



Government's Role in Deploying Advanced Telecommunications Infrastructure

CATALYST versus OWNER OPERATOR

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THE ISSUE IN QUESTION

Across the United States, Canada, and Australia, I have witnessed and participated in the debate over the appropriate role for state and provincial governments in the development of an advanced telecommunications and information technology infrastructure for enabling their communities to effectively compete in the global information economy. The debate arises principally because of the traditional role that government has played as a provider of the critical enabling infrastructures (transportation routes) of the industrial economy.

The issue of the state as owner and operator has become even more complicated in the United States as the drive for "smart highways", and the growth of new competitive telecommunication network providers have increased. A number of state transportation departments, the traditional owner-operators of a state's transportation systems, see smart highways as an opportunity to gain control of yet another right-of-way, and to gain access to what they view as "free telecommunications" for their state. Telecom network providers see the existing highway right-of-ways as a quick and low cost option for deployment of their new network backbones, and an opportunity to negotiate exclusive right-of-way privileges to the exclusion of other competitors.

One of the driving principles of this debate is the belief by most state executive, administrative, and legislative leaders that their communities are lacking in adequate telecommunications infrastructure. Economic development strategists have told them that a robust telecommunications infrastructure is critical to their state's future economic viability in a global information economy. These government leaders have come to believe that the only way to get an adequate infrastructure in place is for the state itself to invest in one. In their view, existing private sector network providers have proven that they are unwilling to provide advanced telecommunication services equitably to both the rural as well as the urban areas of their state. As a result, some state leaders become convinced that the leveraging of their state's ownership of highway rights-of-way is an opportunity to address this alleged inequity.

The concept of the state as a telecommunications owner and provider becomes even more tantalizing, when the carrot of "free telecommunications" is dangled in front of the eyes of state leaders. By granting a right-of-way access to competitive carriers, some states have negotiated the granting back of a portion of the digital fiber route for state use. Some states use these "free fibers" as an opportunity to build out their smart highway projects, and to enable internal state information traffic to more affordably flow across in-state toll calling areas. However, other states have used these free fibers as an opportunity to enter the telecommunications business in competition and at the expense of private network providers.

THE REST OF THE STORY

The reality of this position is that the very act of state ownership is a direct contradiction of the behavior characteristics essential to a vibrant, viable, and connected information economy. State ownership and control of network infrastructure is an economic disincentive to the equitable development of a state's information and telecommunications infrastructure. Infrastructures such as these have proved to be discriminatory in utilization and access.

Some states argue that the telecommunications infrastructure serving their state is inadequate for addressing state agency, corporate, and individual citizen requirements. We have discovered in our work across forty-seven states and provinces in the



United States, Canada, and Australia that this is not the reality. If a state takes the time to document the telecommunication network resources currently present in their state, they will generally find more than enough available high speed infrastructure to serve rural as well as urban communities. If every state develops a GIS inventory of available networks they could be shocked at the duplication of existing network investments. The problem is that these infrastructures are owned by competing network providers, or individual major government and private users, and are not connected. They are "silo networks" serving "silo interests". Instead of investing in more redundant infrastructure, states would be wiser to invest their time, energy, and resources in the development of policies that encourage the partnering of private and public sector network resources to establish a statewide private sector owned and operated shared use multimedia telecommunications network.

Governments should encourage the development of network consortia among traditional and non-traditional network providers across a state. Unfortunately, most state governments do not realize the degree of advanced network deployments that have already taken place in their state. This perception of network infrastructure investment gaps is perpetuated by government's view of connectivity as represented by the largest local exchange carriers present in their state. In contrast, states such as Kansas, South Dakota, and Minnesota already enjoy significant investments in advanced telecommunication network deployments through new competitive carriers formed by small locally owned rural cooperative and independent telephone operating companies. Firms such as KINI in Kansas, SDN in South Dakota, and MEANS Telcom in Minnesota are offering the most advanced technologies in the country to the most rural communities in their states at competitive rates. These network provider consortia were formed in response to the lack of services being made available to rural communities by large local exchange carriers. These consortia serve as models for aggregation of investments by multiple private sector companies, which address the needs of a state, without the necessity of the state going into the telecommunications business.

