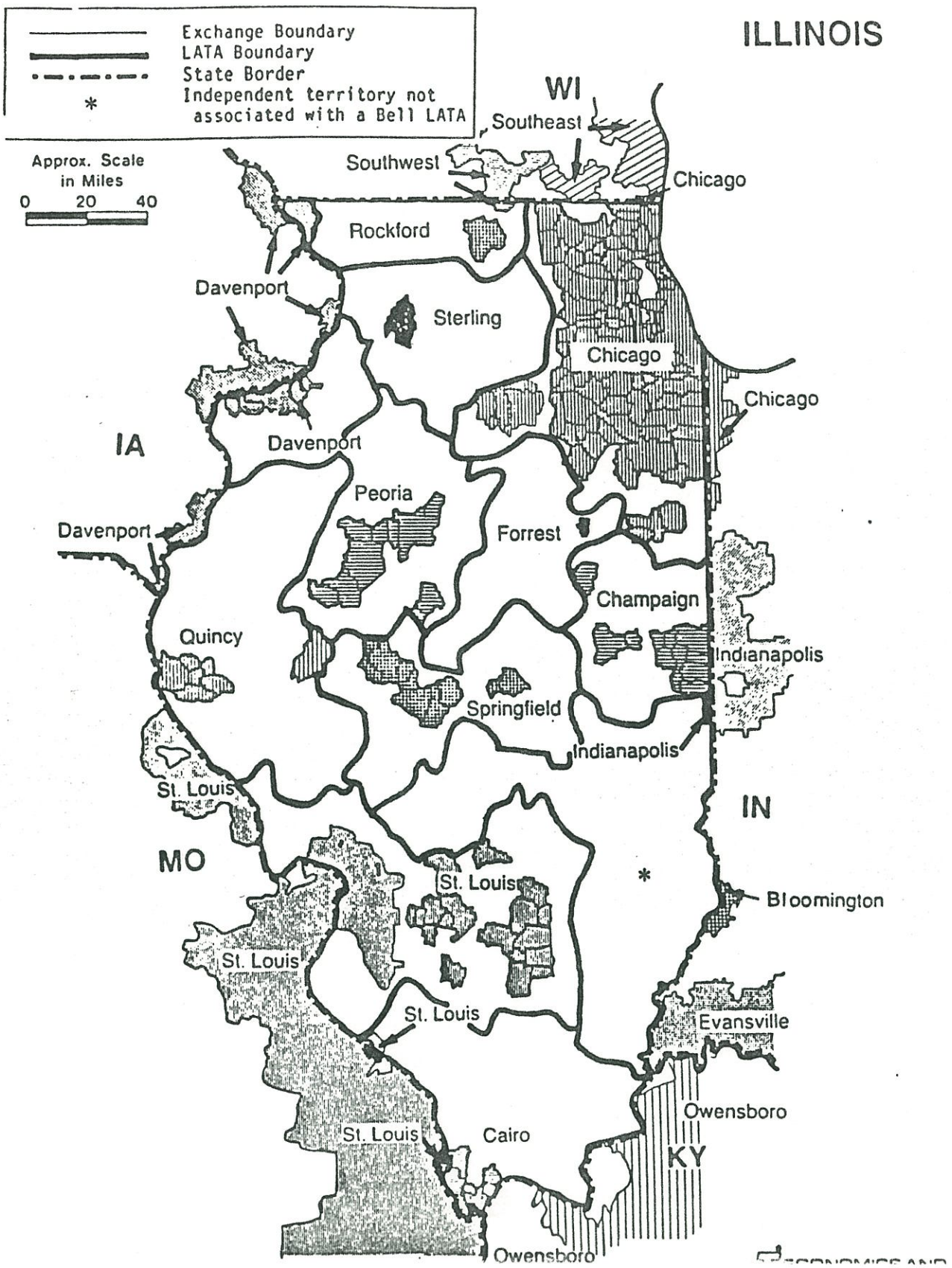
Source:

