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Advanced Telecommunications Infrastructure Policies

A Comparative Analysis

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1. Introduction

State governments are typically the largest consumers of basic telecommunication (voice and data) service within their states. This position allows them a great deal of flexibility in selection of private networks, and bargaining power with local exchange carriers (LECs) and interexchange carriers (IXCs). There have been differing responses by states in their infrastructure choices, each with differing financing demands and structures. Although each state has its own goals that it seeks to meet with telecommunications, there are a few objectives that continue to appear in new policy initiatives in various states. These are: enhancement of economic development through new jobs and industries that provide a higher per capita income level; increase of universal service, providing access to all potential consumers in the state; and *efficiency* in the provision of service, partially by limiting infrastructure duplication. In addition, there are pragmatic goals of connectivity between state agencies and other public service agencies, such as education and health care providers.

This paper reviews and illustrates different approaches to managing telecommunications infrastructure growth. The purpose of this paper is to identify and classify states' current policies that impact the growth, maintenance, and development of advanced telecommunications infrastructure in order to help states identify and manage the challenges and critical issues resulting from the growth of this emerging technology.

2. Methodology

This study was conducted in several steps to ensure that appropriate inputs from legislative bodies, telecommunications providers, and regulatory agencies were considered. Preliminary information was requested from states' Telecommunications Director's Offices

(or equivalent) and utility regulating body. Requested information included strategic infrastructure plans for state and government networks, financing methods, current and pending legislation, and stimulus programs for private sector investment in advanced telecommunications infrastructures. This study concentrated on the 20 states' located in the Central and Midwestern United States.

In addition to direct requests for information, statutes and session laws from each surveyed state were reviewed. This information and other documents obtained from each state were analyzed for discernible policy priority patterns. Policies were classified and matched with their apparent goals and reported results of those programs. Additional telephone contacts were made to states with pending or proposed plans, to determine their current status and to discuss the relative successes and failures of different implemented plans. All gathered information was grouped by type of initiative. Major themes and objectives of state telecommunications were then identified as a primary framework within which any other incentive must exist.

3. Network Classification

During the last three years, at least 30 states have initiated identifiable activity to address infrastructure modernization. These states' implementations range from almost completely state-owned and maintained networks to competitive and deregulated private markets that serve the government as their major

consumer of telecommunications services. The different infrastructures can be classified into three non-mutually exclusive groups:

- 1) state-controlled, operated, and used; and a separate private-owned, operated, and used infrastructure;
- 2) state-owned infrastructure, but used by both state and private sectors; and
- 3) privately owned infrastructure, used by both state and private sectors.

3.1. Separate State and Private Infrastructures

Most states have passed legislation prohibiting private traffic on a state network. Although there seems to be efforts to eliminate this restriction, based on this rule, states that choose to maintain a government network must also maintain an essentially parallel network for the private sector. This approach presents no conflict between the use of the infrastructures. There is, however, a duplication of resources to support separate public and private network infrastructures.

3.2. State-Owned Network Supporting Public and Private Traffic

A few states have decided that the immediate provision of advanced telecommunications services is in the public good and have moved to build the required infrastructures able to support both public and private needs. The state then owns and operates the infrastructure, but public and private sectors share the resource. Although duplication of resources is limited with this approach, there are difficulties in establishing parallel disparate rate structures for public and private access and maintenance of the infrastructure. The current study revealed no examples of states that have completely moved to this model, but there are states with near-term plans to establish conforming infrastructures.

3.3. Private-Owned, State and Private Used Infrastructures

The third infrastructure classification exists to some extent in all surveyed states. In this category of networks, private companies own and operate the infrastructure, but both public and private sectors share the resources. Similar to the previous approach, there is limited duplication of resources, however, the state has no direct control over access, upgrades, and maintenance, except through their influence as a major consumer.

4. Funding Methods for Enabling State-Wide Infrastructure

Methods for enabling the development or improvement of essential state infrastructure must be in place, and may be classified into three non-mutually exclusive groups:

- 1) direct funding through tax revenue or bond issuance;
- 2) enabling or encouraging private monopolies which are required to support the desired infrastructure; and
- 3) encouraging marketplace competition.

The economic method of choice depends largely on the type of service required and the risk of providing the service. A prudent telecommunications infrastructure plan includes budgeting for long term

maintenance and upgrades, in addition to the initial capital costs. Funding choices by the states or the selection of a another enabling financing structure may differ for the initial required investment and ongoing operation and maintenance. Some states have used direct funding to support initial stages of infrastructure development, then moved toward monopoly regulation for continuing operation of the basic infrastructure and services, and finally advocated marketplace competition to stimulate the progression of advanced technologies.

