

INTRODUCTION, EXECUTIVE SUMMARY AND RECOMMENDATIONS

In any time and any region, business location decisions are based on the availability of a trained workforce, access to markets and proximity to essential infrastructure. In the 21st century affordable broadband access is no longer simply a competitive advantage to a region's economy but infrastructure that will dictate its viability.

Reliable broadband access is critical in a business' primary location and reliable cellular telephone access is also increasingly necessary throughout the growth center and region in which the sales and delivery network of a business operates. The safety of the communities and businesses operating in any region is also dependant upon reliable communication among emergency services personnel. Thus a primary premise of this study is that broadband and cellular telephone access are essential for economic development and public safety.

There are significant gaps in the availability of broadband and cellular telephone access in Washington County. High speed Internet or broadband access is available in certain locations and innovative solutions are growing in usage and distribution. Slow dial-up connectivity remains the primary means of Internet access for many small businesses and most individuals.

Cellular phone access in the service centers of Calais and Machias is reliable in some places. In Eastport however it is non-existent in the central business district. It is also very patchy throughout the network of transportation corridors linking these service centers and their businesses to a regional workforce and customer base.

This study documents the status of the broadband and cellular telephone infrastructure in Washington County using surveys of users, GIS mapping and interviews with industry representatives and emergency services personnel. It documents on-going efforts to improve the reliability, coverage and extent of these services and includes recommendations for further such improvements. It also provides example lease arrangements, ordinances and siting criteria to assist municipalities and others to install infrastructure in an efficient, cost effective manner that does not intrude on the cultural and natural landscape that is so important to Washington County.

The Washington County Communication Committee has completed an evaluation of its communication system and is working on development and replacement of core infrastructure to upgrade the emergency communication system. However this effort has not been coordinated with the needs of the regional economy.

The study seeks to forge connections and synergies among economic development and emergency services goals and implementation efforts. It envisions that Washington County will be equipped and marketable for information technology, biotechnology, financial services and other information-age industries. Service centers will be able to induce growth in their historic downtowns. Businesses will be able to make site location decisions by interacting with informed local regulators and a region that has overcome

the limitations of its geographic isolation. Site location and design decision will be informed by the wealth of experience throughout the country on concealment of wireless facilities to protect the cultural heritage and natural beauty of Washington County.

Surveys: Two random surveys of Washington County residents and businesses were conducted to assess the type and reliability of existing broadband and cellular telephone service in Washington County. Questions included whether respondents used broadband and cell phone service, what type of service they use or whether it is available at all and who provided the service. Questions also sought input on respondent's level of satisfaction with the service, the reasons for their satisfaction or dissatisfaction (reliability, speed, cost, etc.) and whether improvements in service would contribute to greater use of the service, business or educational advancement and/or job creation.

Each survey was mailed to 3000 random Postal Customer addresses (15% of Postal Customers in Washington County/survey) and 250 businesses (from a database of 715 businesses in Washington County). The high speed Internet survey yielded an 11% response rate 31% of whom were businesses. The cellular telephone survey yielded an 18% response rate, 26.3% of whom were businesses.

Conclusions and Recommendations from Survey Results: Improvements in cellular telephone and high speed internet access are important for businesses but improvements in broadband access are of greater importance. This conclusion is seen many times in the written comments. It is also seen in the higher positive rate of response in the high speed internet survey to the question about whether improvements would be an important factor that influenced a decision about opening a business in Washington County.

RECOMMENDATION

Investments in any telecommunications infrastructure should include and/or support new equipment that increases high speed internet capacity.

Only 2 percent of cell phone users are very satisfied with their service and 79 percent are somewhat satisfied or very dissatisfied. The primary reasons (68 percent) are coverage and reliability. Improvements in cellular telephone service would support economic development but are of primary importance for personal and public safety.

RECOMMENDATION

Investments in cellular telephone infrastructure should be closely coordinated with investments in infrastructure to improve emergency response and public safety. This should include leveraging of funding sources from economic development, homeland security and emergency response.

The motivation of broadband providers to provide modestly priced services like DSL is based strictly on the potential for return on investment within approximately two years. The majority of high speed internet survey respondents (68%) are only somewhat satisfied, somewhat dissatisfied or very dissatisfied with their Internet service and the reason is speed (48%). If high speed internet were available 64% of respondents would

order it right way or within six months. There is thus strong evidence that investments will be rewarded by subscription by users.

RECOMMENDATION

The public sector should recognize that market demand is strong and provide financial assistance with start up ventures and on-going business development efforts to improve high speed internet access.

Infrastructure Assessment: Available infrastructure for broadband and cellular telephone access in Washington County is changing daily. During the study (November 2004 – March 2005) a new tower was constructed in Perry to provide wireless broadband service. It will also host a new repeater for one cellular telephone provider. Several business opportunities for additional broadband delivery opportunities are also under development.

