
Vijay Sethi – Submissions I Agree with most: I took the liberty of listing 8 instead of five. ☺

1. John Stanoch - Mapping: In February of this year, Connected Nation presented web-based maps of broadband availability in Minnesota that display broadband service in a searchable and verifiable format. Connected Nation's work is scheduled to be final this summer. As a result of this work, Minnesota has taken an important first-step in identifying unserved households. The Broadband Task Force and the State of Minnesota should build on this foundation and support a second phase of mapping that further refines the data compiled by Connected Nation. A complete understanding of the availability or lack of availability of broadband in specific areas of our state is essential to an informed discussion of broadband policy in Minnesota and an efficient utilization of public dollars to support broadband deployment and promotion.
2. Ubiquity : Steve Cawley - High-speed broadband service offerings should be made available to all citizens of Minnesota no matter where they live, work or play. Rural citizens have the same right to speed and quality as metro citizens. Particular effort is required to ensure that any rural/metro broadband divide is eliminated in the future. Internet service providers should be required to support any application a user chooses, within the scope of the law. Broadband service offerings should be fast enough to support all available service offerings that improve access to information, communication, social interaction, education, healthcare, business commerce, and entertainment.
3. Tom Garrison – Speed and Connection of Critical Infrastructure : If Minnesota is serious about achieving ultra high speed broadband, we must acknowledge that fiber optic delivery is the only known system today capable of two-way symmetrical transmission. While remaining open to other technical advances that can achieve higher speeds or capacity, our goal by 2015 should be full fiber deployment to every home and business, to every community, in the state. Noting that Minnesota is rated today as 23rd in average Internet speeds, 25th in Unique IP addresses per capita, and 26th in High Broadband IP's per capita (defined as speeds >5Mbps), our goal must be to dramatically improve connections, speeds and affordability of services. To become and remain globally competitive in the emerging knowledge-based economy, and to position our state as a center of innovation and employment, Minnesota's should adopt a goal of always being in the top three states nationwide and among the top five locations in the world in average available Internet speeds. These speeds and connections are both in the national and state interest, and all means necessary must be pursued to achieve them. Broadband must also, therefore, be defined in law as critical infrastructure.
4. Chris Swanson - Bandwidth (Speed) - It is critical that we define the amount of data that needs to move from point A to point B in a specific amount of time. We should define what Ultra means in relation to bandwidth speeds, and let's make sure we think beyond the present and what we may need in the year 2015. Currently hardware manufacturers sell hardware that has the ability to deliver 1Gbps speeds. We see internal networks or LAN's that deliver 1Gbps speed. However, the problem arises when we start talking about the current infrastructure used to deliver last mile bandwidth between the central offices/head end and the home or business. The speeds are limited by the current infrastructure used to deliver this last mile connection. The current infrastructure technologies such as phone circuits, DSL and coaxial served a very useful purpose for the growth of the internet and should not be discarded. However, as the demand for data speed increases those technologies are starting to reach maturity and have little room for speed growth. In fact, many of the incumbent providers have started bringing fiber closer to the premise (home or business) to increase the speed and usage requirements of their networks. This is because fiber is the technology that can deliver 1Gbps speeds today. The incumbents actions proves the last mile solution is the limiting factor that is holding us back from the bandwidth speeds that will be needed in the very near future. As a task force we have been challenged with going beyond the usual and ordinary. We recognize the limitations the current infrastructure creates for us as we try to deliver data the last mile. We further recognize that without setting a high bar we will allow for a larger digital divide and create a situation in which Minnesota will not be competitive in the global economy. We need to encourage technologies that allow for 1Gbps for last mile connectivity. Value -Based on past and current internet and data usage trends we should set the minimum bandwidth speed of 1Gbps connectivity and we should encourage the deployment of technologies that allow for the delivery of 1Gbps connectivity by 2015.

5. Jack Ries/Gopal – Public Sector Broadband Connection Speeds : It is estimated the public sector will need the following approximate broadband connection speeds for the above applications by 2015:

e.learning: Expand capacity and connectivity for the Learning Network of Minnesota.

- * 10 Gigabit (1,000 Mbps) network hub at every state higher education institution
- * 10 Gigabit network hub or connection to every large K-12 school district with 1 Gigabit to each school building in the district
- * One Gigabit connection to all other K-12 school districts with 100 Mbps to each school building in the district
- * 100 Mbps connection to every public library
- * 10 Gigabit shared connection to Internet 2 for the above
- * One Gigabit connection to every Public Television station in Minnesota.

e.emergency: Expand capacity and connectivity for the Public Safety and Homeland Security Networks of Minnesota.

- * 100 Mbps connection to each of the 63 National Guard armories or training centers
- * Multi-megabit connection to every public sector emergency responder facility including sheriff, police and fire, PCA, public health locations in the state

e.government: Expand the capacity and connectivity for all state, county and city locations.

- * 10 Gigabit network hub to every large county seat
- * One Gigabit network hub to every other county seat

6. Robyn West - (The answer below is specific to government institutions.) Today, high-speed broadband is delivered through a fragmented delivery system that often leaves government with limited cost-effective options. Creating cost-effective mechanisms for government to obtain high-speed broadband access would allow governments to make needed improvements for connectivity to and between government facilities, citizens, and businesses. This includes adding or improving capabilities for remote services for citizens, sharing information among governmental agencies, and providing infrastructure for alternative service delivery models (telecommuting, neighborhood service centers, collocation with other units of government).

Specifically, access to high-speed broadband can benefit government institutions by:

- Facilitating the installation of broadband service for state and local governments, local citizen communities and law enforcement agencies;
- Providing the ability to meet the continuing increase in demand for high-speed broadband by business and citizen communities;
- Providing the ability to handle large amounts of data for medical, library and other data-intensive applications;
- Providing for redundancy to ensure the availability of connectivity;
- Providing the potential for connectivity to other governmental units;
- Providing the potential for building broadband services to provide economic development opportunities; and
- Providing opportunities to partner with private providers to improve service to our citizens in underserved and unserved areas.
- Providing more flexibility on when and where meetings are held, in terms of the public to access their government. (save on overtime, travel, etc.)

7. Public Private Partnership : Robyn West –The market alone has not provided adequate high-speed broadband. It is difficult and cost prohibitive for either the public or private sectors to be the sole provider of high-speed broadband. By partnering together, public and private sectors can bring greater opportunities for widespread penetration of high-speed broadband to entire communities, including under served and unserved markets. An example of how this could be achieved includes having a government entity fund high-speed broadband infrastructure, allowing private service providers, for a fee, to utilize this infrastructure for their provision of broadband services. This partnership approach can result in providing widespread access to communities while encouraging market competition for the provision of high-speed broadband.

8. Tom Garrison – State Broadband Advisory Council : The differences between states that move ahead on broadband goals and those which complete reports that only gather dust is a suitable mechanism to implement strategic plans and a demonstrated continuing commitment to such plans. It is essential to Minnesota's economic future to have an ongoing state body dedicated to implementing its strategic plans for broadband. Lawmakers should create without delay a Minnesota Broadband Advisory Council with membership similar to the Minnesota Ultra High Speed Broadband Task Force, with terms and responsibilities set forth in statute and appropriate funding. At least ____ other states have broadband plans and advisory panels in place today. Many are funding significant investments in broadband, or assisting their states in having a unified approach to gaining federal (stimulus) funding. Membership should be explicitly broadened to correct for two notable omissions in the current task force make-up: large employer high tech businesses, and home-based or small company high-end users of broadband services. Lastly, as technology changes over time or the challenges facing strategic implementation of its broadband plan evolves, the Broadband Advisory Council should, at its discretion, have the ability to fill at least one slot on its panel with a subject matter expert capable of supporting its specific scope of work in any program year. The Broadband Advisory Council duties should include, but not be limited to:

- A required biennial report to the Governor and Legislature on progress towards reaching state broadband goals and, as needed, additional broadband policy recommendations
- Authority to make recommendations on emerging broadband opportunities and such other delegated duties as evaluating and granting funding as deemed appropriate by policymakers (evaluating stimulus funding proposals, etc.)
- Coordinate cooperative efforts and state broadband planning to lower costs and increase efficiencies in pursuit of the state's broadband goals
- Recommend to responsible authorities improvements to state building and electrical codes in furtherance of ultra high speed broadband deployment and high capacity use.
- Create a best practice definition of the size, number, depth and access spacing for communications conduits and develop a model ordinance/infrastructure design specification for conduit installations that can serve to further broadband deployment.
- Assess network vulnerability threats and the need for critical path redundancy.
- Assess Minnesota's progress toward meeting its ultra high speed broadband goals
- Coordinate education efforts to raise the level of broadband usage.
- Create policies that will further broadband deployment including when the trench is open
- Oversee ongoing state broadband mapping efforts.

Vijay Sethi – Submissions I disagree with :

1. Minnesota Leaders worldwide : John Gibbs - With a relatively light regulatory touch, some of Minnesota's broadband achievements over the past ten (10) years include the Connected Nation preliminary report that concludes 92% of Minnesota households have access to broadband. Connected Nation expects their final report to show that 94% of Minnesota households have access to broadband services. Applying this data to the Organization for Economic Co-operation and Development (OECD) broadband report, which ranks countries' broadband penetration each year, Minnesota not only leads the country with respect to broadband penetration, it leads the world. Additionally, the average download speed in Minnesota is 6.5 Mbps, higher than any other state studied by Connected Nation. Minnesota has several broadband providers providing services that far exceed the national average for download speeds and 55% of adult Americans have broadband access at home.

2. Unserved: Dick Sjoberg - Unserved is a geographic area where no provider offers Internet access service at transmission speeds of more than 768 kbps in at least one direction. Satellite broadband service, which is available throughout the country, should not be considered in applying this definition.
3. Goal for state must be based on evidence of demand: John Gibbs - Any establishment of a singular level of broadband service as a goal for the State must be based on evidence of demand for that level of service on a statewide basis. The Task Force has only an assortment of anecdotal information about demand for broadband, some positive and some negative. There is no evidence that the private sector has over-invested in broadband infrastructure. There is no evidence the private sector has underinvested. Establishing a goal for broadband service that is too high runs the risk of significant stranded investment - in other words, facilities that no one uses. If the goal is set too low, the State runs the risk of significantly underserving populations within the State of Minnesota who cannot obtain access to a basic level of broadband service. Given the lack of any evidence of the levels of broadband service demanded throughout the State, the Task Force recommends that any goal for a base level standard of broadband service in Minnesota be based on a basic level of functionality that the State desires be available to every person in the State. The task force believes this functionality should include the ability to e-mail and surf the web at download speeds of at least 1.544 Mbps.

Mike O'Connor – Paragraphs With Which I Agree

Page 25 -- Rick King - Ubiquity

All users in Minnesota, including both business and residential, should have access to tiered broadband services with the **agreed upon Task Force** minimum delivered through wireless, satellite, copper or fiber.

Page 25 Tom Garrison – Affordability – moved to e3

This task force finds that United States citizens pay, on average, more per megabit of service than citizens in most other industrialized nations of the world. The U.S. currently ranks no higher than 15th on most international measures of price per megabit of service. It is recommended Minnesota establish a data-driven Affordability Index and annually publish the results of which providers have the most affordable broadband services. Further the state should consider broadband access vouchers to defray the cost of broadband services for those who cannot afford it. These vouchers could be paid for either by legislative appropriation or based on a nominal per-subscriber fee assessed to all providers in the state.

