OFFICE OF BROADBAND DEVELOPMENT

Report to the Legislature
as required by Minnesota Statute § 116J.39, Subd. 5

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Minnesota Department of Employment and Economic Development

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Introduction

During the 2013 session, the Legislature created the Office of Broadband Development within the Minnesota Department of Employment and Economic Development (DEED)[1]; that statutory language can be found at Minn. Stat. § 116J.39 and 116J.391.

Minnesota Statute § 116J.39, Subd. 5 requires the Office of Broadband Development to submit a report that contains, at a minimum, the following information:

1. An analysis of the current availability and use of broadband, including average broadband speeds, within the state;
2. Information gathered from schools, libraries, hospitals, and public safety facilities across the state, determining the actual speed and capacity of broadband currently in use and the need, if any, for increases in speed and capacity to meet current or anticipated needs;
3. An analysis of incumbent broadband infrastructure within the state and its ability to spur economic development;
4. An analysis of the degree to which new, additional, or improved broadband infrastructure would spur economic development in the state;
5. A summary of the office's activities in coordinating broadband infrastructure development under section 116J.391;
6. Suggested policies, incentives, and legislation designed to accelerate the achievement of the goals under section 237.012, subdivisions 1 and 2;
7. Any proposed legislative and policy initiatives; and
8. Any other information requested by the legislative committees with jurisdiction over broadband policy and finance, or that the office deems necessary.

Much of the work in 2013 focused on taking the steps necessary to establish the Office of Broadband Development within DEED. The data reflected in this report was obtained largely from the Governor's Task Force on Broadband and the supporting contract with Connect Minnesota/Connected Nation. That contract is funded by federal American Recovery and Reinvestment Act (ARRA) funds and had been administered by the Minnesota Department of Commerce until state broadband activities were consolidated within DEED in 2013.

Analysis of the current availability and use of broadband, including average broadband speeds, within the state

Residential Broadband Availability

Measured on a technology-neutral basis, 74.53 percent[2] of all Minnesota households have access to broadband that meets the state broadband speed goals of at least 10 Mbps download and at least 5 Mbps upload, this leaves 25 percent of households without access to service at the minimum targeted levels.

[1] Minnesota Session Laws, 2013 regular session, chapter 85 at Article 3, sections 13, 14, and 26.

[2] It should be noted that the Connect Minnesota data is collected using speed tiers established by the National Telecommunications and Information Administration (NTIA) of the U.S Department of Commerce as NTIA administers the grant program that pays for the collection of

If availability is measured exclusively for broadband service delivered by a fixed platform (e.g., wire line or fixed wireless), then 71.04 percent of Minnesota households have service available that meets the state's broadband speed goals. The fixed platform percentage is notable here because of data caps, pricing variances, and other differences are significantly different between wireless broadband service and fixed services. These differences are not addressed in statutory broadband goals.

Average Broadband Speed

The only source the Office of Broadband Development has identified that provides a statewide average of broadband speeds is Akamai; that organization measures actual broadband connection speeds rather than the services available in a given area. While this metric is important, there are significant disparities in speed levels available between urban and rural areas of Minnesota; statewide averages do not accurately reflect the experiences of all consumers across Minnesota. Akamai's [3] data (gathered during the second quarter of 2013, the most recent available) shows that the average broadband connection speed in Minnesota was 8.4 Mbps. While the average connection speed has steadily increased (for example, the average connection speed was 7.9 Mbps in 1Q13 and 6.7 Mbps in 2Q12), the average speeds in other states have also increased. As a result, Minnesota's broadband speed ranking remains in the middle, as shown in the table below:

Top Ten States in 2Q2013 in Average Broadband Connection Speed

Rank	State	2Q 2013 Avg. Mbps
1	District of Columbia	11.4
2	Massachusetts	11.2
3	Virginia	11.1
4	Delaware	10.8
5	New Hampshire	10.7
6	Maryland	10.6
7	Utah	10.3
8	New Jersey	10.2
9	Washington	10.1
10	Connecticut	10.0
…		
23	Minnesota	8.4