In order to integrate traditional infrastructure with telecommunications requirements, GIS maps were prepared depicting where traditional infrastructure that supports economic development intersects with regional services, land designated for commercial and industrial development and telecommunications infrastructure.

Entirely new maps were created documenting existing broadband capacity and actual reception of cellular telephone service. The latter map confirms the written comments of survey respondents: there is no reliable signal in roughly 40% of the primary travel corridors of Washington County and only a weak signal in about 15% of the same area.

When asked to identify the single most important constraint on providing public safety services in Washington County the Local Emergency Planning Committee (LEPC) unanimously agreed it was gaps in cell phone and radio service.

To address these gaps in service the study examines existing FCC licenses for telecommunications services in Washington County. We found that the private cellular telephone service infrastructure is installed on an almost completely different set of structures (towers, poles, etc) from the infrastructure that serves the public emergency service sector. Part of the reason for this stems from widespread municipal refusal in the past two decades to engage the private sector or even to allow towers on their land. All existing FCC licenses for telecommunications infrastructure in Washington County are reproduced in the Appendices. The study has distilled a table from these many duplicate entries to summarize over 75 sites (68 existing, 8 potential new sites) that could be examined for the mutual benefit of the public and private sector to improve cellular and radio telecommunications coverage.

Conclusions and Recommendations from Cellular Telephone Infrastructure

Assessment: It will take further examination of capacity and engineering feasibility at these 75+ sites to realize improvements in cellular telephone and emergency radio service. It will also require communication and cooperation among private and public sector personnel. Wireless broadband internet providers can also benefit from use of this

existing infrastructure. The scale at which they provide service is in smaller sectors than cellular telephone coverage. Improvements in cellular infrastructure could provide co-location opportunities for wireless broadband internet access. Further analysis specific to wireless broadband coverage is also required to first map wireless internet service gaps and then to determine the feasibility of using existing infrastructure or to construct new towers.

RECOMMENDATION:

Examine capacity, engineering feasibility and costs of co-location of facilities on public and private sites identified in Table 2 to improve cellular telephone and radio coverage in Washington County. Prioritize sites for infrastructure improvement with results.

RECOMMENDATION:

Coordinate, where feasible, co-location of cellular telephone, emergency services and broadband wireless infrastructure on new and existing sites.

RECOMMENDATION:

Review and revise County and Town polices to allow and encourage private use of public sites.

One site in Washington County specifically in need of upgrade is at the County Courthouse in Machias. According to the Washington County Communications Committee existing facilities on top of the Machias County Court House are at capacity. Private sector inquiries to locate antennas on the Court House were refused by the Washington County Commissioners due to concerns over the hazards associated with putting any more structures on top of the building. The existing public safety infrastructure is also old and needs upgrading. Construction of a new tower in the vicinity could address several complimentary efforts including:

1. removing a mass of antennas from a historic building,
2. upgrading equipment and capacity at the Regional Communications Center,
3. offering lease space to the private sector for enhanced cellular and wireless Internet opportunities, and
4. spreading the funding opportunities across homeland security and economic development agencies currently targeting rural areas for improvements in telecommunications services

RECOMMENDATION:

Develop a site for a new tower to replace/enhance wireless facilities on County Court House in Machias. Build for co-location to support emergency services and regional economic development goals.

Conclusions and Recommendations from Broadband Infrastructure Assessment:

There are numerous current initiatives to expand high speed internet services in Washington County. They include wireless internet service, several DSL choices, cable, T-1, and satellite. Many are innovative and specifically target the so-called “last mile” of service in rural Maine. Most residents still use dial up services that are not considered

“high-speed” and tie up their phone lines in the process. Many are also unaware of the variety of choices that are already available and on the horizon for expansion. Businesses contacting the local Chamber of Commerce are also unaware of available high speed services and most assume that it will not be adequate for their needs.

Indeed, during the study (February, 2005) the PUC launched an interactive map on their web site to provide the public with information about the types of broadband Internet access available according to the town where they live. At the time of publication (May, 2005) data for Washington County included only incomplete descriptions of cable service (no provider name), incomplete listings of DSL providers and included none of the satellite or wireless providers. Washington County providers are in the process of updating that information.

RECOMMENDATION:

Washington County high speed internet service providers should aggressively make their service areas known to the PUC and link this information to local economic development web sites (Sunrise County Economic Council, Eastern Maine Development Corporation, all local Chambers of Commerce).