Page 32 Jack Ries/Gopal - By 2015, ultra high-speed broadband capabilities will be required not only to connect public sector locations and communities, but also the citizens and businesses, to have adequate access for e.learning, e.mergency, e.government, and e.economic development. The drivers for ubiquitous high-speed broadband connection throughout the state of Minnesota for these four areas are many: e.learning: Minnesota's learning institutions planning e.learning applications need security, capacity, availability and world-wide connectivity, which will be a cornerstone requirement for broadband-enabled next generation state information infrastructure. This advanced capability is necessary for the following applications:

- Student web based learning systems
- Data driven decision making systems with a Minnesota orientation
- Instructional management systems for tracking and accountability
- Electronic video streamed and web based curriculum resources
- Student access to educators, counselors, and student services
- Shared interactive television, hybrid online/video, and online courses and instructional resources.
- High-stakes testing and assessment with various data collection devices
- Secure student information storage, transfer, and reporting with common protocols
- Reference, research, and access to information

- Network bandwidth traffic analysis and management
- Library web based resource & information systems
- Cost effective VoIP applications to expand constituent communication
- Internet 2 access and utilization
- Seamless data and video connectivity to higher education, state agencies, cities and counties to allow for exchange, use, and delivery of resources and services.

Page 34 Vijay Sethi - Redundancy to insure broadband service reliability: As high speed broadband fiber becomes the medium for the communication of vital functions such as police, dispatch and ambulance services, phone service, telemedicine services etc. a backup system needs to be available in the event of the failure of the primary fiber. This is probably not a major issue in the metro area and other population centers. However, in rural Minnesota a single fiber carrying the vital services to the remote and sparsely populated area of the state without a back-up option creates a major public safety concern.

Mike O'Connor – Paragraphs With Which I Disagree

Page 22 -- John Gibbs - With a relatively light regulatory touch, some of Minnesota's broadband achievements over the past ten (10) years include the Connected Nation preliminary report that concludes 92% of Minnesota households have access to broadband. Connected Nation expects their final report to show that 94% of Minnesota households have access to broadband services. Applying this data to the Organization for Economic Co-operation and Development (OECD) broadband report, which ranks countries' broadband penetration each year, Minnesota not only leads the country with respect to broadband penetration, it leads the world... [and the rest of the paragraph]

Page 30 –John Gibbs - Any establishment of a singular level of broadband service as a goal for the State must be based on evidence of demand for that level of service on a statewide basis. The Task Force has only an assortment of anecdotal information about demand for broadband, some positive and some negative. There is no evidence that the private sector has over-invested in broadband infrastructure. There is no evidence the private sector has underinvested. Establishing a goal for broadband service that is too high runs the risk of significant stranded investment - in other words, facilities that no one uses. If the goal is set too low, the State runs the risk of significantly underserving populations within the State of Minnesota who cannot obtain access to a basic level of broadband service. Given the lack of any evidence of the levels of broadband service demanded throughout the State, the Task Force recommends that any goal for a base level standard of broadband service in Minnesota be based on a basic level of functionality that the State desires be available to every person in the State. The task force believes this functionality should include the ability to e-mail and surf the web at download speeds of at least 1.544 Mbps.

Tom Garrison

The five topical paragraphs/sections submitted by other members of the task force that I liked best:
Availability/ Access/Ubiquity of Service, & User Choice

Peg Werner (From pages 4 & 27) - High-speed broadband access should be available to all Minnesotans. Geographic location should not be a barrier to bandwidth availability, speed of transmission or quality of service. Viewing broadband access as an essential service will improve the quality of life for Minnesotans and the businesses that choose to locate here. High-speed broadband facilities will provide access to essential information and services offered online, to healthcare providers in distant locations, to online educational opportunities, to informational and entertainment materials and resources, and to connections to businesses, customers and suppliers around the world. Not providing broadband access will put Minnesota at a distinct disadvantage as people choose locations to raise their families or to retire and businesses choose locations in which to locate and operate. Treating broadband access as a utility, as part of the common good will move Minnesota forward in the lives of both its

businesses and its citizens. In addition to guaranteeing broadband access throughout the state, it is necessary to ensure that access be affordable to everyone. A tiered level of service would offer varying intervals of bandwidth to meet various business and consumer needs. Subsidies to providers in areas where provision of broadband is more expensive and/or less profitable would ensure that broadband can be deployed across the state. Access for those unable to afford even a nominal cost, including hardware, software, broadband access and training, must be provided for by public agencies. Broadband access in Minnesota should be accomplished first by leveraging of the current infrastructure. All types of broadband technology could be extended from their current locations to cover all regions of the state. Because bandwidth requirements for businesses and residences will vary and because increased bandwidth capability may become essential quickly, the network should be designed with a clear plan to the future. A tiered level of service is desired, but these levels should also be built with ease of flexibility so that services can be increased quickly and without significant further costs . . . Ultimately, market competition, including public entities, for telco, cable, and wireless to each location would be ideal. See also **Steve Cawley** – (From page 30) High-speed broadband service offerings should be made available to all citizens of Minnesota no matter where they live, work or play. Rural citizens have the same right to speed and quality as metro citizens. Particular effort is required to ensure that any rural/metro broadband divide is eliminated in the future. Regarding user choice – (also from page 30) Internet service providers should be required to support any application a user chooses, within the scope of the law. Broadband service offerings should be fast enough to support all available service offerings that improve access to information, communication, social interaction, education, healthcare, business commerce, and entertainment. See also **Jack Geller, p. 4, Vijay Sethi, p. 5, and Brent Christensen, p. 55** regarding deployment to every citizen (that wants it.)

Competition to Achieve Ultra High Speeds

Chris Swanson, p. 10 We should encourage anyone who wants to build the Ultra infrastructure to do so including governmental, private owned and publicly traded entities. Much like the highways that allow anyone with a valid license to navigate them, our networks should allow for competition. FedEx and UPS compete on the same highway with DHL because the highway is available for public use. Competition is good when it comes to delivering Ultra High-Speed services because it keeps prices down, innovation up, and customer service at its best. No private service provider should be forced to have an open network, because they have paid to have that network built out. However, if public funds are used the network should require competition. Similar comments came from **Robyn West, p. 44** - The market alone has not provided adequate high-speed broadband. It is difficult and cost prohibitive for either the public or private sectors to be the sole provider of high-speed broadband. By partnering together, public and private sectors can bring greater opportunities for widespread penetration of high-speed broadband to entire communities, including under served and unserved markets. An example of how this could be achieved includes having a government entity fund high-speed broadband infrastructure, allowing private service providers, for a fee, to utilize this infrastructure for their provision of broadband services. This partnership approach can result in providing widespread access to communities while encouraging market competition for the provision of high-speed broadband. Also see **Joanne Johnson, page 56**, regarding reviewing and modernizing statutes to encourage competition. **O'Connor, page 8, and Werner, p. 7** (original, unedited language) on public/private partnerships.

Synchronous Speeds

Chris Swanson (from page 31) - Symmetrical - Uploading data as well as downloading data need to be considered as an important value. The internet was built to allow for two way communications and has turned into downloading being weighted heavier than uploading. We do not place enough of a value on the business that is creating the data that we are downloading. When this data is being created or shipped it is being uploaded.

There are a growing number of applications which require a symmetric connection in order for the product to work correctly. A growth market such as video applications, require faster symmetrical bandwidth. We cannot afford to stifle innovation, product quality and ability to get product to market because our upload speeds are far slower than our download speeds. Value- Based on the trends of video, data creation and the opportunity for business growth and communication we should value symmetrical connections. A 10% discrepancy between the upload and download speeds should be the maximum difference. Video growth creates a clear need for symmetrical internet connectivity. (Note: Steve Cawley says much the same thing on page 30.) **Cawley:** Broadband networks must be designed to provide symmetric service (equal download and upload speeds) in order support the full potential of many of the growing applications that will enhance the lives of Minnesota citizens, such as home telehealth, telecommuting, and home based businesses. See also **O'Connor**, p. 46 regarding symmetrical.

Redundancy

Vijay Sethi – (From page 34) Redundancy to insure broadband service reliability: As high speed broadband fiber becomes the medium for the communication of vital functions such as police, dispatch and ambulance services, phone service, telemedicine services etc. a backup system needs to be available in the event of the failure of the primary fiber. . . [I]n rural Minnesota a single fiber carrying the vital services to the remote and sparsely populated area of the state without a back-up option creates a major public safety concern. (Garrison note: someone inserted a comment in yellow on the same page that I agree with stating: “The Task Force recommends that the Legislature require an evaluation of the redundancy and security of the state broadband infrastructure.” This really needs to be done, but I think our report can already note a few things: i.e, only one 511 building, where NY has six of them, some connections to parts of the state pass over a single bridge, MnDOT restrictions on conduit pathways, etc. Perhaps we can suggest the elements to be in such a review, especially given the gravity of the foreign efforts to compromise US critical infrastructure.) See also **O'Connor**, p. 37 regarding Disaster Recovery, and **Garrison**, p. 44 last sentence regarding vulnerability and attack.

Creation of Broadband Authority to Carry Out Recommendations of Task Force

Rick King (from page 44) - Establishment of continuing authority in the state. The State should create an on-going commission to identify issues and solutions for ubiquitous broadband adoption in Minnesota. This commission and its members should be appointed by the governor [Garrison comment: this needs discussion. Legislature will feel strongly about input] and have regular meetings, staff support and funding. It would be charged with the implementation of the Task Force’s report and other outcomes from any federal stimulus money. Also see **O'Connor, p. 47:** Minnesota must position itself with committed and focused statewide broadband leadership that will be nimble and empowered to lead Minnesota’s internal efforts and leverage federal opportunities. The task force recommends that a permanent Broadband Advancement Authority be established with the tools and authority to take both short-term and long-term actions to continually improve Minnesota’s capacity.

Mike O'Connor - Designate one state agency as lead coordinator for defining and implementing statewide broadband policy to help ensure cohesion, speed, and efficiency.

Mike O'Connor - **Monitor progress with mapping and data collection**

Mike O'Connor - Implement an ongoing program of data collection and mapping to enable Minnesota’s policy-makers to monitor progress in achieving the state’s broadband goals. And also see **Stanoch, p. 56, Johnson, p. 56, and Garrison, p. 45.**

Final Note:

Finally, not part of my five topical paragraph submission, but I ***suggest we have a separate discussion item for a following meeting about paragraphs on which we all can agree.*** For instance, Jack Ries/Gopal comments on pages 32-33, and Kim Ross comments, p.38-41 (from Breaking Through Barriers on) seem to be straightforward and without likely dissent.

John Gibbs – 5 Items of Agreement

1. Jack Geller - Our Shared Values

This body of work, along with the recommendations presented in this document represents the core consensus values held by all Task Force members. Arriving at such a consensus is never easy, as the composition of the Task Force itself was designed to ensure representation from a wide variety of public and private organizations and constituencies. However, these core consensus values are held by all Task Force members and therefore represent the values of the Task Force itself. They include:

Ubiquity of Service (page 4)

Minnesota cannot afford to be the land of the broadband “haves and have-nots.” Rather, Task Force members believe that in the 21st century access to hi-speed Internet connections is a must for all Minnesota communities and residents; rural and urban. Today, economic development opportunities, educational opportunities, access to public services and quality-of-life amenities are increasingly being accessed through these hi-speed Internet connections. Accordingly, we believe that **availability** ~~ubiquity~~ of service across all of Minnesota is a must. At the same time, the Task Force recognizes the outstanding work that telecommunications providers across the state have already accomplished in pursuit of this goal. All of the information and data presented to the Task Force through national and state sources, as well as the recent state-supported broadband mapping project suggests that Minnesota is well ahead of many other states and well positioned to make ubiquity a reality.