Agency administrators may argue that a state owned/operated infrastructure will be within 10-15 miles of 80% of their state's population. The problem with that statistic is that 60% of most state populations are centered around metropolitan areas, which excludes a significant segment of rural communities from participating in the information economy. When laid out against existing private sector network infrastructures, 80% of the new state network infrastructure is being installed along population paths already served with similar technology solutions; a zero sum gain. This state overlay does not address the need for a choice of wired and wireless network solutions seamlessly connected to address the needs of difficult remote populations, where traditional infrastructure solutions are potentially ineffective.

Administrators who promote the idea of a state controlled infrastructure fail to address critical questions of life cycle costs and the risk of technology obsolescence. Most of the fiber routes negotiated back into the hands of a state are not activated with photonic transmission, or electronic switches, hubs, and routers to direct voice, image, and data connectivity. This equipment needs constant maintenance and upgrades to handle ever-increasing connectivity demands and improvement in services to maintain market parity. This costs dollars - real dollars.

When the state invests in a network instead of mandating a standard of connectivity performance, the state locks itself into a technology solution path that will be quickly outdated. The state ultimately bears the risk of technology obsolescence, and the costs of continuing upgrades, which typically fall victim to budget constraints. We have worked with many communities which bought the story of free fiber, to only learn subsequently that there is no free lunch. In fact, they have learned that ultimately their costs are higher, their headaches are greater, and their customer satisfaction is lower. This is the very reason that large private sector users of telecommunication services, such as IBM, Kodak, and others, are outsourcing rather than continuing to invest in and manage their own telecommunication networks.

From our experience with numerous states and provinces, we have observed that aggregation of public and private sector telecom application uses creates a large incentive for private sector interests to invest in advanced technologies and broader network deployment of these technologies for all areas of a state or province, not just the metropolitan areas. In contrast, when a state isolates its use from the uses of the rest of the marketplace, technology advancements are not as readily



deployed. In many rural regions of a state, the largest economic drivers of telecommunication networks are public sector users. Once a state removes this economic base from the private network provider community, the economic incentives for further investments dry up. When a state removes its purchasing power as a leverage resource for use by the entire state, citizens lose; and a state's future economy will suffer.

What is troubling about the debate of state ownership and operation of networks is that it is occurring at the very time that economic opportunities for remote rural communities are dramatically increased. For the first time in 75 years, rural locations can participate in the growth of the new information economy as long as access to advanced telecommunications infrastructure is available to support private and public sector user interests on a shared use basis. Work and workers will choose to locate wherever in the world a community offers the most connected, effective, and efficient quality of life. Therefore a state's policy toward the development of a network infrastructure strategy becomes critical to the economic future of its own communities.

The real economic benefits, that derive from having access to a robust and ubiquitously deployed statewide telecommunications infrastructure, are those that result from shared use behavior. It is estimated that a reduction of up to 70% of traditional government transaction costs can be enabled by on-line public to private sector connectivity. This does not include the significant productivity improvements that would be enjoyed by citizens and businesses conducting business on-line with a state. Beyond these benefits, we know that developing a shared use connectivity strategy can yield a fivefold increase in governments access to connectivity resources for at least 20% less than they currently pay for telecommunication services. Resources expended on ownership, maintenance, and customer service operations of a telecommunications network divert state resources from focusing on achieving the significant benefits of a connected economy for its taxpayers.

Therefore, when a state focuses primarily on investment in network infrastructure, that focus is misguided. The big dollar gains come from changing a state's industrial age budget and spending patterns to those more appropriate to an information economy. This requires an investment in policy change not infrastructure.

A LEADERSHIP DIRECTION

The essential role for government should be that of visionary catalyst for a comprehensive human, policy, and technology infrastructure which supports their citizens' ability to access and appropriately function in the new information economy. This means state governments need to:

Develop the information readiness and understanding of their citizen, administrative, and elected leaders.

Act as a catalyst for development of open technology standards at the most appropriate advanced levels. These standards need to promote seamless connectivity among all public and private sector multimedia telecommunication networks regardless of ownership, user location, or available communication access resource.