Discussions with the Advisory Committee acknowledge that 100% coverage of high speed internet in Washington County, or indeed rural Maine, is not a realistic goal. There will be better service and more choice in population centers with concentrated development. It is not realistic to expect high speed internet access that enables telecommuting to the far corners of the earth from every remote cabin in the woods at the same price as you would pay in the center of Calais, Machias or Eastport. More remote areas will have fewer choices and may have to pay more for it. This is consistent with both the cost to get the service to those locations as well as State policy expressed in the Planning and Land Use Regulation Act (AKA the Growth Management Law). Namely, public investments should concentrate development efficiently in areas with existing infrastructure and services. Any resident has the right to choose to live further from those services but they should expect to pay a little more for their choice.

Cellular and ISP Providers Interviews: After compiling the results of the GIS mapping and the survey we conducted several interviews with providers of broadband services in Washington County. We only interviewed one provider of cellular telephone service. Questions were asked of private sector service providers in an interview format.

Conclusions and Recommendations from Private Sector Interviews: Interviews included questions and issues about both high speed internet issues and cellular telephone access. However the bulk of the responses concern high speed internet.

The most significant barriers to entry are associated with initial capital costs for start up or expansion ventures. Costs are associated with interconnection fees to Verizon, lack of DSL functionality on Verizon lines, affordable lease rates on existing towers,

construction of new towers, and installation of wireless reception equipment on individual homes.

Providers acknowledge that while there is a limited customer base there is also very low market saturation, high demand and a variety of available innovative solutions. Thus, the most important need to fill the gaps in service is funding for initial capital costs. All providers, high speed and cellular, recognize the need to share infrastructure to spread the capital burden. High speed internet providers need and anticipate fast growth in subscription with initial capital development assistance. Smaller firms developing new services are targeting high population areas and dispersed rural areas (the so-called “last mile”) with low market saturation. Most are optimistic about growth potential and see Washington County as a state and national test area for rural broadband deployment. Frustration over the lack of gap financing in rural areas to “jumpstart” the sector is very common.

RECOMMENDATIONS:

Develop and expand public and private funding sources to assist with initial capital equipment costs to develop high speed internet capacity in rural areas that will extend service beyond existing infrastructure constraints.

Explore subsidies for bulk purchase of wireless reception devices on individual residences and businesses.

Facilitate sharing of infrastructure to spread capital costs across public and private sector and across telecommunications service needs (broadband, cellular, radio).

State Level Efforts to Improve Service: The need to coordinate public and private infrastructure is essential statewide to support public safety and as an engine of economic growth. Several components of the Governor’s Connect Maine are summarized including recent creation of the PK-20 Telecommunications and Technology Infrastructure Board, the Broadband Infrastructure Board and the Telecommunications Infrastructure Steering Committee to prioritize, coordinate and implement the necessary enhancements and accessibility of wireless telecommunications and broadband technology.

Recent and on-going legislative initiatives are also summarized with some recommendations for change and improvement.

LD 1128 (voted ought to pass by a divided report on May, 2005) directs the State Planning Office, in conjunction with the PUC and the Department of Economic and Community Development, to study the economic, technological and funding issues associated with municipalities providing wireless internet services to their communities. The Advisory Committee for this study (see Appendix A) is composed of several private service providers of high speed internet services as well as professional staff who provide technical assistance to rural municipalities in the areas of land use planning and regulation, economic development and downtown revitalization. All agreed that

municipalities are not appropriate providers of wireless internet service for several fundamental reasons:

1. Municipalities, particularly rural communities where there is the greatest lack of reliable high speed internet service, often have insufficient or only enough capacity to conduct the administrative and regulatory requirements of their own affairs at current property tax levels.
2. Delivery of wireless internet services requires technical expertise that is rarely, if ever, among the qualifications of town clerks, administrators or managers.
3. As this study has described in detail, the private sector is already ready, willing and competent to provide wireless internet services to rural communities. What they lack is financing to get over initial capital investment needs.
4. Research in the Pittsburgh region found that most municipalities do not pose significant obstacles for telecommunications infrastructure deployment due to fees and regulation as many had assumed. However, the study found significant obstacles at the municipal level because, even at the highest levels, officers of the municipality do not understand basic telecommunications issues. Many did not know if or how much, the municipality received from cable franchise agreements, whether the municipality had any regulations for telecommunications infrastructure, or whether telecommunications providers were even working in their area.

Therefore this study believes it an extremely poor use of State funds to conduct the study proposed in LD1128.

RECOMMENDATION:

Focus state studies and capital investments on the private sector who have demonstrated a technical and entrepreneurial ability to provide high speed internet services.

LD 1440 (voted to be carried forward to the second regular session of the 122nd Legislative session) would create a Maine Internet Access Authority within the PUC to encourage collaboration among providers, local governments and economic development groups. It would also require towns to accommodate wireless providers on their buildings for little or no cost, set up a State matching fund to encourage innovative solutions for providing high speed internet service and require publication of fees. This bill will be taken up in the next legislative session presumably with the input of the Governor's Telecommunications Boards and Telecommunications Infrastructure Steering Committees.