One Size Does Not Fit All

The Task Force recognizes that Minnesota businesses, governments and residents utilize their broadband connections to meet a variety of needs; each requiring a different optimal connection speed. These needs can range from delivering a simple email message, to transmitting large and complex architectural blueprints, to downloading high-definition video files. Further, we believe that our collective needs will simultaneously both broaden and require increasingly high connection speeds as new and augmented applications continue to emerge and Minnesotans continue to embrace this delivery and service mode. As a result, the Task Force believes that while ubiquity is a must, we must also recognize that the definition of an optimal connection speed is based upon functionality. We believe that while there may be some value in advocating for a policy that defines a statewide minimum connection speed, a policy that identifies a uniform connection speed across Minnesota is not in the best interest of the state. Supply and Demand Connectivity

All of the information and data reviewed by the Task Force continues to reinforce the reality that identified inequities in broadband adoption, accessibility and availability across Minnesota are a function of demographic, socio-economic and geographic factors. Therefore, if we address the infrastructure issues alone, we may meet the desired goal of ubiquity in availability, but it will not yield the desired results of widespread adoption and use. Only by simultaneously addressing the issues associated with both the supply and demand side of this issue will we move Minnesota forward.

2. p. 50 Mike O'Connor

Significant aspects of universal access should include:

- The ability to access to infrastructure regardless of where you live. Broadband must be widely distributed, and should support bandwidth that will enable people everywhere to use it.

- Affordable access. Broadband infrastructure- including rules, pricing, taxes, etc. should make access affordable for all income levels-to ensure that as many people as possible have access.
- Access in the workplace -especially for those whose primary access is at work.
- Public access. Given that many people will not be able to have private home computers and internet access, a premium should be placed on creating public access points such as telecenters, libraries, community centers, clinics and schools-so that all people can have access within walking distance of where they live or work.
- Access to information that is culturally and linguistically diverse and representative of all of MN's ethnic and racial groups. Additionally, since most internet content and hardware is dominated by the use of Latin script, and given MN's large Hmong, Lao, Vietnamese, and Somali communities- MN should ensure the development of local content in non-Latin languages. Technical development should encourage linguistic diversity on the internet and simplify the exchange of information across languages.

3. A description of economic development opportunities made possible by the wide dissemination of high-speed broadband.

Dan McElroy – (Page 34) We would look at various ~~public-utility~~ investments holistically. Not excited about having industrial parks spring up 20 miles away from the exchange/sewer/water. Avoid economic development "sprawl."

4. Jack Ries/Gopal Khanna– (Page 32)

By 2015, ultra high-speed broadband capabilities will be required not only to connect public sector locations and communities, but also the citizens and businesses, to have adequate access for e.learning, e.mergency, e.government, and e.economic development. The drivers for ubiquitous high-speed broadband connection throughout the state of Minnesota for these four areas are many: e.learning; Minnesota's learning institutions planning e.learning applications need security, capacity, availability and world-wide connectivity, which will be a cornerstone requirement for broadband-enabled next generation state information infrastructure. This advanced capability is necessary for the following applications:

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- Secure student information storage, transfer, and reporting with common protocols
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- Library web based resource & information systems
- Cost effective VoIP applications to expand constituent communication
- Internet 2 access and utilization
- Seamless data and video connectivity to higher education, state agencies, cities and counties to allow for exchange, use, and delivery of resources and services.

5. John Stanoch – (Page 21) Mapping.

In February of this year, Connected Nation presented web-based maps of broadband availability in Minnesota that display broadband service in a searchable and verifiable format. Connected Nation's work is scheduled to be final this summer. As a result of this work, Minnesota has taken an important first-step in identifying unserved households. The Broadband Task Force and the State of Minnesota should build on this foundation and support a second phase of mapping that further refines the data compiled by Connected Nation. A complete understanding of the availability or lack of availability of broadband in specific areas of our state is essential to an informed discussion of broadband policy in Minnesota and an efficient utilization of public dollars to support broadband deployment and promotion.

John Stanoch - The highest priority of the Broadband Task Force should be to bring high speed Internet service to residents and businesses in Minnesota where it is currently unavailable. Expanding broadband access to previously unserved areas will increase the number of Minnesotans using broadband and increase demand for services provided over the Internet. It is inappropriate at this time to focus limited government resources and initiatives on those areas where high speed Internet is available from existing providers. Areas currently lacking a broadband connection tend to be high-cost service areas. Provider incentives are an important way to encourage deployment in high cost areas. Some options to consider include:

- a. A grant or matching grants program for some portion of the build in a high cost areas. The State of Idaho, for example, provided \$5,000,000 in state grants to eligible providers who deployed broadband service in unserved areas. As one option, a state agency in Minnesota such as the Department of Commerce could be asked to create a technology neutral competitive broadband grant process for unserved areas.
- b. Tax incentives for broadband deployment.

John Gibbs – 5 Items of Disagreement:

1. Anti-private investment philosophy.

Mike O'Connor (Page 9) - Absentee-ownership of broadband infrastructure and service has failed to deliver universal high speed broadband networks. Non-local corporations have sometimes failed to invest in infrastructure because some areas will not offer the level of return available from wealthier, more densely populated markets. Minnesota broadband policies should prioritize local ownership in our communities, thus encouraging self reliance and investment in place. Local ownership would address problems ignored by absentee-owners such as lack of broadband access, slow speeds, limited (if any) provider choice, and aggregation of demand. Communities should be empowered and ultimately held.

2. Minnesota is not behind the rest of the country or the world with respect to broadband access or affordability.

If we are to regain our position of dominance in the world . . . p. 5

While Minnesota is now in the middle of the pack when it comes to most aspects of information technology p. 12.

p. 26 Tom Garrison. This task force finds that United States citizens pay, on average, more per megabit of service than citizens in most other industrialized nations of the world. The U.S. currently ranks no higher than 15th on most international measures of price per megabit of service.

p. 25-26 Rick King. Consumer adoption will be greatly impacted by the cost of tiered services. It will be important for us to ensure lower tiers of service are available by themselves or in packages that are affordable for all income brackets

p. 30 Tom Garrison - Noting that Minnesota is rated today as 23rd in average Internet speeds, 25th in Unique IP addresses per capita, and 26th in High Broadband IP's per capita (defined as speeds >5Mbps), our goal must be to dramatically improve connections, speeds and affordability of services. To become and remain globally competitive in the emerging knowledge-based economy, and to position our state as a center of innovation and employment, Minnesota's should adopt a goal of always being in the top three states nationwide and among the top five locations in the world in average available Internet speeds.

3. Broadband Service is Not a Utility and Should Not Be Subject to Common Carrier Regulation.

Peg Werner p. 4. Treating broadband access as a utility, as part of the common good will move Minnesota forward in the lives of both its businesses and its citizens.

Peg Werner p. 27 If technology neutrality is desired, a single high capacity connection could be constructed that would be accessible to multiple providers.

p. 44 Robyn West An example of how this could be achieved includes having a government entity fund high-speed broadband infrastructure, allowing private service providers, for a fee, to utilize this infrastructure for their provision of broadband services. This partnership approach can result in providing

widespread access to communities while encouraging market competition for the provision of high-speed broadband.

p. 47-48 Mike O'Connor - For much of the 20th century, the United States and most other nations found it useful to develop a notion of common carriage for communications and a status known as common carrier for the communications providers themselves. A common carrier must provide a neutral communications platform. IP packets should be delivered between parties regardless of who they are, what is talked about, what the content of their packets are, and so on. As long as each party pays its bills on time, they should be treated by the provider as a legitimate and equal user of the network. As a network of networks, the very architecture of the Internet demands that packets be routed regardless of who the initiator and recipient of the communications are, whether the communication constitutes information or entertainment, the language used, and so on.

Minnesota should require the more strict standard of common carriage on networks serving the state. Common carriage has been applied to canals, roads, bridges, telephone networks and more. The network owner must not be allowed to monopolize the network or it will diminish societal benefit and inhibit innovation. In the event that a competitor wishes to use the network to provide services to a customer, the network owner must offer a wholesale rate no higher than the cost the network owner charges internally for the delivery of its own service.

p. 48 Mike O'Connor - Require that broadband providers provide tools by which consumers can verify (and challenge) the information that providers are collecting (e.g., consumption speed and data volume) along the lines that credit-reporting agencies are required to provide. [Not sure of the intent of this point]

p. 48 Mike O'Connor - Broadband networks should have to meet reliability performance standards. Broadband connections are replacing traditional phone lines but do not offer the same high level of uptime. This is especially true of some wireless networks. Networks should meet some reliability metric as part of the performance standards that will be evaluated as part of the oversight designed to prevent fraud and wasteful use of taxpayer money. [Is this intended to mirror traditional telephony service quality regulation? Do traditional notions of regulation apply to a competitive marketplace?]

p. 48 Mike O'Connor - In addition to uptime requirements, Internet providers should be required to meet a threshold of customer service. Many states already have metrics and systems for reporting the time customers spend on hold or waiting for a support call to be answered. [Same comment as above plus, are existing consumer fraud laws inadequate?]

p. 52 Tom Garrison - In addition, much in the way highway, railroad or airport infrastructure systems are publicly funded so all stakeholders can benefit from their use, public broadband investments should be geared to open networks over which many competitive providers can ride, rather than closed-end networks serving a single provider.

4. Unnecessary Expansive Government Role in Marketplace.

Tom Garrison – (Page 45) State Broadband Advisory Council

Tom Garrison - The differences between states that move ahead on broadband goals and those which complete reports that only gather dust is a suitable mechanism to implement strategic plans and a demonstrated continuing commitment to such plans. It is essential to Minnesota's economic future to have an ongoing state body dedicated to implementing its strategic plans for broadband. Lawmakers should create without delay a Minnesota Broadband Advisory Council with membership similar to the Minnesota Ultra High Speed Broadband Task Force, with terms and responsibilities set forth in statute and appropriate funding. At least ____ other states have broadband plans and advisory panels in place today. Many are funding significant investments in broadband, or assisting their states in having a unified approach to gaining federal (stimulus) funding. Membership should be explicitly broadened to correct for two notable omissions in the current task force make-up: large employer high tech businesses, and home-based or small company high-end users of broadband services. Lastly, as technology changes over time or the challenges facing strategic implementation of its broadband plan evolves, the Broadband Advisory Council should, at its discretion, have the ability to fill at least one slot on its panel with a subject matter expert capable of supporting its specific scope of work in any program year. The Broadband Advisory Council duties should include, but not be limited to:

- A required biennial report to the Governor and Legislature on progress towards reaching state broadband goals and, as needed, additional broadband policy recommendations
- Authority to make recommendations on emerging broadband opportunities and such other delegated duties as evaluating and granting funding as deemed appropriate by policymakers (evaluating stimulus funding proposals, etc.)
- Coordinate cooperative efforts and state broadband planning to lower costs and increase efficiencies in pursuit of the state's broadband goals
- Recommend to responsible authorities improvements to state building and electrical codes in furtherance of ultra high speed broadband deployment and high capacity use.