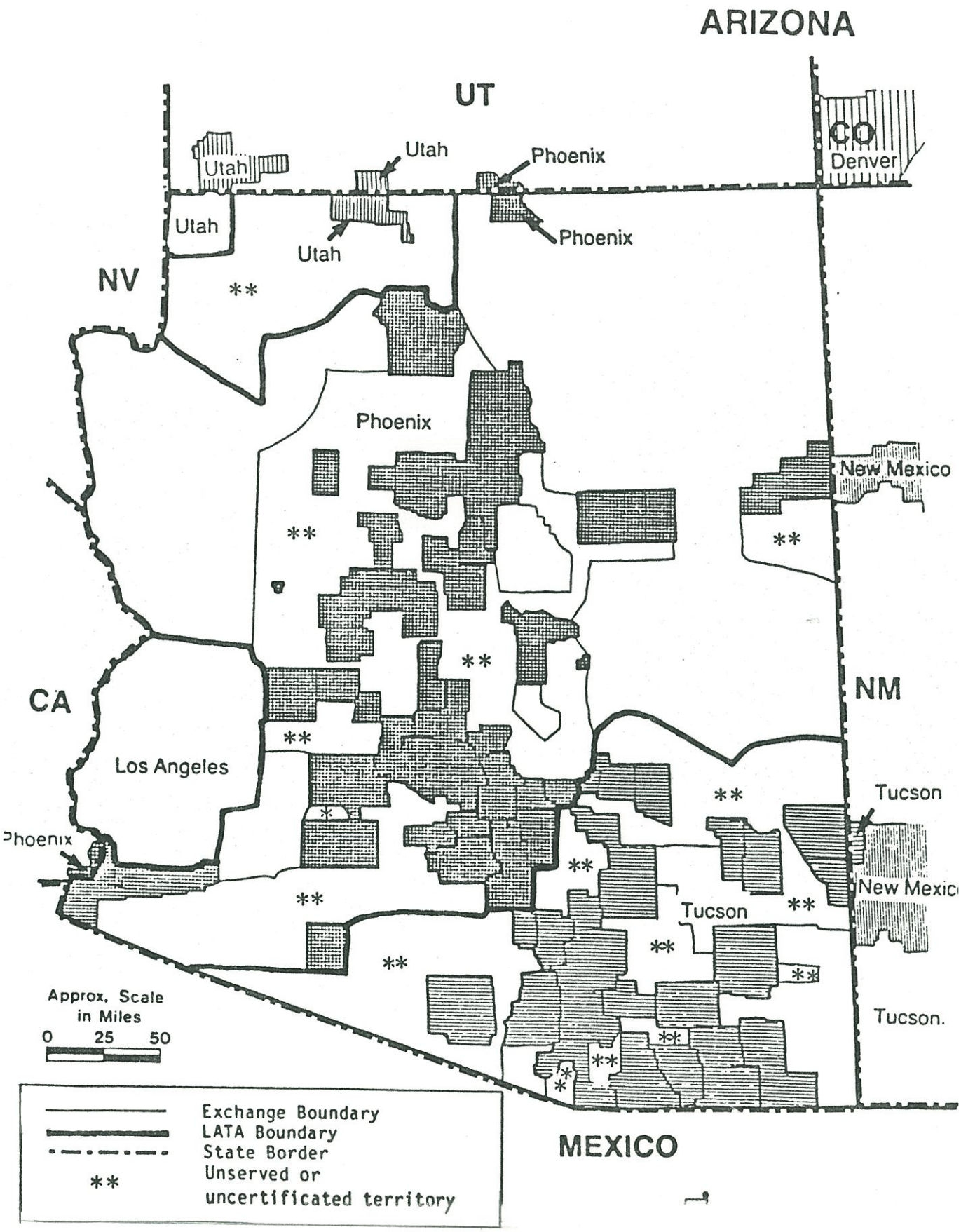
Economics and Technology, Inc., LATA Handbook

LOCAL ACCESS AND TRANSPORT AREAS (LATAs)