LD1440 also identifies the Committee on Utilities and Energy as the authority to set membership, powers, duties and goals of the proposed Maine Internet Access Authority. Given the importance of internet access to economic development, a Joint Committee should include the Business, Research and Economic Development Committee as well as the Committee on Utilities and Energy. In addition emergency services personnel in Washington County report extremely high lease rates in order to place emergency radio equipment on privately owned towers. Thus any state mandated requirement that wireless equipment be allowed on municipal structures should be balanced by a similar mandate that accommodates the public sector.

RECOMMENDATION:

Given the importance of internet access to economic development, the authority to set membership, powers, duties and goals of the proposed Maine Internet Access Authority should rest with the Joint Standing Committee on Utilities and Energy and the Joint Standing Committee on Business, Research and Economic Development.

Any state mandated requirement that wireless equipment be allowed at little or no cost on municipal structures should be balanced by a similar mandate that accommodates public sector needs for emergency services infrastructure.

Create the State Matching Fund to encourage and implement creative Internet access technologies as soon as possible. Include sufficient public funds for front end capitalization of private firms to implement business models that are already in place.

Models for Municipal Licensing, Regulation and Management: A central assumption in the State's efforts to reach the so-called "last mile" of broadband users is the need for the public and private sector to work together to improve coverage for public safety and private use. Indeed the state currently owns only two towers to support the existing radio frequency system. End-users are very good at cooperative partnerships that create public leases on private infrastructure. However Input from emergency personnel and the private sector indicate considerable price ranges exist to lease tower space for telecommunications equipment.

The Department of Conservation owns land where towers are located. They adopted a policy to "permit limited development of selected, state-owned land under its jurisdiction for electronic communication that has significant benefit to the public." While their purpose is not to open all sites or to sell space they seek to meet the needs of those who need them. The policy includes direction on co-locations, standards and lease conditions. There are several parcels of State-owned land in Washington County designated specifically as "Communication Sites" with potential for improving cellular and broadband coverage. These are listed in the study.

RECOMMENDATION:

Include evaluation of Department of Conservation "Communication Sites" for improving cellular telephone and wireless broadband service in Washington County as part of evaluation of sites noted in Table 2.

Model Ordinances. Several models ordinances are evaluated for applicability to rural areas of Maine. Except for the Maine Model Telecommunications Ordinance, available on the State Planning Office web site, all are reproduced in Appendix K.

RECOMMENDATION:

Several ordinance models are provided for Washington County communities to use to develop Wireless Facility Siting Ordinances. Cooperation among Washington County communities to establish a common set of standards for all communities and wireless

facility providers is recommended. Ordinances should include response times for co-location inquiries, standards of “reasonable” cost and at least 5 future collocations per site.

Concealment of Infrastructure and Historic Structures and Scenic Landscapes

There is a need to hide some telecommunications equipment in Washington County to balance the growing heritage and nature-based tourism economy with the wireless and cellular telephone access needs of residents and other types of commerce.

Wireless siting regulations describe efforts at concealment as “stealth” or “stealth technology”. The means of hiding telecommunications equipment is varied and creative. Stealthing may utilize, but does not require, concealment of all components of the wireless facility”.

There are numerous examples around the country and in the state of disguised sites that accommodate telecommunications equipment and fill gaps in existing service. Given the proliferation of wireless infrastructure on church steeples that has occurred in the last decade, the study also provides available assistance to churches on the legal and tax implications of choosing to allow this equipment.

Dozens of examples are provided from around the country including photos and web sites for further reference.

Potential sites include churches in Eastport, Perry, Robbinston and Dennysville, renovation and replacement of antennas on the Machias County Court House, lighthouses in Lubec and elsewhere along the coast, water towers in Eastport, Woodland and elsewhere. There are also undeveloped and pristine areas with service gaps that could benefit from the “emergent white pine” types of tower structures shown in the report.

RECOMMENDATION:

Include concealment and “stealthing” requirements in any ordinance or facilities siting efforts that occur in areas of particular historic significance (historic districts) or scenic beauty (undeveloped hill tops, vistas) and seek funds that will assist with any additional costs associated with these efforts.

RECOMMENDATION:

Recognize the importance of co-location of facilities to limit their total number but, where it will protect cultural and scenic resources, allow a denser array of non-intrusive structures.

Funding Sources for Infrastructure Investment. Funds available for investment in telecommunications infrastructure are various and growing, particularly in underserved areas and communities. Several examples are included in the study. Some can be directly applied to infrastructure. Others may provide leverage when the project goals (the use to which the infrastructure will be put) align with the grant program. Still others are funds that may in future assist in the effort.

RECOMMENDATION:

Coordinate multiple sources of funding and site feasibility analysis to fill gaps in coverage by construction facilities that serve the multiple objectives of economic development, emergency services, homeland security and cultural/scenic protection.