Mike O'Connor – (Page 47) The task force firmly believes that there will be a significant shift to a more proactive national policy on these matters over the next several years. The election of a new “wired” President and the appointment of broadband-savvy members in a new administration is complemented by increasing concern in Congress and widespread recognition of broadband advancement as a key element of the nation's economic recovery. In addition to adopting a strong vision, Minnesota must position itself with committed and focused statewide broadband leadership that will be nimble and empowered to lead Minnesota's internal efforts and leverage federal opportunities. The task force recommends that a permanent Broadband Advancement Authority be established with the tools and authority to take both short-term and long-term actions to continually improve Minnesota's capacity.

5. Attacking Connected Nation Mapping Results.

p. 24 Mapping project – we haven't seen the final version yet. When we do see the final version, it's an imperfect product for a number of reasons – budget, confidentiality of date, methodological assumptions. Areas served by DSL were assumed to have service to the end of the exchange, even though they really only extend 15000 feet from the switch. So the DSL portions of the map have built-in inaccuracies. Similarly, if any person in a county had broadband access, the whole county was counted as having access – again, a distortion that needs to be corrected in subsequent efforts.

It is a problem that the maps don't reflect prices, costs or affordability. This should be addressed in subsequent mapping projects. Similarly, we need to see take-rates, perhaps based on community-based polling/mapping efforts.

JoAnne Johnson Five Submissions I agree with most: (I also agree with most everything Jack Geller said, as well as several other submissions. But I found these subject experts and common sense entries to be the most valuable to the report.)

1. **Healthcare** Mary Ellen Wells - **Economic Development and Health Care Opportunities Through High-Speed Broadband**

Mary Ellen Wells - There are many industries and markets that would benefit from the proliferation of High-Speed Broadband to all towns and homes throughout the state. One specific area that would greatly benefit is Health Care. To summarize, within Health Care, there are three key elements to consider with the promise of ultra high-speed broadband service throughout Minnesota.

Mary Ellen Wells - First, Access. Currently, there are many throughout the state who could reap many benefits from having reasonably-priced high speed internet available to their organizations and homes. For example, the lack of and the high cost of high-speed broadband can limit a hospital or senior care center from offering many of the technologies that exist. Individuals who live outside population centers could have Home Care applications or could telecommute for a wide variety of business functions (Coders, Billers, Transcriptionists). As a result, economic opportunities are thwarted and people must travel great distances to receive care that could be offered closer to home.

Mary Ellen Wells - Second, Quality. We've learned that high-speed broadband provides organizations the opportunity to offer advanced specialty services through

telehealth applications such as the eICU, telepsychiatry, and teleradiology. These and other similar applications bring highly trained specialists to communities that cannot otherwise offer these services. As a result, patients are treated earlier in their disease process and also keep patients in their community. Additionally, the proliferation of eHealth records can greatly improve the

Mary Ellen Wells - Third, Cost. Everyone is experiencing the growing cost of health care. As the baby boomers age, health care costs are projected to increase far above what the current model can support. Telehealth services, that require high-speed broadband, can support the changes that are needed in the current health care delivery system. For example, by providing high-speed broadband access to every home, the current health care model can change. Home monitoring and Home health care applications can prevent acute illness that drives costs up. Also, having people leave their homes and communities to seek specialty care is extremely costly. Patients as well as family members must often take time off of work and be away from home when they must travel for care that is not offered locally.

Mary Ellen Wells - Refer to the March 24, 2009 Panel discussion for more detailed information on concepts and applications that utilize High-Speed Broadband.

2. Kim Ross - For the K-12 Education Section of the report.

Kim Ross - Section 1 of Article XIII of the Minnesota Constitution states:

Kim Ross - UNIFORM SYSTEM OF PUBLIC SCHOOLS.

Kim Ross - The stability of a republican form of government depending mainly upon the intelligence of the people, it is the duty of the legislature to establish a general and uniform system of public schools. The legislature shall make such provisions by taxation or otherwise as will secure a thorough and efficient system of public schools throughout the state.

Kim Ross - From SETDA High Speed Broadband Access for All Kids: Breaking Through the Barriers

Kim Ross - High-speed broadband access and connectivity are vital for economic growth, global competitiveness, education, innovation, and creativity. Ensuring high speed broadband access for all students has become a critical national issue especially when considering preparing our students for work and life in the 21st century. SETDA members and the greater educational community recognize that robust high-speed broadband access in all of our nation's schools will accelerate our teachers' ability to teach and our students' ability to learn. SETDA identifies the key issues facing the educational community relating to robust connectivity and recommends how states and districts can successfully implement highspeed broadband in their schools as well as recommends what stakeholders and policymakers can do to support bringing this critical issue to a national policy level.

Kim Ross - Key Issues

Kim Ross - • Schools need high-speed broadband access to effectively create rigorous, technology-infused learning environments

Kim Ross - • Students need affordable, high-speed broadband access at home to extend learning 24/7

Kim Ross - • Teachers need guaranteed, long-term access to high-speed broadband to enrich the curriculum to include technology applications such as videoconferencing and distance learning

Kim Ross • Teachers need high-speed broadband access for professional development, and engaging in professional learning communities as well as accessing new educational resources such as curriculum cadres and education portals

Kim Ross - • Administrators need high-speed broadband access to conduct online assessments and to access data for effective decision making

Kim Ross - • Students need high-speed broadband access in their schools to take advantage of a wide range of new and rich educational tools and resources available for anytime, anywhere learning

Kim Ross - • Students need high-speed broadband access to overcome the digital divide in rural and low socio-economic areas

Kim Ross - From the Learning Network of Minnesota Blue Print for K-12 Education and Public Libraries, April 2009

*Kim Ross - **CONCERNS AND ISSUES***

Kim Ross - While the diverse infrastructure serving K-12 public education, public libraries and higher education facilities is providing workable service, there are concerns relating to future growth and needs. As school districts and libraries experience continuing demands for the availability of expanded educational opportunities and online content, the appetite for high speed bandwidth also grows. Some of the current barriers to network growth include:

Kim Ross - 1. Limited funding for K-12 education and public libraries to sustain high speed network connections. K-12 education currently receives \$3.75 million from the state to help support telecommunications access after E-rate discounts are taken into account. This amount falls far short of actual after E-rate costs, which are closer to \$9 million annually. It also needs to be noted that the current funding between E-rate and the state telecommunications/Internet access equity aid provides limited support to only existing infrastructure and does not support any network growth or response to increased needs. Public libraries currently receive \$2,300,000 each year to assist with after E-rate costs, but again this sustains only the current level of bandwidth and does not provide room for network growth. Both school districts and public libraries also invest heavily in local infrastructure that allows them to use the telecommunications services provided through their regions.

Kim Ross - 2. K-12 school districts and public libraries, particularly those in rural areas, are limited to the existing telecommunications infrastructure provided by service providers and carriers. This means that some areas of the state have seen the benefits of high speed fiber connectivity that is not available in many of the more rural areas of the state. Telecommunications providers need to have a return on investment to bury fiber, which is an expensive enterprise, and rural communities often are not able to provide that level of return.

Kim Ross - 3. K-12 schools and public libraries are often located many miles away from the local telecommunications provider hub, therefore experiencing high transport costs resulting from having to traverse multiple exchanges.

Kim Ross - 4. Bandwidth needs are continually growing in the K-12 and public library community. According to the Public Library Funding and Technology Access Study released by the American Library Association in 2008, 73% of libraries nationwide report that they are the only source of free Internet access in their community. In times of recession, reliance on Internet access at the public library is critical for many citizens as they use library access to employment opportunity information and government services. The State Education Technology Directors Association (SETDA), in their June 2008 report, High-Speed Broadband Access for All Kids: Breaking Through the Barriers, also acknowledges the growing bandwidth needs of teachers and students as online applications for learning grow increasingly interactive and media-rich.

Kim Ross - 5. There is no advocate at the state level for K-12 and public library broadband access. Higher education has these advocates in their system presidents and chief information officers.

Kim Ross - GOALS

Kim Ross - 1. K-12 and public libraries continue to need a sustained, adequate funding source that is adequate to current needs and allows room for growth. For K-12, the current \$3.75 million in the state's base budget is not sufficient to support reasonable Internet access and distance learning connectivity. School districts are often working with substandard levels of access to support their core business function - to deliver education opportunities and manage the school. Telecommunications access is now the foundation for delivery of education and library resources. An increased investment in telecommunications access for schools and libraries from the state would provide a huge return on investment in terms of the additional programming and resources that could be provided to students and library customers.

Kim Ross - 2. K-12 public education needs to move beyond current bandwidth limitations supported by the state telecommunications/Internet access equity aid program, which support only a T1 level of service (1.544 Kbps) per school. The SETDA High Speed Broadband Access for All Kids: Breaking Through the Barriers national report recommends the following levels of access for 21st century learning and Minnesota needs to start working in this direction for the next 2-3 years:

- Kim Ross - An external Internet connection to the Internet service provider of at least 10 Mbps per 1,000 students and staff
- Kim Ross - Internal wide area network connections from the district to each school and between schools of at least 100 Mbps per 1,000 students/staff

Kim Ross - SETDA also recommends that a technology rich learning environment in the next 5-7 years should have:

- An external Internet connection to the Internet service provider of at least 100 Mbps per 1,000 students and staff
- Internal wide area network connections from the district to each school and between schools of at least 1 Gbps per 1,000 students and staff

Kim Ross - 3. In the absence of stable, equitable funding, it has been difficult to establish standards for videoconferencing. For example, while most of the telecommunications access clusters are working towards the H.323 videoconferencing standard with quality of service (QOS), it is difficult for us to reach an efficient level of interconnectivity when local funding availability and eligibility for grants varies so widely.

Kim Ross - 4. Telecommunications providers must be provided with incentives to invest in rural communities and to work together in order to provide consistent pricing in broadband services to all areas of the state. This access is critical not only to education and public libraries, but is needed to sustain economic growth and global competitiveness for our state.

Kim Ross - 5. The K-12 education community needs an open network infrastructure that continues to allow interconnectivity, connections with higher education, and access to Internet 2.

Kim Ross - 6. The network structure needs to recognize organizational autonomy and provide flexibility to meet local needs.

Kim Ross - 7. Many students in Minnesota receive courses via interactive television. The Learning Network of Minnesota needs to provide quality of service for video conferencing to ensure these learning experiences are engaging and effective for students.

Kim Ross - 8. There is a need for understanding and advocacy at the state level for high speed bandwidth that meets the needs of schools and public libraries.

3. **Vijay Sethi - Local, state and federal governments**

Local, state and federal governments have a critical role to play in achieving ubiquity of ultra high speed broadband service in Minnesota. The private sector business models, based on cost/benefits scenarios, are very effective in serving the needs of the geographic areas - metro as well as rural-with adequate population densities that allow reasonable returns on investments and where the users can afford to pay for the services. There is little incentive for the private companies to serve those areas which do not have the "critical mass" of paying customers. State Local governments can play a major role by 1) Identifying the unserved and underserved areas, 2) serving as the information clearinghouse for available resources and infrastructure , 3) developing collaborative partnerships among public, and private sector participants aimed at maximizing the use of existing infrastructure owned and operated by private and public partners, 4) helping to navigate through the regulatory process and 5) assisting with financial incentives and funding opportunities available at the local, regional, state and federal levels. Additionally, at the state and federal levels, the government's role is to enact policies that encourage public/private partnerships, and to provide financial resources aimed at providing the ultra high speed broadband to the unserved and underserved part of the state as well as financially disadvantaged persons and households.