Bid out highway right-of-ways to multiple network providers on a non exclusive basis to address short term toll area connection costs, to implement smart highway strategies, and to accelerate private sector, not public, advanced telecommunication infrastructure build outs.

Promote the development of collaborative network consortia among traditional and non-traditional network providers (energy utilities, local telephone companies, rural telephone companies, cable companies, Internet service providers, private networks, etc.). This promotes the development of privately funded shared use infrastructures serving all geographic communities.

Leverage the state's network and network application purchasing power to enable high-speed access on an equitable basis across rural and urban communities through private sector network providers.



Become the model for aggregation of user demand across agencies and governments. This encourages collaboration as the dominant behavior underlying the state's economy. This aggregated demand will provide the economic support for increasing the capacity of private sector shared use networks.

Establish the state as a model of 24x7 anytime, anywhere service delivery for all citizen services.

RELEVANT STATE EXAMPLES

The issue of state versus private sector control has been addressed in a number of states over the last several years, where ViTAL Resources, Inc. has participated in the debate. Each state has learned from the experiences of those that preceded them. Each of them recognized that their state had a significant role to play in enabling the development of an advanced telecommunications infrastructure for their state. They also understood the fundamental relationship between this infrastructure and their state's economic future. In addition, they recognized their leveraging role as the single largest telecommunications customer in their state, and how their decisions as a customer could hinder or promote information age connectivity for all.

The lessons of the past have taught many government leaders that state ownership and control of telecommunications infrastructure does not result in a shared use telecommunications resource. It is yet another technology silo that serves some, not all. Governments have repeatedly demonstrated a costly capacity to build and operate multiple wired and wireless networks within the same state. As you will note from the lessons they learned sequentially, their role as a visionary catalyst of collaborative behavior and shared connectivity rather than that of a champion for state owned/operated infrastructure deployment has become a significant priority. They choose not to repeat the costly mistakes of the past.

The Iowa Communications Network (ICN) has been publicized widely as both proof of the value of a state owned network deployment, as well as justification for why state control is detrimental. The real truth is that the state did not originally want to own the network. Iowa, in the early 1990's, set forth a visionary direction for the deployment of a shared use, statewide, digital broadband high-speed network to serve all citizens and government locations. It was to be built and owned by Iowa's existing network providers. However, Iowa's large telecommunications companies refused to provide the service, and attempted to stop the bid for a service. They then attempted to stop the deployment of the new network, when several carriers agreed to provide the service to the state. Iowa became a deployer of networks rather than an enabler of private sector network deployment, which had been its first choice. The problems of commercial and consumer access to a government-controlled network have become evident, as reported in the New York Times on December 24, 1998. Iowa is now struggling with significant decisions regarding commercial access, as well as the requirement for additional investments in technology upgrades necessary to keep its network current and viable.

A few years later, North Carolina built its policy framework around the experiences of other states like Iowa, and decided that its role would be that of a network enabler and major anchor tenant. The state established a policy framework for the deployment of a shared use broadband infrastructure to be built throughout the state by dozens of private sector network providers. The state established a policy of equitable access for all rural, suburban, and urban communities. As a result, the state became the coordinator of services for state and local community network applications. By establishing an open standard for the first ATM based statewide network in the United States, North Carolina enabled significant information based economic development to occur throughout the state. Estimates by Wharton Econometrics (WEFA) attribute an increase of 44,000 new jobs and \$2.5 billion to the state's economy from this network known as the North Carolina Information Highway (NCIH). Private sector investments in this network have approached \$500 million.

In Maryland, the state's Information Technology Board, and governor followed North Carolina's lead in establishing a statewide standard for the deployment of a high-speed digital broadband network. Learning from North Carolina's early adopter experience, Maryland chose to develop a different network services pricing structure. Maryland decided to use its



aggregating power to establish a common standard of service and price that was available to all users on a statewide basis. Network providers could then bill users directly rather than go through the state. This saved significant costs, and allowed the network to be priced as a shared use, not a state controlled network. The Information Technology Board also worked with state regulators to introduce the first applications tariff in the United States, which resulted in a common access price for all users regardless of location. By a significant margin, this tariff became the lowest in the country at that time. Maryland has enjoyed significant job growth related to the deployment of this network, especially in rural communities. Over 3,000 new information-based jobs were directly attributed to this network investment in the first two years of its deployment.