Current Use of Broadband

Use or adoption of broadband in Minnesota compares favorably with use nationally. Based on data gathered annually by Connect Minnesota[4], 78 percent of Minnesota adults subscribe to broadband service in their homes. In a national

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this data. Those speed tiers do not align with the Minnesota speed goals: an upload speed of 5, while meeting the Minnesota speed goal, would fall into the NTIA speed tier of at least 3 Mbps up to 5.99 Mbps. Because data is collected in a range of speed and it cannot be stated with certainty that all data in the 3 to 5.99 range is above 5, that tier is not included when determining the percent that meets the state speed goal.

[3] http://www.akamai.com/stateoftheinternet/

[4] All data collected by Connect Minnesota is available at www.connectmn.org

study of broadband adoption across the states, the National Telecommunications and Information Administration[5] found a 76 percent household adoption rate for broadband service in Minnesota. Minnesota's household adoption rate ranked eighth amongst the states in the latter study.

Broadband adoption in Minnesota does vary significantly across socio-economic lines, as shown by the following Connect Minnesota survey data:

Type of Group	Broadband Adoption Rate
Statewide	78%
Low Income	62%
Rural	71%
African-American	81%
Hispanic	77%
Other Minorities	70%
Disabled Adults	60%
Seniors	49%
Low Income with Children	78%
Low Income and Rural	56%
Low Income Seniors	32%

The overall rate of broadband adoption (78 percent) – and, particularly, the lower rate of adoption by certain socio-economic groups - has important implications for policymakers as the State moves towards providing many types of public services online.

Information gathered from schools, libraries, hospitals, and public safety facilities across the state, determining the actual speed and capacity of broadband currently in use and the need, if any, for increases in speed and capacity to meet current or anticipated needs.

Speed and Capacity of Broadband Used by Community Anchor Institutions

There is not currently a central source for comprehensive data on connectivity rates for community anchor institutions in Minnesota. In preparation for benchmarking, planning to focus state resources, and future reporting needs, the Office of Broadband Development is engaging in discussions with staff from MN.IT Services, the Minnesota Geospatial Information Office, the K-12 technology consortia, the Minnesota Department of Education, Minnesota State Library Services, and other partners on the best sources and approach to gather the necessary data to baseline current connectivity rates in this area.

As part of the State Broadband Initiative program funded by the federal American Recovery and Reinvestment Act, Connect Minnesota is also conducting direct surveys of community anchor institutions. While that data is still incomplete, the Office of Broadband Development will include this information (along with state-sourced data and analysis) in a future report.

[5] http://www.ntia.doc.gov/report/2013/exploring-digital-nation-americas-emerging-online-experience

Need for Increased Speed and Capacity

While the Office of Broadband Development will soon begin working directly with community anchor institutions to identify capacity and needs, Connected Nation has gathered preliminary data in nine states and Puerto Rico on this topic. While also incomplete, this information does provide a snapshot of how Minnesota's broadband speed and capacity in K-12 educational institutions and libraries compare with the set of states below.[6]

Estimated Percentage of Institutions with Download Speeds of 100 Mbps or Greater		
Jurisdiction	Schools	Libraries
Alaska	11%	<1%
Iowa	7%	2%
Michigan	38%	3%
Minnesota	1%	<1%
Nevada	54%	<1%
Ohio	66%	1%
Puerto Rico	<1%	<1%
South Carolina	47%	7%
Tennessee	37%	1%
Texas	23%	10%
All Ten Jurisdictions	34%	3%

K-12 educational institutions and libraries have recently received renewed federal focus. The Federal Communications Commission recently announced plans to reform the E-rate program, a part of the Universal Service program that provides subsidies for telecommunication services (including internet connectivity for schools and libraries)[7]. The agency has solicited comments from stakeholders on how the program could be best updated and improved; the parameters governing the program currently were set in 1997. President Obama also recently launched the ConnectED Initiative calling for 99 percent of American students to be connected to next generation broadband and high speed wireless. That initiative sets a speed target of 1 Gbps (and no less than 100 Mbps) in schools and libraries within the next five years. As suggested by the above table, considerable improvement in connection speeds would be necessary for Minnesota to meet the goals of the federal ConnectED initiative. Further data collection in 2014 will provide a clearer view of where Minnesota currently stands in regard to connectivity rates for community anchor institutions; that data will also provide a basis for gap analysis, recommended state investments, and appropriate advocacy efforts at the federal level.