4. **Dick Sjoberg - The lack of demand for broadband service is usually not caused by a lack of availability.**

A paper by the Technology Policy Institute (TPI) cites a 2007 study by Parks Associates finding that 29% of U.S. households are not planning to subscribe to a broadband service. Of those not planning to subscribe to broadband, only 3% said it was because Internet was not available to them. Seven percent (7%) of those not planning to subscribe cited affordability as the reason. Fourteen percent (14%) of those not planning to subscribe said they could not afford a computer. Forty-four percent (44%) said they did not want to have anything to do with the Internet. TPI concludes that from a policy perspective, spending a lot of public money on infrastructure will not affect household penetrations rates. Instead, policy makers should consider targeting subsidies at low-income consumers who would subscribe if they could afford the service. Programs designed to provide computers to low-income populations through public libraries or "community technology centers" also make sense. ***Make sure footnotes get added ***

S. Walsten, "Understanding International Broadband Comparisons," at p. 12 (Technology Policy Institute May 2008)(herein "TPI Report"). Id. Id. at 12 (Figure 5). Id. Id. Id. at 13.

Dick Sjoberg - b. **Consumer Choice.** Most residential and business consumers have several different choices among broadband providers in Minnesota. According to the FCC, there are 98 broadband service providers in Minnesota, many of them acting in competition with each other. The market share between DSL, cable, and other broadband platforms is fairly evenly split according to the FCC. The degree of choice available in the business market is probably much greater than it is in the residential market. The task force has collected very little data on the Minnesota broadband business market.

Dick Sjoberg - c. **Acknowledging That Price is a Function of Cost.** Intermodal competition is resulting in price competition as well. Despite this good news, more competitors in the market will not always result in lower prices for consumers. One fundamental economic concept that policy makers tend to ignore is that price is a function of economic cost. The cable and telecommunications industry has invested billions of dollars in plant and equipment over the past ten years in order to provide broadband services. Build-out requirements at the local franchise level have required cable operators to offer service to everyone in the cable operator's franchised area. Cable operators will not provide service at a price that falls below the economic cost of providing the service.

5. Jack Ries/Gopal –

By 2015, ultra high-speed broadband capabilities will be required not only to connect public sector locations and communities, but also the citizens and businesses, to have adequate access for e.learning, e.mergency, e.government, and e.economic development. The drivers for ubiquitous high-speed broadband connection throughout the state of Minnesota for these four areas are many: e.learning: Minnesota's learning institutions planning e.learning applications need security, capacity, availability and world-wide connectivity, which will be a cornerstone requirement for broadband-enabled next generation state information infrastructure. This advanced capability is necessary for the following applications:

- Student web based learning systems
- Data driven decision making systems with a Minnesota orientation
- Instructional management systems for tracking and accountability
- Electronic video streamed and web based curriculum resources
- Student access to educators, counselors, and student services
- Shared interactive television, hybrid online/video, and online courses and instructional resources.
- High-stakes testing and assessment with various data collection devices
- Secure student information storage, transfer, and reporting with common protocols
- Reference, research, and access to information
- Network bandwidth traffic analysis and management
- Library web based resource & information systems
- Cost effective VoIP applications to expand constituent communication
- Internet 2 access and utilization
- Seamless data and video connectivity to higher education, state agencies, cities and counties to allow for exchange, use, and delivery of resources and services.

Jack Ries/Gopal - e.mergency: Minnesota's public safety and emergency response needs broadband for rapidly sharing information between public safety and private entities as well as cyber security, 24X7 availability and fault protection. Broadband is also required to support seamless disaster management between branches and levels of government. e.government: Minnesota's health, welfare and public service delivery needs require high-speed connectivity across all branches and levels of government. In addition to high-speed the state information infrastructure must provide for confidentiality, fault protection, and cost-efficiency. e.economic development: Minnesota's need to stay competitive in a global economy requires citizens and businesses to have cost-effective high-speed broadband connectivity. This is necessary for access to global markets, share and move information between locations, provide employees telecommuting opportunities to lower costs and increase retention to provide a few examples.

Jack Ries/Gopal - It is estimated the public sector will need the following approximate broadband connection speeds for the above applications by 2015:

e.learning: Expand capacity and connectivity for the Learning Network of Minnesota.

- 10 Gigabit (1,000 Mbps) network hub at every state higher education institution
- 10 Gigabit network hub or connection to every large K-12 school district with 1 Gigabit to each school building in the district
- One Gigabit connection to all other K-12 school districts with 100 Mbps to each school building in the district
- 100 Mbps connection to every public library
- 10 Gigabit shared connection to Internet 2 for the above

- One Gigabit connection to every Public Television station in Minnesota.

e.mergency: Expand capacity and connectivity for the Public Safety and Homeland Security Networks of Minnesota.

- 100 Mbps connection to each of the 63 National Guard armories or training centers
- Multi-megabit connection to every public sector emergency responder facility including sheriff, police and fire, PCA, public health locations in the state

e.government: Expand the capacity and connectivity for all state, county and city locations.

- 10 Gigabit network hub to every large county seat
- One Gigabit network hub to every other county seat

JoAnne Johnson – Five positions I most disagree with:

- That broadband is an essential service, inalienable right, any stringent or strident declaration that it has become an end unto itself. I believe it's a tool, a very good tool, but just a tool nonetheless for attaining better education, healthcare, economic development and recovery, entertainment and social interaction.
- The indicators within paragraphs that seem to imply only the public sector can be considered national leaders in judging systems or provide what the state requires by way of:
 - Better financing,
 - Local ownership, or
 - Proper network management.
- The references to prohibiting 'caps' on usage while still professing to accept tiered service seem disingenuous.
- While I find several references to estimates of what specific applications and user groups will need in the next 6 years to be acceptable, broad stroke minimums or one size fits all or symmetry only statements are not.
- I disagree with many of O'Connor's statements because he made a LOT of them. I usually find myself disagreeing with parts of what Garrison and Swanson have written, but find no useful way of distilling out specific paragraphs or parts of paragraphs that would be productive to clip and copy without causing some level of offense. So this is how I've chosen to complete this part of the assignment.

Peg Werner – Five submissions I agree with the most:

1. Tom Garrison - Speed & Connections of Critical Infrastructure

Tom Garrison - If Minnesota is serious about achieving ultra high speed broadband, we must acknowledge that fiber optic delivery is the only known system today capable of two-way symmetrical transmission. While remaining open to other technical advances that can achieve higher speeds or capacity, our goal by 2015 should be full fiber deployment to every home and business, to every community, in the state. Noting that Minnesota is rated today as 23rd in average Internet speeds, 25th in Unique IP addresses per capita, and 26th in High Broadband IP's per capita (defined as speeds >5Mbps), our goal must be to dramatically improve connections, speeds and affordability of services. To become and remain globally competitive in the emerging knowledge-based economy, and to position our state as a center of innovation and employment, Minnesota's should adopt a goal of always being in the top three states nationwide and among the top five locations in the world in average available Internet speeds. These speeds and connections are both in the national and state interest, and all means necessary must be pursued to achieve them. Broadband must also, therefore, be defined in law as critical infrastructure.

2. Tom Garrison - Role of Government

Tom Garrison - Just as it does with all other forms of critical infrastructure (roads, bridges, airports, building codes, electrical supply, telephone service, etc.), state government has a vital role to play in terms of setting policy and regulations that are in the public interest and protect public safety. Regarding improving the speeds, availability, and affordability of broadband services, all state barriers to the provision of broadband service by public entities should be removed as long as such provision is the wish of a plurality of that's jurisdiction's citizens. There should be no discrimination between public and private entities in their ability to provide broadband services. Many municipalities will have no interest in the direct provision of service unless the market is unwilling or unable to provide the services communities feel they need to survive and thrive in the global marketplace. The state should recognize that no one size fits all and no singular tactic can achieve the state's broadband goals, without all interested stakeholders-existing providers, new entrants, and communities of interest-being able to pursue their economic future and broadband goals. Municipalities-those closest to their citizens-have an important role to play in convening community broadband conversations and planning with their local business community. Further, municipalities have a crucial role to play in potentially spreading out the cost and speeding up the timetable of broadband improvements by virtue of their bonding authority which can facilitate 20-30 year return on investments, rather than having to meet strict 1-3 year ROI. Policymakers should consider utilizing this powerful tool by explicitly permitting public/private partnerships that further ultra high-speed broadband goals. Policymakers should also reaffirm municipal authority to require conduit installation. Just as cities have an interest in the so-called "last mile" closest to them, the state has an indispensable interest in the necessary "middle mile" connections to its citizens and localities that ensure both security and redundancy in those essential connections, sustain business commerce and jobs, provide e-government functions, and protect vital networks and data from outside vulnerability and attack.

3. Brent Christensen - Affordability is a factor in any discussion about adoption. It can be measured in two ways; what a customer considers reasonable and is willing to pay for a product or service, and the price charged by the producer versus the cost of production and it's relation to similar products or services. Broadband is no different. Because it is relatively new, it is still not in most consumers' budgets or is related to the cost of basic telephone service.

Brent Christensen - The government made a decision in 1934 that basic telephone service was a requirement for every citizen. That same rationale can be applied the deployment of broadband. Geography should be a barrier to broadband access.

Brent Christensen - The 1934 Telecom act also addressed affordability. Because of the importance of broadband access, economic factors must be addressed. Existing low income programs should be expanded to assist low income families with access to broadband. Geography and economics should not be a barrier to access.

Brent Christensen - Since it is not feasible to scrap the existing network and start over, the government should provide economic incentives for providers to build out their networks. Sales tax exemption for broadband equipment purchased and deployed, similar to existing telephone equipment purchases is but one example.

Brent Christensen - Deployment of broadband is only one side of the equation. The state needs to provide incentives for consumers to adopt the technology. Just adding monthly broadband service to the existing list of qualifying tax deductions would be one way to encourage adoption. Another option would be to offer state funded rebates for computer purchases for low income, students, and the elderly.

4. John Stanoch - The highest priority of the Broadband Task Force should be to bring high speed Internet service to residents and businesses in Minnesota where it is currently unavailable. Expanding broadband access to previously unserved areas will increase the number of Minnesotans using broadband and increase demand for services provided over the Internet. It is inappropriate at this time to focus limited government resources and initiatives on those areas where high

speed Internet is available from existing providers. Areas currently lacking a broadband connection tend to be high-cost service areas. Provider incentives are an important way to encourage deployment in high cost areas. Some options to consider include:

- A grant or matching grants program for some portion of the build in a high cost areas. The State of Idaho, for example, provided \$5,000,000 in state grants to eligible providers who deployed broadband service in unserved areas. As one option, a state agency in Minnesota such as the Department of Commerce could be asked to create a technology neutral competitive broadband grant process for unserved areas.
- Tax incentives for broadband deployment.

5. Mike O'Connor - Absentee-ownership of broadband infrastructure and service has failed to deliver universal high speed broadband networks. Non-local corporations have sometimes failed to invest in infrastructure because some areas will not offer the level of return available from wealthier, more densely populated markets. Minnesota broadband policies should prioritize local ownership in our communities, thus encouraging self reliance and investment in place. Local ownership would address problems ignored by absentee-owners such as lack of broadband access, slow speeds, limited (if any) provider choice, and aggregation of demand. Communities should be empowered and ultimately held responsible for ensuring they have the networks they need to succeed.