Pennsylvania is currently building on all of these early models to launch what we believe to be the ideal model today for enabling the deployment of a comprehensive state-of-the-art telecommunications infrastructure for the entire state and its citizens. Over the last three years, the governor and the state CIO have coordinated a major effort to develop a statewide policy for deployment and use of advanced telecommunications infrastructure. Pennsylvania decided to withdraw from the business of controlling and purchasing networks, and move to a purchase-of-services model driven by applications that would transform the state's economy and the delivery of government services.

To effect this strategy, the governor issued an executive order terminating all telecommunications and information technology contracts in the same month. Prior to this termination, the state launched a six-month comprehensive discussion with leaders across the state to determine the best approach for procuring advanced telecommunication services statewide. In conjunction with this discussion, the University of Pittsburgh created the first GIS mapping of all public and private technology infrastructures in the state. They discovered that the technology gaps that were thought to exist in the most rural areas of the state did not exist. In fact, there was an abundance of network infrastructure; no one had bothered to encourage the linkage of these silo infrastructures into a statewide plan.

A procurement is now underway for the private sector development of a statewide high-speed digital multimedia broadband network. The state will have access to this network as a service. The network will connect the state to all private and public sector entities in Pennsylvania. The procurement is being used as a leverage to make such services available to all citizens on a highly competitive commercial basis. This investment will be private sector funded, and the network will be managed by a consortium of private sector network providers. State services are first use applications, but the network is available to all public and private application users. Pennsylvania is a visionary enabler rather than an owner operator of that state's new and advanced telecommunications infrastructure.

CONCLUSIONS

The fundamental behavior of the new information economy is collaboration. Connectivity is the essential enabler of this new economy, which ViTAL Resources terms a Connected Economy. A connected economy is the fruit of a viable information-ready community, which has learned that connectivity without collaborative behavior is a recipe for economic failure. A competitive connected economy requires that all individuals, not just some, be connected. This means the connectivity enabler of a state's economy, the telecommunications infrastructure, must enable collaboration of all private and public resources across a state regardless of geography, or economic sector.

Such connectivity, by definition, must enable ubiquitous network collaboration among network providers; seamless connectivity across and among all state and local government agencies; equal access by and between all users, economic sectors and levels of government.

Government needs to develop and communicate a vision of how public services will be delivered in an information economy. Governments need to work with community leaders to define a vision of how citizens, businesses, and governments will work together to transform their state into a globally competitive information ready community.



Policy leaders and agency managers need to develop an understanding of how they will function differently to support a connected information economy. We recommend the creation of a leadership-training institute that helps these leaders move from an industrial to an information age management and resource allocation mindset.

Governments must be in the business of encouraging collaboration rather than separate ownership and control of resources. This requires a breaking down of the traditional separation between levels and agencies of government, and between the private and public sector. This is especially true with regard to the multiplicity of unconnected networks owned and separately operated by government entities today within the same state.

A plan for enabling ubiquitous connectivity for an entire state should be developed by a consortia of public and private sector community leaders that will define how a state connects its economy for the benefit of all.

Government should act as a major catalyst for the development of a community coalition model, that promotes information age awareness in its citizens, and helps the state define a plan of connectivity to enable a connected economy. The new information economy moves and changes in dramatic ways in time frames measured in web years (3 month cycles), not fiscal or calendar years. Most governments do not have a process that enables them to act to change direction in web years.

The United States Telecommunications Act of 1996 was meant to encourage private sector, not public, investments in telecommunications infrastructure. The appropriate role for state government is that of a catalyst to increase private sector network investments. More importantly, government leaders can best serve their citizens by focusing their time on the development of a statewide information readiness strategy, not a public sector network infrastructure investment plan.

Francis J. Knott (CEO; Vital Resources) provides a vision, a model, and a process for embracing the new information economy. His expertise has enabled communities, governments, corporations and individuals around the world to take control of their own destiny and become economic winners.

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