



# A Dynamic Perspective on Government Broadband Initiatives

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## INTRODUCTION

Debate over government provision of broadband has generated many of the usual arguments over the pros and cons of government service provision. On the one hand, such initiatives might make broadband more affordable and hasten its adoption. On the other hand, they could also generate significant costs for taxpayers and stunt incentives for cost containment. Such arguments commonly occur when governments consider direct provision of electricity, gas, water, roads, and many other services that tend to be provided by monopolies that invest in long-lived assets. Less extensively discussed, however, are some unique challenges that arise because broadband is a new, fast-changing technology available from competing suppliers. Policymakers need to consider some unique

problems when a government enterprise enters a dynamic market such as the provision of Internet services.

Traditionally, infrastructure like water systems, gas distribution and electricity distribution has involved a fixed investment that was very large compared to the ongoing operating cost. The technology of the infrastructure itself changed relatively slowly. As a result, local governments could usually invest in what appeared to be the best technology at the time without having to worry much about whether they chose the right technology. Pricing and selling the service was relatively easy. Most people need water, heat and electricity, and the service providers usually had a monopoly. Long asset lives and slow technological change made long depreciation schedules possible. Service providers could be reasonably confident of recovering their capital

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costs over a long time period.

However, these static monopolies differ significantly from services like Internet provision, which are dynamic due to their fast-changing technology and variety of services. Unlike heat, water and electricity, Internet service is not viewed as a need by most people. This elasticity of demand also makes the market dynamic, as companies continually change their offerings and prices to appeal to a variety of consumer desires. This dynamic competition upsets the tranquil conditions prerequisite for successful government provision of a service.

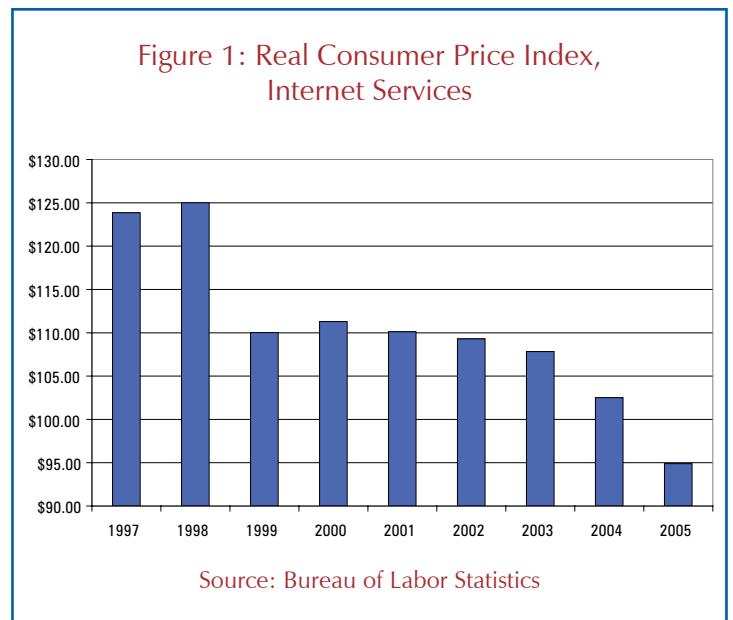
## ISSUES FOR DECISION-MAKERS

Scholarship on dynamic competition suggests seven new issues that are likely to be significant in municipal provision of Internet service:

- **Competition:** Unlike a monopolist, an enterprise that faces competition cannot count on a captive market. In many cases, government-sponsored broadband will have to compete with incumbent firms, such as cable, telephone, and wireless companies that already have a substantial head start. After reviewing many cities' actual experience with cable and broadband enterprises, research concludes that an assumed penetration rate for a municipal system of more than 10 percent in the first year, or 20-50 percent in subsequent years, appears highly unrealistic in most cases. A wireless system might expect to serve about 25 percent of the residential market and 10-20 percent of the business market. The only exceptions might be small communities serviced only by expensive alternatives, or municipalities willing to commit to very large subsidies for their broadband systems.
- **Performance Competition:** Competitive businesses seek to continually improve performance—or even develop new aspects of performance that were not previously thought capable of improvement. Speed is perhaps the most measurable aspect of performance. Comparing prices and services offered by government-sponsored Internet provision to those in the private sector, the prices and performance of existing government systems are inferior to those of existing private systems. An effective government-owned competitor must be

prepared to offer a price/performance combination that a significant number of consumers will prefer to those offered by competitors. If government ignores performance competition, it could end up offering a fairly plain service appealing only to customers who want relatively slow broadband speeds, and may not be willing to pay much for it. In effect, government would be seeking an unattractive market niche similar to the one now occupied by the dialup Internet access firms. While such an approach might be attractive as social policy, it is unlikely to pay for itself over the long term and would likely require ongoing subsidies.