2. There are not five submissions that I disagree with at this time. I need to hear more of the discussion/arguments before I can do that.

I also would like to add the library piece to Kim Ross's section. It doesn't vary much, and I don't disagree with what he's written...just some details to be added. Will there be an opportunity for that?

Gopal Khanna – Five submissions you agree with most: (not in any particular order)

1. Technology neutral – we are not picking a technology (p.5)
2. One size does not fit all (p.7)
3. Public/Private Partnership required with true spirit of cooperation (p.7)
4. In order to stay competitive with other states and with the rest of the world, Minnesota must make a long term commitment to developing and maintaining ultra high-speed broadband capability. (p.35)
5. Open trenches. When road work is done across the state, everything should be done to encourage municipal, county or state officials and private providers to bury conduit and/or dark fiber in the open trench. (p.44)

Five submissions you disagree with most: (Remaining neutral on this one)

Dick Sjoberg 5 Items of Agreement

1. Kim Ross - GOALS p. 40-41

Kim Ross - 1. K-12 and public libraries continue to need a sustained, adequate funding source that is adequate to current needs and allows room for growth. For K-12, the current \$3.75 million in the state's base budget is not sufficient to support reasonable Internet access and distance learning connectivity. School districts are often working with substandard levels of access to support their core business function - to deliver education opportunities and manage the school. Telecommunications access is now

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Kim Ross - 3. In the absence of stable, equitable funding, it has been difficult to establish standards for videoconferencing. For example, while most of the telecommunications access clusters are working towards the H.323 videoconferencing standard with quality of service (QOS), it is difficult for us to reach an efficient level of interconnectivity when local funding availability and eligibility for grants varies so widely.

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Kim Ross - 8. There is a need for understanding and advocacy at the state level for high speed bandwidth that meets the needs of schools and public libraries.

2. Mike O'Connor - Require pricing options without cross-subsidies from video or voice services (page 50)

Mike O'Connor - Artificially low prices for Internet services distort the market and confound the policy making process. Ultra high speed Internet access is a premium service and should be offered in such a way that providers can make a rate of return, while consumers have the option buy the service without having to buy unwanted video or voice services.

3. John Stanoch - Increase Market Demand (p. 21)

In addition to addressing availability of broadband services, there is also a need to address demand. A presentation to the Task Force by Dr. Jack Geller indicated that approximately 30% of Minnesotans do not have a home computer and therefore have no reason to purchase a broadband product. Studies conducted by the Center for Rural Policy Development report that:

- Computer ownership and Internet connectivity throughout Minnesota are relatively flat, or at best modestly increasing.
- Approximately 90% of broadband users are satisfied with the speed of their Internet connection.

p. 45 John Stanoch - Any discussion of Minnesota broadband policy needs to also address market demand. Policy options include:

- Encourage support for programs and initiatives that increase access to broadband and generate demand and use of broadband.
- Discourage new taxes on broadband and telecommunications services.
- Support investment in public education technology that will benefit students in the classroom and encourage broadband use at home.

Develop a strategy that will encourage e-government initiatives at all levels of government.

4. Vijay Sethi – (page 34)

Redundancy to insure broadband service reliability: As high speed broadband fiber becomes the medium for the communication of vital functions such as police, dispatch and ambulance services, phone service, telemedicine services etc. a backup system needs to be available in the event of the failure of the primary fiber. This is probably not a major issue in the metro area and other population centers. However, in rural Minnesota a single fiber carrying the vital services to the remote and sparsely populated area of the state without a back-up option creates a major public safety concern

5. Mary Ellen Wells – (Page 35-36)

First, Access. Currently, there are many throughout the state who could reap many benefits from having reasonably-priced high speed internet available to their organizations and homes. For example, the lack of and the high cost of high-speed broadband can limit a hospital or senior care center from offering many of the technologies that exist. Individuals who live outside population centers could have Home Care applications or could telecommute for a wide variety of business functions (Coders, Billers, Transcriptionists). As a result, economic opportunities are thwarted and people must travel great distances to receive care that could be offered closer to home.

Mary Ellen Wells - Second, Quality. We've learned that high-speed broadband provides organizations the opportunity to offer advanced specialty services through telehealth applications such as the eICU, telepsychiatry, and teleradiology. These and other similar applications bring highly trained specialists to communities that cannot otherwise offer these services. As a result, patients are treated earlier in their disease process and also keep patients in their community. Additionally, the proliferation of eHealth records can greatly improve the

Mary Ellen Wells - Third, Cost. Everyone is experiencing the growing cost of health care. As the baby boomers age, health care costs are projected to increase far above what the current model can support. Telehealth services, that require high-speed broadband, can support the changes that are needed in the current health care delivery system. For example, by providing high-speed broadband access to every home, the current health care model can change. Home monitoring and Home health care applications can prevent acute illness that drives costs up. Also, having people leave their homes and communities to seek specialty care is extremely costly. Patients as well as family members must often take time off of work and be away from home when they must travel for care that is not offered locally.

Mary Ellen Wells - Refer to the March 24, 2009 Panel discussion for more detailed information on concepts and applications that utilize High-Speed Broadband.

6. Brent Christensen - p. 49.

The 1934 Telecom act also addressed affordability. Because of the importance of broadband access, economic factors must be addressed. Existing low income programs should be expanded to assist low income families with access to broadband. Geography and economics should not be a barrier to access.

Brent Christensen - Since it is not feasible to scrap the existing network and start over, the government should provide economic incentives for providers to build out their networks. Sales tax exemption for

broadband equipment purchased and deployed, similar to existing telephone equipment purchases is but one example.

Brent Christensen - Deployment of broadband is only one side of the equation. The state needs to provide incentives for consumers to adopt the technology. Just adding monthly broadband service to the existing list of qualifying tax deductions would be one way to encourage adoption. Another option would be to offer state funded rebates for computer purchases for low income, students, and the elderly.

Dick Sjoberg – Five items of disagreement:

1. Provision of Service by Public Entities.

p. 21 Leaders in the US

Mike O'Connor - Lafayette, Louisiana

In 2009 started providing retail telecommunication services to residential and smaller business customers, at 20% less than the standard competitor. But the vision is to provide much more than basic TV and phone services. The city provides triple play for \$85. For \$138 you get 250 channels (including HD) and 30MB up and down Internet. Customers can build their own bundle. E.g., unlimited long distance for \$31. Five cents a minute to reach much of the world. They also provide 100Mbps for peer-to-peer within their network for free.

Mike O'Connor - UTOPIA

15Mbps/15Mbps plan at \$40/mo or 50Mbps/50Mbps for \$55/mo from either MSTAR or XMission over UTOPIA infrastructure.

Mike O'Connor - Loma Linda, CA

* 5 Mbps - \$29.95 per Month

* 10 Mbps - \$49.95 per Month

* 15 Mbps - \$99.95 per Month

Mike O'Connor - Seattle, WA (Highlands Fiber Network)

Tech Guru - 20Mbps/20Mbps

\$94.90 per month for download speeds up to 20Mbps and upload speeds up to 20Mbps.

Note from Dick: If we are going to list municipal case studies let's list them all, provide in-depth analysis, not cherry pick recent launches with no verifiable experience or financial history.

p. 44 -45. Tom Garrison - Just as it does with all other forms of critical infrastructure (roads, bridges, airports, building codes, electrical supply, telephone service, etc.), state government has a vital role to play in terms of setting policy and regulations that are in the public interest and protect public safety. Regarding improving the speeds, availability, and affordability of broadband services, all state barriers to the provision of broadband service by public entities should be removed as long as such provision is the wish of a plurality of that's jurisdiction's citizens. There should be no discrimination between public and private entities in their ability to provide broadband services. Many municipalities will have no interest in the direct provision of service unless the market is unwilling or unable to provide the services communities feel they need to survive and thrive in the global marketplace. The state should recognize that no one size fits all and no singular tactic can achieve the state's broadband goals, without all interested stakeholders-existing providers, new entrants, and communities of interest-being able to pursue their economic future and broadband goals. Municipalities-those closest to their citizens-have an important role to play in convening community broadband conversations and planning with their local business community. Further, municipalities have a crucial role to play in potentially spreading out the cost and speeding up the timetable of broadband improvements by virtue of their bonding authority which can facilitate 20-30 year return on investments, rather than having to meet strict 1-3 year ROI. Policymakers should consider utilizing this powerful tool by explicitly permitting public/private partnerships

that further ultra high-speed broadband goals. Policymakers should also reaffirm municipal authority to require conduit installation. Just as cities have an interest in the so-called “last mile” closest to them, the state has an indispensable interest in the necessary “middle mile” connections to its citizens and localities that ensure both security and redundancy in those essential connections, sustain business commerce and jobs, provide e-government functions, and protect vital networks and data from outside vulnerability and attack.

p. 51 - Mike O'Connor - Encourage local ownership

Mike O'Connor - Incentives should be created to encourage local and public ownership. For example, local providers, Tribal governments, community-based nonprofits, utilities, and co-ops should get incentives to construct, own, improve, maintain, and operate broadband facilities and to provide broadband services.

2. Broadband is not a fundamental human right.

Mike O'Connor - pp 8-9 Communication is emerging as a fundamental human right. Mike O'Connor - As the nation moves forward in new ways with advanced digital communications, broadband access becomes a fundamental human right. Lack of access to broadband denies people the fundamental human right to communicate. Without broadband, people are further isolated from the new model of economic and civic participation, thus, diminishing antipoverty efforts. Economic distress in Minnesota communities - lack of jobs, inadequate education, poor healthcare, outflow of local talent, etc. - is exacerbated by the inability to communicate. Broadband is no longer a luxury but a vital service necessary to fully participate in the nation's democracy, economy, culture, and society. As the nation moves forward in new ways with advanced digital communications, broadband access becomes a fundamental human right. Acknowledging and protecting this right will provide more resources for rural areas to improve economic conditions and advance with the rest of the nation.

3. Overstated and Undocumented Need for Ubiquitous Fiber.

p. 5 Vijay Sethi - Based on the information presented so far, extending the fiber ultra high-speed broadband to every home and business appears to be the only way to address the burgeoning bandwidth demands of the future.

p. 30 Tom Garrison If Minnesota is serious about achieving ultra high speed broadband, we must acknowledge that fiber optic delivery is the only known system today capable of two-way symmetrical transmission. While remaining open to other technical advances that can achieve higher speeds or capacity, our goal by 2015 should be full fiber deployment to every home and business, to every community, in the state.

4. Speed Goals and Definitions

p. 27 Peg Werner - Tiered levels of 3mbs, 10mbs and 100mbs might be a suggested starting place.

p. 29-30 Rick King. Providers should offer three or four price levels dependent on applications. Consumers could self-select what level they want. For instance:

- Power User - 100 Mb or more
- Home Business - 40-50 Mb
- General Home User - 10-20 Mb
- Lite, Casual User - 5-10 Mb

p. 32 Chris Swanson. A 10% discrepancy between the upload and download speeds should be the maximum difference.

p. 46 Mike O'Connor - Change the definition of broadband speed

Mike O'Connor - The standards of speed for broadband access must first rest on symmetrical upload and download rates. This technical definition implies that our networks must make it as easy to produce content as it is to consume. The standard of speed in networks should weight the upload speed over the download speed to ensure participation.

