

**Northern Michigan and Eastern Upper Peninsula
Knowledge Economy Strategies Project Co-Learning Report #1**

**Broadband Policy Recommendations for
Local Governments in Michigan**



**Michigan State University
Center for Community and Economic Development**

in cooperation with the

Northeast Michigan Council of Governments

Alcona, Alpena, Cheboygan, Crawford,
Montmorency, Oscoda, Otsego, Presque Isle

Northwest Michigan Council of Governments

Antrim, Benzie, Charlevoix, Emmet, Grand Traverse,
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Broadband Policy Recommendations for Local Governments in Michigan

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A digital version of this report is available at
KnowledgePlanning.org

EDA Northern Michigan and Eastern Upper Peninsula Knowledge Economy Strategies Project Co-Learning Report Series

In October 2008, the Michigan State University Center for Community and Economic Development (CCED) initiated a project with the support of the U.S. Department of Commerce Economic Development Administration (EDA) to develop innovative economic development strategies with three Northern Michigan regional planning partners: the Eastern Upper Peninsula Regional Planning and Development Commission (EUPRPDC), Northeast Michigan Council of Governments (NEMCOG), and Northwest Michigan Council of Governments (NWMCOG). The goal of the project is to create new knowledge-based economic opportunities in the regions and to successfully compete in the global knowledge economy.

An assessment of each region's Comprehensive Economic Development Strategy (CEDS) identified strengths, weaknesses, and opportunities, and helped each region to develop their collaborative learning (co-learning) plans. Co-learning plans are designed to provide regional planners and their stakeholders with relevant new knowledge, focus, and capacity. This new knowledge and capacity serves as a platform for regional planners and stakeholders to create innovative regional economic development strategies focused on competing in the global knowledge economy. By understanding the dynamics and demands of global knowledge economy forces, regional leaders can better align their regional investment priorities with those demands.

This report was produced as part of the development of a co-learning plan in response to a request for information on broadband access by the EUPRPDC.

Disclaimer

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Introduction

Broadband development and deployment was identified by the Eastern Upper Peninsula Regional Planning and Development Commission (EUPRPDC) in its submittal February 13, 2009 of proposed co-learning plan modules as an area to address by the Northern Michigan Knowledge Economy Strategy collaborative learning process. To start the broadband development co-learning process, the MSU Center for Community and Economic Development (CCED) project team met with Ron Choura, Professor of Telecommunication, Information Studies and Media; Tom Muth, Professor Emeritus of Telecommunication, Information Studies and Media; and Susana Woolcock of the state Public Service Commission on March 5, 2009.

The purpose of the meeting was to identify strategies that could address rural broadband development and related data collection issues. The CCED project team's efforts to obtain broadband coverage data had been unsuccessful as corporate service providers are not required to make broadband coverage data public. This is a critical data issue for rural areas with both unserved and under-served areas. The American Recovery Act of 2009 (ARA) includes funding for collecting data on broadband coverage, but there are questions about how effective this data collection program will be in providing quality data and how long it will take.

As a result of the March 5 meeting, Professors Choura and Muth drafted the following discussion of local broadband policy recommendations in 12 topics. This discussion is based on the 2005 report entitled The Broadband Services Report authored by Choura and Muth and Ron Siegel, Jr. and Mark Levy.

Rural broadband policy issues are framed in large part by geography. The study notes the geographically dispersed population of Northeastern Michigan and the lack of a current or planned transportation system that provides reasonably-efficient travel across the region. "Therefore, greatly improved telecommunication infrastructure is critically needed to enhance the economy and quality of life in the NEMCOG region," according to the authors.