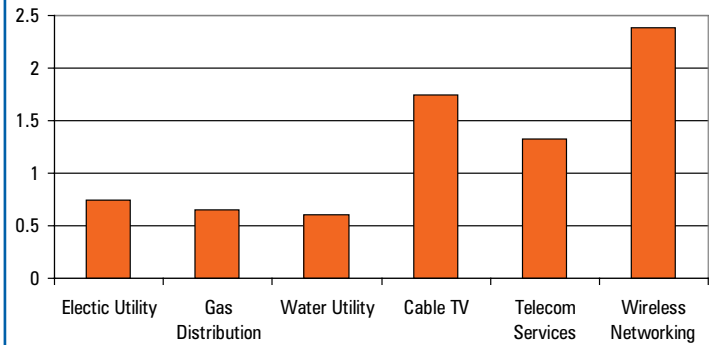
- **Continuous Improvement:** One indicator of the extent of change is the pace at which prices of goods and services fall as technology improves, costs fall, or competition intensifies. This has occurred frequently in the market for Internet service, as well as in related or analogous markets such as wireless communications, telephone equipment, and telecommunications services. Real consumer price indices for wireless, telephone equipment, and long-distance service have fallen even faster—by 45-65 percent (see figure below). If recent experience is a guide, government broadband operations will need to be prepared to continually improve in the future if they want to keep pace with private sector competitors.
- **Technological Change and Lock-In:** “Lock-in” occurs when an initial decision gives one technology a slight



edge, then sets in motion a process which leads that technology to dominate the market. If the technology that gets locked in is truly the superior technology, then there's no harm done. But if an inferior technology gains a temporary edge in market share, some scholars argue that it might remain dominant even though it is inferior. Discussions of lock-in often focus on numerical examples in which the early adopters of technologies choose the technology that creates the biggest payoff in the short term. An alternative technology, however, creates greater value over the longer term, when there is a larger number of adopters. The market gets locked in to the inferior technology due to the decisions of the early adopters, and often has to rely on subsidies to stay afloat when better technology is available elsewhere. Governments that want to get into the broadband business already face several technology choices. Government broadband plans should squarely address the potential for lock-in and explicitly evaluate whether subsidies would give an inferior technology an artificial boost.

- **Obsolescence:** In a dynamically competitive market, networks become obsolete faster. Technology improves more rapidly, and as a result capital investment becomes obsolete more quickly. Business plans for government broadband enterprises need to assume faster depreciation rates, and concomitantly higher prices, than have traditionally been used for government utilities. For example, a workable plan for municipal Wi-Fi needs to assume that revenues will not just cover operating costs plus interest, but also recover the initial capital outlay in three to five years.
- **Risk:** Financially, investment in a dynamic field such as Internet provision is less of a “sure thing” than a conventional government monopoly. That means the cost of capital should carry a higher risk premium than normally considered appropriate for government enterprises. But just how risky is it? Comparing risk levels shows clearly that investments in electric, gas, and water utilities have involved much less risk than investments in firms that sell broadband or wireless data services (see Figure 2). Electricity, gas, and water are precisely the types of static, monopolized industries where governments have traditionally invested.

Figure 2: Utility Risk Levels (Beta Coefficients, Where Stock Market = 1)



Data Source: Aswath Damodaran, [http://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/datafile/Betas.html](http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/Betas.html)

In terms of risk, broadband is a whole new ballgame. Investing in broadband is much riskier than investing in the overall stock market. Nevertheless, some governments have financed broadband initiatives as if they were traditional, low-risk investments in infrastructure that provides necessities. A government enterprise that faces an artificially low cost of capital is more likely to waste the public's money by “investing” in capabilities that produce little value for customers, or do so only after an excessively long time.