Mike O'Connor - The standard of speed is also changing, we should not be locked in a regulatory framework that limits us to obsolete technology. Instead government should promote and fund networks that offer a high quality of service, low-latency networks, and the functionality to meet the service and application needs of our communications future.

Mike O'Connor - The electrical grid is designed to work on the hottest day of the year. Yet many broadband systems become bogged down at peak times, offering the worst performance when the networks are most needed. For this reason, the speed threshold should be specified in terms of peak and non-peak speeds. A network that offers fast speeds only in the middle of the night does not benefit the state as much as one designed to ensure higher quality of service around the clock.

Text Added to Outline p. 2.

3 tiers – (various ranges are being considered for need) for all of the State of Minnesota, for all purchaser types, (see the writings submitted below):

- High – 100 Mbps – 1 Gbps (or greater), 1 Gbps or greater, 100 Mbps – 500 Mbps
- Medium – between low and high
- Low Minimum of 100 Mbps, 50 Mbps, 25 Mbps, 10 Mbps

Symmetrical – we need to symmetrical service for all

5. Deletion of need for a mobile internet strategy.

p. 5-6. Mike O'Connor - ~~Our international rivals have built fast, universal networks using both wired and wireless technologies. If we are to regain our position of dominance in the world, it can only be by avoiding the wireless OR wired question and finding a means to provide both. Wired for speed and reliability, wireless for mobility. We acknowledge that one size does not fit all with regard to broadband delivery. A mix of wired and wireless services will probably be required to reach remote and low-density locations. Indeed, experience in many places indicates that perhaps we should focus on mobile broadband as a gateway technology for underserved citizens. Mobile devices are everywhere. They have long surpassed the Internet in number of users, and in some parts of the world, mobile phones now rival television in reach. Access to quality mobile devices and services often determines the socio-economic future of a community. Many people do not have and cannot afford private access to computers or the internet. A principle of openness should include a recognition of the importance of Mobile devices as public access points. Minnesota should require improvements to Internet service that people already have, as well as increasing access to other affordable, quality, mobile devices and services.~~ At the same time we do not wish to see Minnesota allocate resources to promoting or sustaining outdated and obsolete technologies when it is clear that these technologies will not provide the speeds and capabilities we seek for the future and are projected to see declining penetration and market-share (Dataquest).

Note from Dick: The highlighted section should be restored.

Craig Taylor – The 5 I agree with (the most)

1. Technology neutral – we are not picking a technology

Jack Geller - Through our own research, as well as through provided testimony, it is quite evident that Minnesotans receive and will continue to receive their broadband services through a variety of delivery technologies, both wired and wireless. And while many have suggested that some technologies may be more “future-proof” than others, the Task Force believes that identifying specific delivery technologies in public policy is undesirable. Such recognition may stifle competition and innovation among providers, both public and private. Equally important, is the belief of the Task Force that the role of government is to remain technology neutral; allowing innovation, investment and consumer choice to dictate how Minnesota residents, businesses and communities access broadband services.

2. Broadband is essential infrastructure

Mike O'Connor - Broadband is critical infrastructure for Minnesota's 21st century advancement in education, health, public safety, research & innovation, economic diversification and public services. The

task force recommends that Minnesota establish minimum threshold of service that should be available to all Minnesotans and a forward-looking vision that positions the State for global competitiveness.

3. Bring service to those who want it among the unserved and underserved

Dick Sjöberg - **The lack of demand for broadband service is usually not caused by a lack of availability.** A paper by the Technology Policy Institute (TPI) cites a 2007 study by Parks Associates finding that 29% of U.S. households are not planning to subscribe to a broadband service. Of those not planning to subscribe to broadband, only 3% said it was because Internet was not available to them. Seven percent (7%) of those not planning to subscribe cited affordability as the reason. Fourteen percent (14%) of those not planning to subscribe said they could not afford a computer. Forty-four percent (44%) said they did not want to have anything to do with the Internet. TPI concludes that from a policy perspective, spending a lot of public money on infrastructure will not affect household penetrations rates. Instead, policy makers should consider targeting subsidies at low-income consumers who would subscribe if they could afford the service. Programs designed to provide computers to low-income populations through public libraries or "community technology centers" also make sense. ***Make sure footnotes get added ***

S. Walsten, "Understanding International Broadband Comparisons," at p. 12 (Technology Policy Institute May 2008)(herein "TPI Report"). Id. Id. at 12 (Figure 5). Id. Id. Id. at 13.

4. Encourage Competition

Chris Swanson - Competitive - We should encourage anyone who wants to build the Ultra infrastructure to do so including governmental, private owned and publicly traded entities. Much like the highways that allow anyone with a valid license to navigate them, our networks should allow for competition. FedEx and UPS compete on the same highway with DHL because the highway is available for public use. Competition is good when it comes to delivering Ultra High-Speed services because it keeps prices down, innovation up, and customer service at its best. No private service provider should be forced to have an open network, because they have paid to have that network built out. However, if public funds are used the network should require competition. Although we are not certain how competition should be allowed on each network any entity that builds a voice, data, or video network will be competed against because the Internet allows consumers and businesses to purchase services from anyone in the world. We should discourage monopolies and dualopolies and allow choices of service for those purchasing products. We should also require that all providers, public or private, should clearly define what their fair use policies are. Value - Competition on the networks is healthy and should be encouraged for the best in innovation, customer service, and pricing. Tiered pricing should be available as part of network management.

5. Symmetrical speeds are required going forward

Chris Swanson -Uploading data as well as downloading data need to be considered as an important value. The internet was built to allow for two way communications and has turned into downloading being weighted heavier than uploading. We do not place enough of a value on creating the data that we are uploading. When this data is being created or shipped it is being uploaded. There are a growing number of applications which require a symmetric connection in order for the product to work correctly. A growth market such as video applications, require faster symmetrical bandwidth. We cannot afford to stifle innovation, product quality and ability to get product to market because our upload speeds are far slower than our download speeds. Value- Based on the trends of video, data creation and the opportunity for business growth and communication we should value symmetrical connections. A 10% discrepancy between the upload and download speeds should be the maximum difference. Video growth creates a clear need for symmetrical internet connectivity.

Craig Taylor – The 5 I don't agree with (the most)

1. Local ownership, self reliance, and investment in community.

Mike O'Connor - Absentee-ownership of broadband infrastructure and service has failed to deliver universal high speed broadband networks. Non-local corporations have sometimes failed to invest in infrastructure because some areas will not offer the level of return available from wealthier, more densely populated markets. Minnesota broadband policies should prioritize local ownership in our communities,

thus encouraging self reliance and investment in place. Local ownership would address problems ignored by absentee-owners such as lack of broadband access, slow speeds, limited (if any) provider choice, and aggregation of demand. Communities should be empowered and ultimately held responsible for ensuring they have the networks they need to succeed.

2. Increase Market Demand

We don't agree this will be the case in 2015 (Group 1)

John Stanoch -In addition to addressing availability of broadband services, there is also a need to address demand. A presentation to the Task Force by Dr. Jack Geller indicated that approximately 30% of Minnesotans do not have a home computer and therefore have no reason to purchase a broadband product. Studies conducted by the Center for Rural Policy Development report that:

- Computer ownership and Internet connectivity throughout Minnesota are relatively flat, or at best modestly increasing.
- Approximately 90% of broadband users are satisfied with the speed of their Internet connection.

3. Speed & Connections of Critical Infrastructure

Tom Garrison - If Minnesota is serious about achieving ultra high speed broadband, we must acknowledge that fiber optic delivery is the only known system today capable of two-way symmetrical transmission. While remaining open to other technical advances that can achieve higher speeds or capacity, our goal by 2015 should be full fiber deployment to every home and business, to every community, in the state. Noting that Minnesota is rated today as 23rd in average Internet speeds, 25th in Unique IP addresses per capita, and 26th in High Broadband IP's per capita (defined as speeds >5Mbps), our goal must be to dramatically improve connections, speeds and affordability of services. To become and remain globally competitive in the emerging knowledge-based economy, and to position our state as a center of innovation and employment, Minnesota's should adopt a goal of always being in the top three states nationwide and among the top five locations in the world in average available Internet speeds. These speeds and connections are both in the national and state interest, and all means necessary must be pursued to achieve them. Broadband must also, therefore, be defined in law as critical infrastructure.

4. Establishment of continuing authority in the state

Rick King - The State should create an on-going commission to identify issues and solutions for ubiquitous broadband adoption in Minnesota. This commission and its members should be appointed by the governor and have regular meetings, staff support and funding. It would be charged with the implementation of the Task Force's report and other outcomes from any federal stimulus money.

5. Demand Should Drive Investment.

Dick Sjoberg - a. As the Connected Nations inventory mapping for Minnesota shows, market forces have worked well in developing Minnesota's broadband infrastructure. However, there is little macro level research regarding levels of demand for broadband service in Minnesota. To the extent empirical evidence pertaining to demand exists, the data indicates there is not yet sufficient demand to support mass-market deployment of broadband speeds over 50 Mbps. The only conclusion that can be fairly drawn given the data available to the Task Force is that where adequate demand exists for broadband services, the private sector has delivered.

Brent Christensen – FIVE SUBMISSIONS I AGREE WITH MOST

1. Rick King - Providers should offer three or four price levels dependent on applications. Consumers could self-select what level they want. For instance:
 - Power User - 100 Mb or more
 - Home Business - 40-50 Mb
 - General Home User - 10-20 Mb

- Lite, Casual User - 5-10 Mb

2. Peg Werner - High-speed broadband access should be available to all Minnesotans at the place of work, in their schools, libraries and hospitals and at their primary residences. Geographic location should not be a barrier to bandwidth availability, speed of transmission or quality of service. Viewing broadband access as an essential service will improve the quality of life for Minnesotans and the businesses that choose to locate here. High-speed broadband facilities will provide access to essential information and services offered online, to healthcare providers in distant locations, to online educational opportunities, to informational and entertainment materials and resources, and to connections to businesses, customers and suppliers around the world. Not providing broadband access will put Minnesota at a distinct disadvantage as people choose locations to raise their families or to retire and businesses choose locations in which to locate and operate. Treating broadband access as a utility, as part of the common good will move Minnesota forward in the lives of both its businesses and its citizens. In addition to guaranteeing broadband access throughout the state, it is necessary to ensure that access be affordable to everyone. A tiered level of service would offer varying intervals of bandwidth to meet various business and consumer needs. Subsidies to providers in areas where provision of broadband is more expensive and/or less profitable would ensure that broadband can be deployed across the state. Access for those unable to afford even a nominal cost, including hardware, software, broadband access and training, must be provided for by public agencies.
3. Rick King - It is the task force's view that municipal ownership of broadband delivery should be a last resort prompted by the unwillingness of existing or new providers to service the area with appropriate minimum speeds and cost efficient prices.
4. In order to accomplish the goal of ultra high-speed broadband deployment throughout the state of Minnesota, both private providers and state government are going to have to approach the project with a true spirit of cooperation. Although local governments may choose to be providers, the role of the state government should be that of administration, education and regulation. The state could demonstrate an immediate interest by facilitating the collection of data necessary to providing accurate detail of broadband services already in place. The private sector could indicate their interest in cooperation by providing the data sought.