Bismarck
ND
Bismarck
Brainerd-Fargo
Brainerd-Fargo
Brainerd-Fargo
Bismarck
Brainerd-Fargo
St. Cloud
MT
St. Cloud
MN
South Dakota
South Dakota
Rochester
South Dakota
Wyoming
WY
Rochester
Grand Island
Omaha
Omaha
Sioux City
Sioux City
Omaha
South Dakota
Omaha
Grand Island
Omaha
Omaha
Sioux City
IA
NE
Approx. Scale in Miles
0 25 50
Exchange Boundary
LATA Boundary
State Border
ECONOMICS AND TECHNOLOGY, INC
SOUTH DAKOTA


ILLINOIS
Exchange Boundary
LATA Boundary
State Border
* Independent territory not associated with a Bell LATA
Approx. Scale in Miles
0 20 40
WI
Southeast
Southwest
Chicago
Rockford
Davenport
Sterling
Chicago
Chicago
IA
Davenport
Peoria
Davenport
Forrest
Champaign
Quincy
Indianapolis
Springfield
Indianapolis
St. Louis
IN
MO
St. Louis
*
Bloomington
St. Louis
St. Louis
Evansville
Owensboro
St. Louis
Cairo
KY
Owensboro


ARIZONA
UT
CO
Denver
Utah
Utah
Utah
Utah
Phoenix
Phoenix
NV
Phoenix
New Mexico
CA
NM
Los Angeles
Tucson
Phoenix
New Mexic
Tucson
Tucson.
Approx. Scale
in Miles
0 25 50
Exchange Boundary
LATA Boundary
State Border
Unserved or
uncertificated territory
MEXICO

MI
Detroit
Toledo
Cleveland
Pittsburgh
Youngstown
Youngstown
Akron-Canton
Pittsburgh
Youngstown
PA
Clarksburg
burn -Huntington
IN
Indianapolis
Indianapolis
Dayton
Columbus
Clarksburg
Columbus
Charleston
Charleston
Charleston
WV
Charleston
Winchester
KY
Approx. Scale
in Miles
0 20 40
Exchange Boundary
LATA Boundary
State Border
ECONOMICS AND TECHNOLOGY, INC

119

OHIO

Glossary

Access Charges - fees imposed by Local Exchange Carriers on Interexchange Carriers and End Users to defray that portion of the costs of the LEC's facilities that are associated with or otherwise assigned to the provision of interexchange services.

Access tandem - an LEC switching facility that aggregates switched access traffic from (or to) a number of individual end offices for delivery to (or receipt from) an interexchange carrier.

Alternative Operator Services (AOS) - companies that are unaffiliated with local or long distance carriers, and provide operator services and long distance connections from telephones in hotels, hospitals, and other institutions, as well as public telephones. AOS operators usually add a surcharge for the service, and often pay a commission to the owner of the telephone system to which the AOS is connected.

Bell Operating Company (BOC) - a local exchange carrier that was formerly part of the Bell System prior to the break-up of AT&T. There are seven *Regional Bell Operating Companies* each one of which has one or more operating company subsidiaries.

Busy hour - the hour of the day in which the resource (i.e., central office, interoffice network, etc.) is subject to the highest level of usage.

Busy hour minutes of use - the amount of usage that occurs during the busy hour - a measure of peak load capacity requirements.

Bypass - a term sometimes used to describe arrangements that avoid use of local exchange carrier switched access services and hence avoid payment of switched access charges. "Service bypass" generally refers to the use of other LEC services (such as Special Access or Private Line), while "Facilities bypass" generally refers to the use of a non-LEC transport facility to interconnect the customer's premises with the interexchange carrier's Point of Presence.

Carrier Common Line Charge (CCLC) - a usage-based access charge rate element that is intended to recover those Non-Traffic-Sensitive costs assigned to the interstate jurisdiction that are not recovered directly through the Subscriber Line Charge. The CCLC is paid to the LECs by interexchange carriers, who in turn include these charges in the rate they charge their customers for long distance (toll-type) calling services.

Central Office (CO) - a telecommunications switching facility.

Class 5 central office - the lowest level in the network switching hierarchy. See also *End Office.*

Class 4 toll central office - the lowest level in the toll network switching hierarchy.