4.1. Direct Funding

As with other major infrastructures, such as highways, there may not be a clearly sufficient payback to compel a private investor to risk the required high capital entry cost. One method for attaining the public good of such infrastructures is for government to finance the initial construction, and either continue to operate it at additional funding risk, or turn it over to a private operator. "Direct" state funding may take several different forms such as through general appropriations of tax revenue and user fees levied on those people and agencies benefiting from the interconnectivity, imposing taxes on another item, such as cigarettes or gambling, or through bond issuance.

4.2. Monopoly Regulation

In lieu of state funding for infrastructure or ongoing maintenance, an allowance for a monopoly provider may be sufficient incentive for large private investment. There are two primary approaches of monopoly regulation with which states have initiated modernization of their infrastructure. The first is an earnings-based regulation, in which carriers are guaranteed a reasonable rate of return on their investment, with excess profit funding infrastructure upgrades; and the second fixes an allowable range of rates for each service, allowing companies to increase profits by becoming more efficient, in exchange for company-specific agreements to upgrade their infrastructure or provide public services.

4.3. Competition

Once the basic infrastructure is in place to provide service deemed necessary to the general populous, state financing and monopoly allowance may not provide the proper incentives for innovation and technological advancement, as does open competition. Incentives for private investment in telecommunications infrastructures in a competitive environment can be regulatory or non-regulatory. Regulatory incentives include a tiered approach to regulatory reform, which bases the level of regulation or treatment in a market on the amount of competition or the size of participating companies. Deregulation is another way that states are encouraging competition through regulatory changes. Non-regulatory incentives include the creation and use of a 'universal fund', and a system of social compacts. In addition to using these approaches to direct competitive efforts toward telecommunications *advancement*, states also may encourage *compatibility* between networks in these same ways.

5. Options Summary

Descriptions of programs designed to meet a variety of goals in different states have been reviewed in this paper. This section summarizes options that have been used by other states and achieved reasonable success. As the technological environment continues to change, state government must adapt and impose proper stimuli to achieve and maintain its goals in the public interest. These are presented as non-mutually exclusive options to consider at the state level as federal legislation evolves and technology progresses.

5.1. Tax Incentives

Direct monetary benefits, such as tax credits and initial regulatory flexibility, provide the most tangible incentives for telecommunications providers to seek technological innovation and extend the reach of their

services. Similar benefits may be offered to current providers who propose implementation of major upgrades to their infrastructure's support of non-basic services.

5.2. Universal Service Fund

The maintenance of a universal services fund (which is a fund intended to provide affordable basic telecommunications service to all potential consumers in a state) will enable the state to achieve parity with the national average basic service penetration rate. The common structure is for all providers to pay into the fund on the basis of an identifiable metric of their service income. When a provider receives a request for service which will require substantial investment to provide, they make application to the managing body of the fund to subsidize that line with the proceeds of the general fund. A general fund may also be established to provide grants for upgrading infrastructure to provide service in excess of basic service, but that is considered to be in the public good.

5.3. Alternative Regulation

Alternative regulation offers different plans by which companies may opt out of rate of return regulation, in exchange for providing some service in the public good. Usually this option is available only for larger providers who can afford to make a substantial up-front investment to establish a fixed rate for service, allowing them to increase profits through operational efficiencies. However, medium and small companies may be offered what might be termed a 'scaled rate for service' which would establish a rate based on expected rate of return.

5.4. Competition

Alternate regulation may also be used to phase in competition to telecommunications services. Like regulatory issues, competition must be applied differently, based on the size of providers to protect against predatory pricing and improper subsidies between traditional service boundaries. Competition implies duplicate infrastructures, however, regulations can be established that allow competition without completely duplicated infrastructures.

5.5. Expand Knowledge and Awareness

Increased knowledge of available telecommunications services and available options will increase demand for certain services, making their implementation by existing providers more feasible. Consumer knowledge will guard against predatory pricing schemes, telecommunications will be given a prevalent position and acknowledgment during legislative rule-making and town-hall meetings will help gather and spread gather information, and will further increase interest in telecommunications modernization and its application.

6. Conclusion

State governments should consider the impact of any proposed solution on the *overall* vitality of publicly available communications networks. A multi-agency workgroup can help develop and coordinate a set of 'non-price' criteria to be used in major state telecommunication network procurement. The building or leasing of dedicated 'private networks' for state government which bypass the existing public networks, or cannot be interconnected with such networks, imposes future development difficulties. When considering contracts, 'the big picture,' rather than immediate departmental needs, takes precedence. Assistance in deploying enhanced network facilities to smaller communities, ability of interconnection with other elements of state's infrastructure, adherence to standards, contribution to universal fund, impact on current jobs, economic and community development, and how well the state vision is supported, ideally drives telecommunications legislation. This approach guides the state toward a single, superior, interconnected infrastructure, rather than a collection of incompatible networks, potentially unable to meet future goals.

References available upon request from first author