Twelve recommendations are discussed below and include the following: 1) Provide Public Education/Training in Telecommunication Services; 2) Develop Strategies to Provide Lower Cost Broadband Services; 3) Mobilize Aggregate Demand for Improved Infrastructure and Services; 4) Provide Additional Broadcast Off-the-Air plus Public Access; 5) Require GIS Mapping of all Modifications of Public Right-of-Ways; 6) Require Wireless Interoperability among First Responders; 7) Maximize the E-Rate Fund; 8) Improve Communications with Providers and Require Conduit Installations; 9) Require Joint Use Underground Infrastructure; 10) Connect to the National LAMBDA Rail Network; 11) Provide Crisis Management Systems For Each County and Multi-county Collaboration; and 12) Provide Full Electronic Access to Government Functions.

Recommendations

The following 12 policy recommendations are from the 2005 Broadband Services Report prepared by the MSU Site for Information and Telecommunication Experimentation (M-SITE) in collaboration with the Northeast Michigan Council of Governments (NEMCOG) and its stakeholders. That report provides a description and analysis of telecommunication and broadband development in northeast Michigan. These recommendations are presented here for consideration by local government leaders in Michigan and current and future broadband service providers and customers. These recommendations are intended to address regional infrastructure needs associated with the development of the knowledge economy in northern Michigan and other parts of the state and Midwestern Heartland.

1. Provide Public Education/Training in Telecommunication Services

Insufficient knowledge of telecommunication services generally exists in the region. Local governments and providers must assist broadband marketing and/or the education of residents through resources like fairs, forums, focus groups and informational training. With new technologies and new communication solutions improving our way of life, it is critical to provide the proper marketing and education to community residents. Not only will they learn about the technologies and services available to them, they will be able to take advantage of these amenities to improve their lifestyles. Local governments should play a major role in the development and delivery of information, training, and public information ventures in their communities. Internship programs with local schools and businesses could provide hands-on experience in various technology applications.

2. Develop Strategies to Provide Lower Cost Broadband Services

If new broadband ventures and development are to succeed, implementation must be affordable for the general population. Residents will not pay for services and technologies priced higher than those offered in urban areas. A large percentage of residents in Northeastern Michigan are seasonal homeowners, and would likely want the same services as they have in their permanent homes. Local governments should assist in the development and implementation of cost-effective strategies to ensure competitive pricing for services in the area. Rural users need to have input into network planning, development, types of services offered, and cost recovery. Non-profit cooperative providers provide one approach through which long term sustainability can be achieved.

3. Mobilize Aggregate Demand for Improved Infrastructure and Services

Local governments and economic development authorities (e.g., MSU Extension) must identify funding and develop strategies to improve infrastructure, public information, and the aggregation of private and public sector demand. Pressure must be exerted by residents, businesses, and public agencies (e.g., Emergency Services) on providers to improve their infrastructure and market their services throughout the region. If a community effectively demonstrates its willingness to pay for services, providers will more likely build infrastructure and offer quality services. If providers refuse to offer needed services, regional interests should consider building their own system to meet their needs.

Encouraging infrastructure providers to obtain loans from the Universal Service Fund/High Cost Fund is important because a large segment of capital costs will come from outside the region. Grants should also be included as a long-term funding option. Using the Fund will reduce customers' service costs. Creating a new entity that can obtain funds from this source and provide services to some un-served areas is also feasible.

4. Provide Additional Broadcast Off-the-Air plus Public Access.

Local governments should work to develop new low-power radio and television broadcasting. New low-power broadcasting options are available from the FCC for schools and other entities that use services like Instructional Television Fixed Service (ITFS). New content or re-broadcasted material can be transmitted at modest cost. Such transmissions can provide training in information technology through media such as talk radio and re-broadcasted shows like Tech TV. Local governments should encourage schools to broadcast TV such as the Discover channel, Tech TV, or Learning Channel over ITFS. Sub-channels can be used to power WI-FI networks for broadband access. Low-cost transmission can be broadcast stations such as Michigan State University's WKAR and 870 AM. Over-the-air advertising can be made available, and students can generate advertising content at low costs. Such content via AM/FM and ITFS can provide useful educational content for information technology and a vast array of other uses for both the private and public sectors.