- **Uncertainty:** A private business firm's shareholders bear uncertainty as well as risk. The prospect of additional, higher returns entices them to bear that uncertainty. The fact that uncertainty affects shareholders' financial fortunes gives them strong incentives to seek out management that will exercise sound judgment. The most likely method would be to organize the enterprise as a for-profit company, with explicit expectations from the owner (the government) that it be successful. The most credible way governments make these types of commitments is by enacting a plan to privatize the enterprise. But in this context, a privatization plan would beg the question of why the government is getting into the broadband business to begin with! For government broadband enterprises, taxpayers bear the uncertainty in their role as the ultimate owners. At a minimum, therefore, effective accountability requires that government broadband initiatives should have accountability

and transparency for taxpayers at least as good as that which publicly held companies must have for their shareholders. These transparency measures may not be sufficient to make government managers as accountable to uncertainty-bearing taxpayers as corporate managers are to uncertainty-bearing owners. But it is difficult to see how accountability is possible without them.

While many broadband initiatives require some type of public sponsorship or investment—either by government or by government-owned entities—a recent twist appears to offer the public a much better deal. In some cities, such as Philadelphia and San Francisco, private firms have proposed to build Wi-Fi networks at no cost to taxpayers. There is nothing inherently wrong with proposals for free or privately subsidized Wi-Fi. However, governments need to realize that rights-of-way and light poles are valuable assets, and access to these assets would bestow a significant competitive advantage on any firm selected to use them.

Any local government that grants one Wi-Fi provider an exclusive right to use right-of-way and poles risks distorting competition in whatever markets are generating the revenue stream that will subsidize the Wi-Fi service. The only provider of advertiser-supported Wi-Fi allowed to use city light poles, for example, could likely charge a higher price for advertising than if there were competing providers of advertiser-supported Wi-Fi. A monopoly that gives away Wi-Fi to build demand for other services it might sell to Wi-Fi users might be able to charge a higher price for these other services than it would in the presence of other Wi-Fi competitors. For this reason, local governments should beware of granting one Wi-Fi provider exclusive access to public assets, even if the Wi-Fi service itself is free of charge to users. At a minimum, decision-makers should assess whether exclusive access would distort competition in the markets for other goods and services sold by the Wi-Fi company.

The factors outlined above need not imply that government-provided broadband is a bad idea. However, no plan for government-sponsored broadband should be considered complete or responsible unless it addresses many factors. Government faces the daunting challenge of entering a market where technological change is swift, the future is uncertain, and competitors' actions are unpredictable—a playing field fundamentally different from the stable, predictable utility markets that have traditionally attracted public investment.



## CONCLUSION

The factors outlined above need not imply that government-provided broadband is a bad idea. However, no plan for government-sponsored broadband should be considered complete or responsible unless it addresses the factors outlined in this report. More specifically, any plan that adequately takes dynamic competition into account should answer the following questions:

- Who are the competitors?
- Do the projected penetration rate and market share reflect realistic assumptions about current and potential competition?
- What cost or quality advantage will the government broadband service have over competitors?
- What performance attributes matter to customers?
- How will the government service compare to competitors on these performance attributes?
- How rapidly have broadband prices fallen in the market where the government enterprise will compete?
- How rapidly can prices be expected to fall in the future?
- How rapidly have performance attributes improved in



the market where the government enterprise will compete?

- How rapidly can performance be expected to improve in the future?
- How will the government enterprise keep pace with competitors' price reductions and/or performance improvements?
- What safeguards are necessary to ensure that the government enterprise competes with the private sector strictly on the merits?
- What safeguards are necessary to ensure that any benefits the government enterprise receives due to its public nature do not distort competition in related markets?
- What safeguards are necessary to ensure that private broadband competitors obtain access to public rights-of-way on equal terms with the government entity?
- What safeguards are necessary to ensure that political considerations or subsidies do not let an inferior technology dominate the market by giving it a head start?
- What is the economically useful life of the capital deployed by the government enterprise and the appropriate depreciation rate?