Concerns about public safety broadband connectivity are also growing at the national and state levels. The federal FirstNet Project, a nationwide public safety mobile broadband network currently in the planning stages, will be the subject of much discussion as stakeholders consider how it might be deployed in Minnesota. The Minnesota Department of Public Safety, the Office of Broadband Development, and other partners will play a major role in

[6] September 16, 2013 comments of Connected Nation in FCC proceeding WC Docket Number 13-184. Link: Connected Nation View (37)

[7] Wireline Competition Bureau FCC Launches Update of E-Rate for Broadband in Schools and Libraries (175) FCC Launches Update of E-Rate for Broadband in Schools and Libraries (3) FCC Launches Update of E-Rate for Broadband in Schools and Libraries (3) FCC Launches Update of E-Rate for Broadband in Schools and Libraries (4)

determining how FirstNet can best meet public safety data needs as well as other potential connectivity needs as defined by the state.

Analysis of incumbent broadband infrastructure within the state and its ability to spur economic development

Broadband has frequently been called the key transportation infrastructure of the 21st Century, as important as railroads and the highway system have been in years past. Federal Communications Commission Chairman Wheeler alluded to this in recent comments: "…the new information networks are the new economy. Earlier networks enabled ancillary economic activities. The railroad, for instance, hauled coal that fired the furnaces of industry. In contrast, what today's networks haul isn't an input to a product, it is the product itself. Our growth industries are today based on the exchange and use of digital information. As such, information networks aren't ancillary; they are integral."[8] The examples that follow demonstrate a widely acknowledged fact: adequate broadband service helps create and maximize economic development opportunities.

The Greater Minnesota Partnership is a non-profit organization that advocates for economic development policies and resources that benefit greater Minnesota. The Partnership consists of businesses, Chambers of Commerce, economic development authorities, and cities and nonprofits throughout greater Minnesota. Over the course of several meetings held in nine cities in the fall of 2013, the Greater Minnesota Partnership reports that the top priorities identified by attendees were broadband and job skills. Separately, the Partnership conducted a survey of economic development officials which identified the same two areas as top issues
Impact 20/20*, a* diverse group of Northwest Minnesota leaders working to promote the region's economic success, has identified broadband as one of its three primary initiatives. The Impact 20/20 broadband task force released a report[9] on December 5, 2013, showcasing how various businesses in northwestern Minnesota are using broadband. The purpose of the study was twofold: to understand the role broadband is playing among businesses in the region and to identify and share best practices with the larger business community. The report concludes that, for many of the businesses featured, broadband access increased efficiency, decreased costs, and/or made it feasible individuals to start a business in the region in which they were raised. While the report consists of various business success stories, it also notes that the businesses "facing challenges, due to inadequate broadband service. There are many stakeholders and many levels of complexity, but policy makers and private service providers have begun to take steps to address some of the issues. Things seem to be moving in the right direction, but as the needs continue to grow, one must ask the question, are we moving fast enough?"