Common Line - the basic telephone service "dial tone" access line used by a business or residential subscriber to originate and receive local and long distance calls. See also *Subscriber Line* and *Dedicated Access Line.*

Common Premises Telecommunications Systems (CPCS) - see *Shared Tenant Services (STS).*

Customer Access Line Charge (CALC) - see *Subscriber Line Charge.*

Customer Owned Coin Operated Telephone System (COCOTS) - coin (or "pay") telephones that are owned and operated by private companies as opposed to the local exchange carrier. COCOTS owners pay the LEC for connection to the local network, and retain all additional revenues.

Customer Premises Equipment (CPE) - telephone sets, private branch exchange (PBX) systems, and other equipment located on the customer's premises. Under the terms of the FCC's *Second Computer Inquiry* ruling, all Bell CPE was deregulated as of January 1, 1984.

Dedicated Access Line (DAL) - a special access facility that connects a subscriber's premises with the local end office, from which a connection to the interexchange carrier's Point of Presence is accomplished using local exchange carrier switched access and transport services, and which is not used for other than interexchange carrier access. See also *Wide Area Telecommunications Service* and *Common Line.*

Division of Revenues (DR) process - a pre-divestiture toll revenue allocation system among the Bell System operating companies and AT&T's Long Lines Department.

Dominant Carrier - the telecommunications carrier having the predominant market share and thereby able to exercise market power.

"800 Service" - see *Wide Area Telecommunications Service.*

End Office - the local central office that normally serves an individual subscriber. See also *Class 5 central office.*

End User - the ultimate consumer of the service. Most access services are furnished by LECs to interexchange carriers, who combine them with their own transport service in furnishing an end-to-end service to their customers.

End User Common Line Charge (EUCLC) - see *Subscriber Line Charge.*

ENFIA - a transitional interstate carrier access charge system for Other Common Carriers (OCCs) adopted by the FCC in 1979. The term stands for "Exchange Network Facilities for Interexchange Access," and was replaced by the FCC's interstate access charge system adopted in May, 1984.

Equal Access - a requirement of the divestiture decree that the divested Bell Operating Companies offer switched access and other interconnections to all interexchange carriers of a type that is equivalent to that furnished to AT&T. See also *Premium Access* and *Non-premium Access*.

Equal Access Exchange Area (EAEA) - (Florida Public Service Commission) a geographical region within the state of Florida generally corresponding to the area served by a LEC Class 4 toll switch within which competition with LEC services is prohibited.

Facilities-Based (FB) carrier - a carrier that owns a substantial interexchange transport network. See also *Resellers*.

Federal Communications Commission (FCC) - the federal administrative agency responsible for regulation of interstate and foreign telecommunications services.

Federal-State Joint Board - a board consisting of representative FCC and state public utility commissioners established on an issue-by-issue basis for the purpose of addressing policy matters affecting the relationship between state and federal regulatory jurisdictions.

Feature Group - a collection of switched access service features offered by LECs as a package to interexchange carriers and end users.

Foreign Exchange (FX) service - a hybrid private line switched service arrangement in which an interexchange private line is used to provide a subscriber with dial tone from a central office or exchange area other than the one that would normally furnish local service.

High Cost Factor - an element of the Carrier Common Line Charge (CCLC) that is intended to provide a subsidy to small local exchange carriers with extraordinarily high subscriber line costs.

Independent operating company - a non-BOC local exchange carrier.

Interexchange Carrier (IEC or IC) - a telecommunications common carrier that provides service among its various Points of Presence in various local exchange service areas, using the facilities of the Local Exchange Carriers to interconnect its network with individual subscribers.

Interexchange transport - the carriage of a call between exchanges (or LATAs) by an interexchange carrier.

Interoffice transport - the routing of a call between different LEC central offices or between an LEC end office and the interexchange carrier's Point of Presence.

Interstate service - a service furnished in connection with a call the two ends of which are located in different states. An access connection between a customer's premises and an interexchange carrier's Point of Presence both of which are located in the same state would still be treated as an interstate service if the ultimate interexchange call were to an out-of-state point.

Intrastate service - a service furnished in connection with a call the two ends of which are located in the same state.

Jurisdictional Separations and settlements - the process by which costs and revenues are allocated among the federal and state jurisdictions for regulatory accounting and rate-setting purposes.