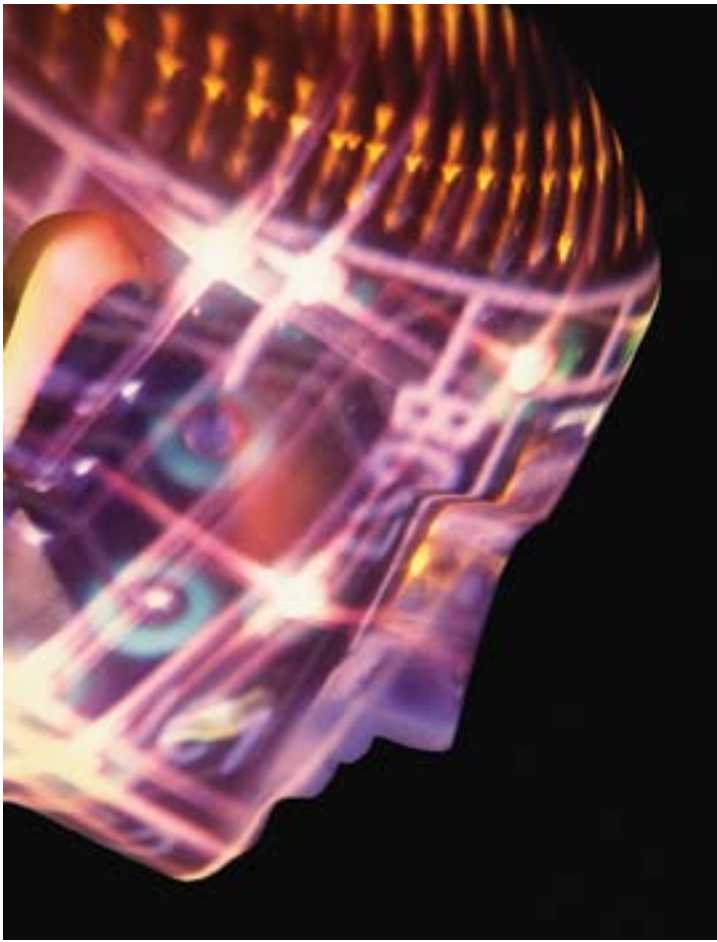
- What cost of capital reflects a realistic depreciation rate on the assets?
- What cost of capital accurately reflects the risks that the government enterprise will face in a dynamically competitive market?
- How will the incentives of the enterprise and its employees be structured to foster sound judgment in the face of significant uncertainty about competition and future technological developments?
- How will any subsidies be quantified and transparently disclosed to the public?
- What public benefits is the enterprise intended to produce?
- How will these benefits be measured and communicated to the public?
- How will financial, performance, and public benefit data be gathered, verified and validated?

These questions may appear daunting. They are no less daunting than the challenge of actually entering a market where technological change is swift, the future is uncertain, and competitors' actions are unpredictable. Such is the nature of dynamic competition. If the questions seem unfamiliar to policymakers, that's one more bit of evidence that the nature of dynamic competition is fundamentally different from the stable, predictable utility markets that have traditionally attracted public investment.

## ABOUT THE AUTHOR

Jerry Ellig has been a senior research fellow at the Mercatus Center at George Mason University since 1996. Between August 2001 and August 2003, he served as deputy director and acting director of the Office of Policy Planning at the Federal Trade Commission while on a leave of absence from the Mercatus Center. Dr. Ellig has also served as a senior economist for the Joint Economic Committee of the U.S. Congress and as an assistant professor of economics at George Mason University.

Dr. Ellig received his Ph.D. and M.A. in economics from George Mason University in Fairfax, VA.



## RELATED REASON STUDIES

*Spinning its Wheels: What Other Cities Can Learn from iProvo's First 18 Months of Municipal Broadband*, by Steven Titch, Reason Foundation Policy Study 348, August 2006, <http://www.reason.org/ps348.pdf>

*The Municipal Broadband Compact*, September 2005, <http://www.reason.org/wifibroadband/municipalbroadbandcompact.shtml>

*Questions Public Officials Should Ask About Government Broadband Services*, September 2005, <http://www.reason.org/wifibroadband/broadbandquestions.shtml>

*Spectrum Privatization: Removing the Barriers to Telecommunications Competition*, by David Colton, Reason Foundation Policy Study No. 208, July 1996, <http://www.reason.org/ps208.html>

*On the Frontier of Deregulation: New Zealand Telecommunications & the Problem of Interconnecting Competing Networks*, by Milton Mueller, Reason Foundation Policy Study No. 177, May 1994, <http://www.reason.org/ps177.html>



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