The Region Five Development Commission (Cass, Crow Wing, Morrison, Todd and Wadena counties) has developed a region-wide comprehensive plan.[10] That plan integrates 11 themes, one of which is connectivity/broadband. Of the others, all the themes include recommendations that require connectivity or assume connectivity will have a positive impact. Generally, Region Five has inconsistent access to high speed Internet service; some areas have virtually unlimited access while other areas have little or none. The comprehensive plan recognizes that limited or inconsistent connectivity has a negative impact on healthcare, commerce, and educational opportunities. The plan also resulted in the creation of the Virtual Highway Project. The Region Five Development Commissioner continues to develop a rural

[8] http://www.fcc.gov/document/remarks-fcc-chairman-tom-wheeler-ohio-state-university
[9] Link to report: Download a copy of IMPACT 20/20's Business Broadband Study
[10] http://www.resilientregion.org/plan/

broadband impact assessment, identify barriers to broadband deployment, and work with partners to identify and address connectivity issues.

In Austin, Minnesota, Vision 20/20 is a grassroots movement with hundreds of volunteers engaged with a variety of organizations and interests (including government, business, non-profits, and educational institutions) to improve the quality of life by the year 2020. From over 3000 ideas submitted to improve Austin, the ten final adopted ideas included a community-wide technology initiative. The goal of that initiative is to provide every home, school, and business with low-cost, state-of-the art technologies including fiber optics and wireless internet throughout the City of Austin. In the process, the initiative will increase economic prosperity, enhance educational opportunities, and heighten community safety. A broadband expert has been hired to estimate installation and maintenance costs and research business models.

The Leech Lake Band of Ojibwe (LLBO) Comprehensive Economic Development Strategy for 2014-2019[11], approved on November 12, 2013, identifies infrastructure development (including telecommunications, broadband services, and land acquisition) as its top priority. The LLBO Economic Development Division is currently investigating the feasibility of operating its own fixed wireless telecommunications/broadband company. Connectivity across the reservation would help the LLBO efficiently deliver government services (including health, education and public safety) and increase jobs.

Analysis of the degree to which new, additional, or improved broadband infrastructure would spur economic development in the state

Numerous studies have identified the economic impact that additional and improved broadband infrastructure has on economic development. A sampling of such studies is included below.

The Federal Communications Commission's National Broadband Plan[12] states that "broadband is becoming a prerequisite to economic opportunity for individuals, small businesses and communities. Those without broadband and the skills to use broadband-enabled technologies are becoming more isolated from the modern American economy." The Plan references a Bureau of Labor Statistics forecast that jobs depending on broadband and information and communications technologies will grow by 25 percent from 2008 to 2018. It also cites 2008 study from Pew that found 62 percent of American workers rely on the Internet to perform their jobs.

An Ericssson study[13] of eight Organizations for Economic Co-operation and Development (OECD) countries found that gaining 4 Mbps of broadband increased household income by $2100 annually.

The Broadband Commission for Digital Development, formed by the International Telecommunications Union, issued a manifesto[14] in late 2013 calling for broadband to be at the core of any sustainable development efforts. That manifesto also advocated for ensuring that all countries are able to participate in the global digital economy.

[11] http://www.llojibwe.org/
[12] http://www.broadband.gov/plan/13-economic-opportunity/
[13] http://www.ericsson.com/news/130918-measuring-and-analyzing-the-impact-of-broadband-on-income_244129227_c
[14] http://www.itu.int/net/pressoffice/press_releases/2013/67.aspx

In its work with the Governor's Task Force on Broadband, Connect Minnesota was asked to report on the economic impact of broadband adoption in Minnesota. Using national studies applied to Minnesota, Connected Nation found that economic impact projections (based on the most recent demographic and employment numbers) show that a 1 percentage increase in broadband adoption could result in $517 million of growth in the Minnesota economy. Benefits include:

- 8,307 jobs saved or created[15]
- $387,353,427 in direct annual income growth[16]
- $1,702,273 in average annual health care costs saved[17]
- $20,050,716 in average annual mileage costs saved[18]
- 9,643,720 in average annual hours saved[19]
- $108,106,106 in annual value of hours saved[20]
- 25,902,989 in average annual pounds of CO_2 emissions cut[21]
- $157,561 in average annual value saved by carbon offsets[22]

[15] Calculated based on findings from Crandall, Littan, and Lehr (Robert W. Crandall, Robert E. Littan, and William Lehr, "The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis of U.S. Data," Issues in Economic Policy: The Brookings Institution, No. 6, July 2007, p. 2. For a two-year time frame, this regression generated .593 as the coefficient for the impact of broadband expansion on employment. As such, this growth is calculated based on a .2965 (.593/2) annual coefficient. According to the United States Bureau of Labor Statistics, Minnesota's employment was 2,801,672.