In the US, cable television providers are required to fund local organizations that supply training and access to media technology and cable distribution on local cable systems. Congressional intent was to give communities opportunities to produce community-based programming and address local issues in this electronic medium. These are public air waves after all. As originally conceived some 35 years ago, public access television was strictly connected to the cable TV technology of that time. Times have changed. Many public access organizations now offer television, radio, and the Internet in its spectrum of communications. Public access television is now just one type of **PEG** access, that is, **Public, Educational, and Governmental**, the three traditional access channels in municipal cable TV operations. Local areas should develop the capacity to record and archive meetings and public events. The events could be pod casted or broadcast on radio or television over low-power systems.

5. Require GIS Mapping of all Modifications of Public Right-of-Ways

Geographic Information Systems (GIS) should be used to help aggregate demand and facilitate better communication for emergency service providers in the area. Standard EMS GIS systems should be used to better serve regional needs. Local governments should require GIS mapping of all utility infrastructure in public right-of-ways. Utilities should be required to provide detailed GIS overlays of disturbed areas before being allowed to make any modifications to public right-of-ways. An ongoing telecommunication GIS system should be maintained by a local government agency. This type of system would assist the tracking of infrastructure and services. This will also assist with the selection of providers and service availability for the public.

Providers should be required to regularly update and post information on the web. Local governments would then have data on telecommunication services being used, the areas covered, and development needs.

Student internships should be used to maintain the GIS systems. GIS development and maintenance provides outstanding opportunities for students to learn about information and communication technologies (ICT) and services offered by various providers. These internship opportunities can spawn employment in the region and increase knowledge of telecommunication systems that can be used in economic development

The GIS information should be stored in ways that the templates can be shared with other areas or aggregated into a Google-like map on a national basis.

6. Require Wireless Interoperability among First Responders

Improved wireless services like ‘push-to-talk’ and ‘radio-to-radio’ technologies are needed to provide better EMS communication in the region. Current wireless capabilities are not sufficient to effectively serve EMS needs and resident populations. Local governments should concentrate on implementing a highly-reliable, universal wireless communication system for all EMS services. Uniform contracts with specific providers, or self-imposed provisioning by local government, should be implemented to provide these services.

7. Maximize the E-Rate Fund

The E-Rate program offers government funding to help libraries and schools foster advanced technology systems. Libraries can receive discounted prices on technology that range from 20-90% below market price. The area serviced and patrons’ incomes determine the level of assistance. Urban areas are more likely to receive higher discount rates. The E-Rate fund could help the region sustain a broadband backbone infrastructure.

8. Improve Communications with Providers and Require Conduit Installations

Local governments must work to encourage provider communication and improve the telecommunications infrastructure. Local governments should coordinate water/sewer and road projects with telecommunication projects to reduce costs and expand facilities. Public programs should be established to insure constant communication with providers. All projects that ‘open up the ground’ should be required to install plastic conduit for future telecommunications use.

9. Require Joint Use Underground Infrastructure

When planning water, sewer, curb, sidewalk and road construction projects, local governments should require installation of conduit wherever possible. Installed conduit can be resold or leased in the future to telecommunication providers or local businesses for fiber optic and other advanced broadband services. Different sharing contracts can be designed for right-of-way space.

This effort should help launch government-owned Fiber-to-the-Premises networks in conduits - PVC or similar conduits in public right-of-ways, such as roads, bridges, water, sewer, gas, steam, railroads, and airports. These conduits would also hold all other service providers.

10. Connect to the National LAMBDA Rail Network

The region should build toward making available a network that allows users to be on the National Lambda Rail (NLR) network. The foundation of the NLR infrastructure is a ‘dense wave division multiplexing’ (DWDM)-based national optical footprint using Cisco Systems’ 15454 optical electronic systems, with a maximum capacity of 40 and 32 wavelengths per fiber pair, respectively. Each wavelength can support transmissions at 10 billion bits per second (10 Gbps).