"Leaky PBX" - the potential ability of a customer to interconnect an interexchange private line to a non-access service ordinary business exchange line through a Private Branch Exchange (PBX) telephone system, thereby avoiding the imposition of switched access charges on the interexchange call.

"Lifeline" exemption - a program available to state regulatory agencies that permits qualifying low-income residential customers to be exempted from payment of the FCC Subscriber Line Charge.

Local Access and Transport Area (LATA) - The geographical area within which a Bell Operating Company may provide local and interexchange service under the terms of the divestiture settlement. With minor exceptions involving adjacent LATAs, BOCs may not provide service *between* LATAs.

Local Exchange Carrier (LEC) - the franchised local telephone company that provides basic dial tone service to individual business and residential subscribers. The LEC typically owns the local Subscriber Line plant, local central offices, interoffice trunking facilities, and intermediate or "tandem" switching facilities. The LEC provides exchange telephone service to connect individual subscribers within its own local service territory, and provides access interconnections between its subscribers and Interexchange Carriers at the latter's Points of Presence for calls that go to points beyond the limits of the LEC's service territory.

Local Exchange Service - the basic subscriber line and local message services normally furnished to individual residential and business subscribers by a Local Exchange Carrier.

Local Loop - see *Subscriber Line.*

Message Toll Service (MTS) - ordinary "long distance" telephone calls that are originated and completed over a *Common Line* and which are charged on a per-call basis.

Minutes of Use (MOU) - a standard measurement of switched access service usage upon which most carrier switched access charge rate elements are based.

Modification of Final Judgment (MFJ) - the divestiture decree adopted in 1982 by the United States District Court for the District of Columbia that formed the basis for the break-up of AT&T and the various line of business and other restrictions on the Bell Operating Companies.

Non-Dominant Carrier - a telecommunications carrier with a relatively small market share that is not able to exercise market power.

Non-premium access - a form of switched access furnished by the LECs to the OCCs prior to the adoption of "equal access" as required by the MFJ. This typically required the caller to dial a local access number, receive a second dial tone from the interexchange carrier, enter a Personal Identification Number (PIN), followed by the called number. Non-premium access typically did not provide signal amplification, answer and off-hook supervision, automatic number identification, and other features associated with premium access.

Non-Traffic-Sensitive (NTS) costs - investment and operating costs, including depreciation and return on investment, associated with telephone company facilities the existence and amount of which do not vary with the aggregate level of usage (i.e., number of calls, minutes of use) of the telephone system. The principal NTS component is the Subscriber Line connecting each individual customer's home or business premises with the local telephone company central office.

Other Common Carrier (OCC) - a term that is generally applied to interexchange carriers other than AT&T.

PBX - Private Branch Exchange telephone system used to provide internal telephone service to medium and large business/government/institutional users.

Point of Presence (POP) - the location at which the interconnection between the LEC and the IEC is made. An IEC may maintain one or more POPs in each LATA in which it desires to provide service.

Premium access - the form of switched access interconnection traditionally furnished by the local exchange carriers to AT&T. See also *Non-premium access*.

Presubscription - an arrangement whereby an individual subscriber may designate one interexchange carrier over whose facilities interLATA calls dialed on a "1+" basis will be routed. Under the terms of the MFJ, BOCs are required to offer presubscription choices in all central offices equipped for equal access, but only interLATA calls are required to be routed to the selected carrier. IntraLATA calls continue to be routed via the BOC even if the presubscribed carrier is authorized to provide the intraLATA service.

Private Line Service - a permanent connection between two customer premises generally not involving central office switching operations.

Public Utility Commission (PUC) - a state agency that regulates telecommunications and other utilities. Sometimes named "public service commissions," "corporation commissions," or other local variation.