[16] Based on a mean annual income of $46,630 in Minnesota (Source: United States Bureau of Labor Statistics, May 2012).

[17] Based on an average savings of $217 by 35% of home broadband users (source: "The Economic Impact of Stimulating Broadband Nationally," a report by Connected Nation available here: http://www.connectednation.org/_documents/connected_nation_eis_study_executive_summary_02212008.pdf.

[18] Based on 66% of home broadband users driving an average of 102 fewer miles per month because of their online activities (source: "The Economic Impact of Stimulating Broadband Nationally," a report by Connected Nation available here: http://www.connectednation.org/_documents/connected_nation_eis_study_executive_summary_02212008.pdf, valued at $0.585 per mile, the General Services Administration reimbursement rate (http://www.gsa.gov/graphics/ogp/FTR_Amend_2008_05_Order.pdf). This calculation only factors in the 78.9% of new broadband users who would be age 16 or older for the state of Minnesota (US Census, 2012 American Community Survey 1-Year Estimate).

[19] Based on the average broadband user saving 15 hours per month by conducting transactions online (source: "The Economic Impact of Stimulating Broadband Nationally," a report by Connected Nation available here: http://www.connectednation.org/_documents/connected_nation_eis_study_executive_summary_02212008.pdf), valued at $22.42. per hour, one-half of the average hourly wage for Minnesota Is this accurate? The average wage is $44.84?(Source: United States Bureau of Labor Statistics, May 2012).

[20] Ibid.

[21] Based on 66% of home broadband users driving an average of 102 fewer miles per month because of their online activities (source: "The Economic Impact of Stimulating Broadband Nationally," a report by Connected Nation available here: http://www.connectednation.org/_documents/connected_nation_eis_study_executive_summary_02212008.pdf), with an average estimated fuel fleet economy of 25.67 per gallon (Source: US Highway Transportation Board), and each gallon of gasoline producing 19.4 lbs. of CO2 gas (Source: United States Environmental Protection Agency). This calculation only factors in the 78.9% of new broadband users who would be age 16 or older, based on the 2012 average ACS population distribution for the state of Minnesota (Source: US Census, 2012 American Community Survey 1-Year Estimate).

[22] Calculations based on the average value of $13.41 per ton for the carbon emission offsets charged by major U.S. carbon offset providers, as reported by Carbon Catalog (www.carboncontrol.org).

Connect Minnesota also conducted a business technology assessment and found that 76 percent of all Minnesota businesses are connected to broadband. Thirty-eight percent of all businesses in the state earn revenue from online sales, with revenue totaling $38 billion annually.

A summary of the office's activities in coordinating broadband infrastructure development under section 116J.391

DEED's broadband-related activities in 2013 focused primarily on the establishment of the Office of Broadband Development. In the process, DEED consolidated existing state resources for broadband and conducted the search for the executive director. Danna MacKenzie was appointed by the Governor as executive Director and assumed her position on January 6, 2014. The Office of Broadband Development will focus on broadband infrastructure, education, and use in 2014.

Suggested policies, incentives, and legislation designed to accelerate the achievement of the goals under section 237.012, subdivisions 1 and 2; Any proposed legislative and policy initiatives; Any other information requested by the legislative committees with jurisdiction over broadband policy and finance, or that the office deems necessary

The Office of Broadband Development, having just been established, is not yet in a position to provide policy recommendations to the Legislature. The preliminary data in this report suggests that Minnesota will need to take action if the State is to achieve the statutory goals set in 2010. However, additional research will be conducted in order to provide recommendations that target the areas of greatest need and provide the greatest opportunity for achieving the State's goals and objectives.