This optical system is deployed nationally across approximately 15,000 route-miles of dark fiber that NLR has obtained through Level 3 Communications. Four NLR wavelengths have been implemented using 10 Gigabit Ethernet LAN PhY (physical layer). This technology and architecture were previously limited to metro-area networks. NLR can also support the SONET (Synchronous Optical NETwork) Technology employed in traditional telecommunications networks, if needed. The initial wavelengths provide a national 10 Gbps IP network to support inter-networking and end-to-end transport protocol experiments; the first-ever national switched Ethernet experimental network with circuit-like 1 Gbps services; a quick-start facility for new research projects in support of data- and computation intensive science projects; and a

redundant sparing capability in the event of channel-specific failure. Additional wavelengths are activated across individual segments of the infrastructure as needed. A more detailed description of NLR services and a researcher's guide are available. Nearly a dozen research projects are already using NLR services. <http://www.nlr.net/>

11. Provide Crisis Management Systems For Each County and Multi-county Collaboration

A primary goal of local public telecommunications policy should be the interconnection of first-responder communication systems to effectively respond to crises and natural catastrophes. During a crisis, many different first responders including policemen, firemen, first-aiders, utility service personnel, local security personnel, and crisis managers are involved. Different responders have different needs and responsibilities. Different responders also have different communication technologies. Public agencies should seek to bridge the different communication technologies used by various first responders like mobile phones, radios, phones, walkie-talkies, satellite phones, and even computers.

One solution is based on a new Cisco technology, Ipics (Internet Protocol Interoperability and Collaboration System). This technology uses Voice Over IP (VoIP) and has the potential to create live group communications. A hardware server is used which can be deployed in mobile command vehicles or included in tactical communications kits. Managers can manage all first responders through a computer connected to the server.

A technical description of the technology can be found at http://www.cisco.com/en/US/prod/collateral/ps6712/ps6718/prod_brochure0900aecd80352c7e.html.

The first goal of this technology is to cut functioning costs of agencies' coordination and crisis management:

- Agencies can eliminate the expense of purchasing radios for office personnel by connecting cellular phones and laptops.
- Enables communications interoperability at a fraction of the cost of replacing existing radio systems.
- Avoids the expense of unnecessary upgrades to existing radio networks by capitalizing on existing communications networks and devices.

The second goal is to improve cooperation, communication and information sharing:

- Extends communications interoperability and delivers voice, video, data, sensor and messaging information.
- Improves incident notification and messaging.
- Increases flexibility and simplifies processes.
- Allows dispatchers and incident commanders to manage operations and resources from one or more locations.
- Unifies command and control.
- Maintains a detailed audit log of all communications activities related to an incident.

The third goal is the result of a better crisis management. Indeed a faster reaction and better coordination between stakeholders will:

- Protect material assets of manufacturers, plants, farms to avoid stopping work because of severe property and material damage.
- Allow all businesses to resume normal activity since electricity power grid, telecommunication architecture recover faster.
- Protect firms which deal with hazardous raw material or wastes in case of incident

☐ Allows continuity of operations of important businesses (banks, telecommunications).

12. Provide Full Electronic Access to Government Functions

All levels of government should have web portals that provide information and receive information from constituents. Web sites should provide digital public squares with links to information on everything from crime to parking to tourism. They can provide maps of free wi-fi hot spots, public library finders, leaf-collection schedules; even a widget to view live snow-plow progress. Local governments could sponsor contests with local schools and interested residents to generate better web-based applications. Contests entries from residents offering applications could give area residents Web and cellphone access to crime reports, pothole-repair schedule, snow plow schedules, and other data or needed services that would lower the cost of government and improve the quality of life. Local governments should also work with local businesses to assist online points of sale for e-commerce.

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