Regional Bell Operating Company (RBOC) - one of the seven holding companies created by the 1982 divestiture decree that settled the United States Deparment of Justice antitrust case against AT&T. The seven RBOCs and their respective operating company subsidiaries are: NYNEX Corporation (New York Telephone Company and New England Telephone Company); Bell Atlantic Corporation (New Jersey Bell, Bell of Pennsylvania, Diamond State Telephone, and the Chesapeake and Potomac Telephone Companies of Maryland, Virginia, West Virginia and the District of

Columbia); BellSouth Corporation (Southern Bell and South Central Bell); Ameritech Corporation (Michigan Bell, Ohio Bell, Indiana Bell, Illinois Bell, and Wisconsin Telephone Company); Southwestern Bell Corporation (Southwestern Bell Telephone Company); U S West (Northwestern Bell, Mountain Bell, and Pacific Northwest Bell); and Pacific Telesis Group (Pacific Bell and Nevada Bell). Two other former Bell System operating companies - Southern New England Telephone and Cincinnati Bell, Inc. - were not majority owned by AT&T and are not considered BOCs for purposes of the various restrictions and limitations imposed by the antitrust settlement.

Reseller - a carrier that generally does not own its own transport facilities, but instead combines access services purchased from the LECs with transport services purchased from facilities-based interexchange carriers to offer end-to-end services to its customers.

Shared Tenant Services (STS) - also known as Shared Telecommunications Systems and, in Hawaii, Common Premises Communication Systems (CPCS). The provision of telephone services to tenants of a building or development complex on a shared basis. The STS operator provides local and long distance connections through a common PBX within the complex, by purchasing access services in bulk and reselling them to tenants.

Special Access - permanent, dedicated private-line type connection between an individual subscriber and an interexchange carrier's Point of Presence.

Special Access Surcharge - a fee imposed on an interexchange private line that is capable of being interconnected to the local exchange by means of a customer PBX system. See also *"Leaky PBX"* and *PBX*.

Subscriber Line Charge (SLC) - A fixed monthly surcharge that is included in the total monthly basic telephone service rate imposed on individual subscribers. The "interstate Subscriber Line Charge" is determined by the FCC and recovers a portion of the interstate-assigned Non-Traffic-Sensitive costs. The balance of these NTS costs that are not recovered through the SLC are recovered through the Carrier Common Line Charge (CCLC). Note that this rate element is sometimes referred to as the "Customer Access Line Charge" (CALC) or the "End User Common Line (EUCL) charge."

Subscriber Line Usage (SLU) factor - factor expressing the relative use of Local Exchange Carrier plant among local, intrastate toll and interstate toll services. Used for jurisdictional separations purposes.

Subscriber Plant Factor (SPF) - the factor by which Non-Traffic-Sensitive (NTS) costs are assigned between the interstate and state jurisdictions. Currently, the SPF is scheduled to become fixed at 25% interstate nationwide, after a transition period.

Switched Access - temporary dial-up type connection between an individual subscriber and an interexchange carrier's Point of Presence.

T1 - a standard transmission capacity unit for digital communication, expressed as 1.544 Megabits per second. T1 circuits are typically multiplexed into either 24 or 44 voice grade circuits.

Tandem office - an intermediate switching facility used to interconnect other central offices with each other and with interexchange carriers. See also *Access Tandem.*

Traffic-Sensitive (TS) costs - investment and operating costs, including depreciation and return on investment, associated with telephone company facilities whose aggregate quantity varies with the volume of calls (and other measures of traffic) handled by the telephone system. Included in the TS category are common switching facilities in the local central office ("end office"), interoffice trunking that interconnect several end offices either directly or via an intermediate switching point, and the costs associated with intermediate or "tandem" switching systems used to route calls.

Universal Service - a policy objective that calls for maximum residential basic exchange service penetration.

Universal Service Fund - a revenue pool established by the FCC and funded through the Carrier Common Line Charge (CCLC) that is designed to help defray unusually high subscriber line costs experienced by certain small, usually rural local exchange carriers. See also *High Cost Factor.*

Wide Area Telecommunications Service (WATS) - a bulk-priced long distance telephone service that uses a dedicated (as opposed to "common") type access line but still uses switched access to connect the subscriber's end office to the interexchange carrier's Point of Presence at the "closed" or originating end of the call. WATS calls are terminated over Common Lines like MTS calls. "800 Service" is another form of WATS, except that the service is furnished on an *incoming* basis. Calls are thus originated over a common line and terminate at the "closed end" over a special 800 Service access line. See also *Dedicated Access Line.*