The state should minimize its impact on market competition and use legislation to address impediments to availability of access. Through building code modification, tax incentives, standards for broadband access and interoperability requirements, the state can provide leadership to the industry in the initial deployment of the network. . The state should continue its regulatory role with appropriate oversight of the public and private industry providers. The state can also assume a leadership role in providing grants and low-cost loans to those providers building initial connections in unserved/underserved, high-cost service areas of the state. Both the state and the providers can work together to stimulate demand for the services through education and training of the general populace and in promoting economic development in light of the availability of broadband access throughout the state of Minnesota.

5. Mike O'Connor - Our international rivals have built fast, universal networks using both wired and wireless technologies. If we are to regain our position of dominance in the world, it can only be by avoiding the wireless OR wired question and finding a means to provide both. Wired for speed and reliability, wireless for mobility. We acknowledge that one size does not fit all with regard to broadband delivery. A mix of wired and wireless services will probably be required to reach remote and low-density locations. Indeed, experience in many places indicates that perhaps we should focus on mobile broadband as a gateway technology for underserved citizens. Mobile devices are everywhere. They have long surpassed the Internet in number of users, and in some parts of the world, mobile phones now rival television in reach. Access to quality mobile devices and services often determines the socio-economic future of a community. Many people do not have and cannot afford private access to computers or the internet. A principle of openness should include a recognition of the importance of Mobile devices as public access points. Minnesota should require improvements to Internet service that people already have, as well as increasing access to other affordable, quality, mobile devices and services. At the same time we do not wish to see Minnesota allocate resources to promoting or sustaining outdated and obsolete technologies when it is clear that these technologies will not provide the speeds and

capabilities we seek for the future and are projected to see declining penetration and market-share (Dataquest).

(It should be noted that I don't agree with the way Mike wrote this, but I do agree with the concept)

Brent Christensen – FIVE SUBMISSIONS I DISAGREE WITH MOST

1. Mike O'Connor - One needed policy shift is to view broadband as essential infrastructure rather than leaving it to be deployed only when private investors believe they can obtain favorable returns relative to other opportunities for their capital. The task force notes that we do not leave private investors solely responsible for the financing and decisions concerning when and where to deploy other shared infrastructure such as roads, highways, sewers, water and power distribution systems.
2. Mike O'Connor - As the nation moves forward in new ways with advanced digital communications, broadband access becomes a fundamental human right. Lack of access to broadband denies people the fundamental human right to communicate. Without broadband, people are further isolated from the new model of economic and civic participation, thus, diminishing antipoverty efforts. Economic distress in Minnesota communities - lack of jobs, inadequate education, poor healthcare, outflow of local talent, etc. - is exacerbated by the inability to communicate. Broadband is no longer a luxury but a vital service necessary to fully participate in the nation's democracy, economy, culture, and society. As the nation moves forward in new ways with advanced digital communications, broadband access becomes a fundamental human right. Acknowledging and protecting this right will provide more resources for rural areas to improve economic conditions and advance with the rest of the nation.
3. Tom Garrison - If Minnesota is serious about achieving ultra high speed broadband, we must acknowledge that fiber optic delivery is the only known system today capable of two-way symmetrical transmission. While remaining open to other technical advances that can achieve higher speeds or capacity, our goal by 2015 should be full fiber deployment to every home and business, to every community, in the state. Noting that Minnesota is rated today as 23rd in average Internet speeds, 25th in Unique IP addresses per capita, and 26th in High Broadband IP's per capita (defined as speeds >5Mbps), our goal must be to dramatically improve connections, speeds and affordability of services. To become and remain globally competitive in the emerging knowledge-based economy, and to position our state as a center of innovation and employment, Minnesota's should adopt a goal of always being in the top three states nationwide and among the top five locations in the world in average available Internet speeds. These speeds and connections are both in the national and state interest, and all means necessary must be pursued to achieve them. Broadband must also, therefore, be defined in law as critical infrastructure.
4. Robyn West - The market alone has not provided adequate high-speed broadband. It is difficult and cost prohibitive for either the public or private sectors to be the sole provider of high-speed broadband. By partnering together, public and private sectors can bring greater opportunities for widespread penetration of high-speed broadband to entire communities, including under served and unserved markets. An example of how this could be achieved includes having a government entity fund high-speed broadband infrastructure, allowing private service providers, for a fee, to utilize this infrastructure for their provision of broadband services. This partnership approach can result in providing widespread access to communities while encouraging market competition for the provision of high-speed broadband.
5. Mike O'Connor - "Unserved" is a more extreme example of underserved. Unserved is a population wherein more than 20% of the households and/or businesses lack broadband access at a reasonable price, or are underserved. In many rural areas, population centers may have access while those outside political boundaries do not. Setting an "unserved" bar too high would result in unnecessarily increasing the cost of building a network that would only go after those without service. A bar at 20% makes networks more feasible, by allowing the network owner to incorporate adjacent communities with greater densities, which are likely to already have service.

Ubiquity of Ultra High Speed

Page 43

Vijay Sethi - Role of government in facilitating the ubiquity of Service

Vijay Sethi - Local, state and federal governments have a critical role to play in achieving ubiquity of ultra high speed broadband service in Minnesota. The private sector business models, based on cost/benefits scenarios, are very effective in serving the needs of the geographic areas - metro as well as rural- with adequate population densities that allow reasonable returns on investments and where the users can afford to pay for the services. There is little incentive for the private companies to serve those areas which do not have the “critical mass” of paying customers. State Local governments can play a major role by 1) Identifying the unserved and underserved areas, 2) serving as the information clearinghouse for available resources and infrastructure , 3) developing collaborative partnerships among public, and private sector participants aimed at maximizing the use of existing infrastructure owned and operated by private and public partners, 4) helping to navigate through the regulatory process and 5) assisting with financial incentives and funding opportunities available at the local, regional, state and federal levels. Additionally, at the state and federal levels, the government’s role is to enact policies that encourage public/private partnerships, and to provide financial resources aimed at providing the ultra high speed broadband to the unserved and underserved part of the state as well as financially disadvantaged persons and households.

Government involved in broadband

Page 44

Tom Garrison - Role of Government

Tom Garrison - Just as it does with all other forms of critical infrastructure (roads, bridges, airports, building codes, electrical supply, telephone service, etc.), state government has a vital role to play in terms of setting policy and regulations that are in the public interest and protect public safety. Regarding improving the speeds, availability, and affordability of broadband services, all state barriers to the provision of broadband service by public entities should be removed as long as such provision is the wish of a plurality of that’s jurisdiction’s citizens. There should be no discrimination between public and private entities in their ability to provide broadband services. Many municipalities will have no interest in the direct provision of service unless the market is unwilling or unable to provide the services communities feel they need to survive and thrive in the global marketplace. The state should recognize that no one size fits all and no singular tactic can achieve the state’s broadband goals, without all interested stakeholders-existing providers, new

entrants, and communities of interest-being able to pursue their economic future and broadband goals. Municipalities-those closest to their citizens-have an important role to play in convening community broadband conversations and planning with their local business community. Further, municipalities have a crucial role to play in potentially spreading out the cost and speeding up the timetable of broadband improvements by virtue of their bonding authority which can facilitate 20-30 year return on investments, rather than having to meet strict 1-3 year ROI. Policymakers should consider utilizing this powerful tool by explicitly permitting public/private partnerships that further ultra high-speed broadband goals. Policymakers should also reaffirm municipal authority to require conduit installation. Just as cities have an interest in the so-called "last mile" closest to them, the state has an indispensable interest in the necessary "middle mile" connections to its citizens and localities that ensure both security and redundancy in those essential connections, sustain business commerce and jobs, provide e-government functions, and protect vital networks and data from outside vulnerability and attack.

Minnesota should set the bar high and promote networks that are equal to or better than the current leaders. Minnesota should lead.

Page 22

Mike O'Connor - Lafayette, Louisiana

In 2009 started providing retail telecommunication services to residential and smaller business customers, at 20% less than the standard competitor. But the vision is to provide much more than basic TV and phone services. The city provides triple play for \$85. For \$138 you get 250 channels (including HD) and 30MB up and down Internet. Customers can build their own bundle. E.g., unlimited long distance for \$31. Five cents a minute to reach much of the world. They also provide 100Mbps for peer-to-peer within their network for free.

We are not sure if the cost of long distance is relevant to this report since it does not involve broadband. We are not sure, since this is new (2009), whether this business plan is sustainable or involves any subsidies from government.

Since triple-play convergence packages are a big part of most broadband offerings, long-distance is relevant.

Mike O'Connor - UTOPIA

15Mbps/15Mbps plan at \$40/mo or 50Mbps/50Mbps for \$55/mo from either MSTAR or XMission over UTOPIA infrastructure.

Mike O'Connor - Loma Linda, CA

** 5 Mbps - \$29.95 per Month*

** 10 Mbps - \$49.95 per Month*

* 15 Mbps - \$99.95 per Month

Mike O'Connor - **Seattle, WA (Highlands Fiber Network)**

Tech Guru - 20Mbps/20Mbps

\$94.90 per month for download speeds up to 20Mbps and upload speeds up to 20Mbps.

Remove the barrier to slowing deployments of infrastructure

Page 51

John Stanoch - Eliminate of Barriers to Deployment: Minnesota broadband policy should eliminate barriers to deployment of advanced telecommunications services. For example:

- Limit Right-of-Way fees to the costs of managing the public asset.
- Establish an expedited process to resolve Right-of-Way issues.
- Include the cost of relocating utility facilities in street, highway and other infrastructure projects.
- Eliminate regulatory uncertainty.
- Address Cost-of-entry issues, particularly in low population density areas.
- Eliminate laws and rules that treat broadband providers differently based on the technologically used to deliver telecommunications services.

Broadband is essential infrastructure.

Page 8

Mike O'Connor - **Broadband is essential infrastructure**

Mike O'Connor - Broadband is critical infrastructure for Minnesota's 21st century advancement in education, health, public safety, research & innovation, economic diversification and public services. The task force recommends that Minnesota establish **minimum threshold of service that should be available to all Minnesotan's** and ~~an aggressive~~ and forward-looking vision that positions the State for global competitiveness.

The legislature should consider public/private partnership models in unserved areas of the state where private investment may not be providing service due inability to recoup a return on capital investment. Mike O'Connor - One needed policy shift is to view broadband as essential infrastructure rather than leaving it to be deployed only when private investors believe they can obtain favorable returns relative to other opportunities for their capital. The task force notes that we do not leave private investors solely responsible for the financing and decisions concerning when and where to deploy other shared infrastructure such as roads, highways, sewers, water and power distribution systems. ~~Mike O'Connor - One needed policy shift is to view broadband as essential infrastructure rather than leaving it to be deployed only when private investors believe they can obtain favorable returns relative to other opportunities for their capital. The task force notes that we do not leave private investors solely responsible for the financing~~

~~and decisions concerning when and where to deploy other shared infrastructure such as roads, highways, sewers, water and power distribution systems.~~

In unserved areas of the state our citizens are at a disadvantage in our global economy and broadband

Chris Swanson – Five Submissions I disagree with most

Mapping doesn't achieve an Ultra goal. It is subject to data that is not easily accessible for the general public to review for accuracy, and quite frankly I just don't buy what I saw from the connected nation report. (We can make numbers say what we want them to) Also the
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John Gibbs - With a relatively light regulatory touch, some of Minnesota's broadband achievements over the past ten (10) years include the Connected Nation preliminary report that concludes 92% of Minnesota households have access to broadband. Connected Nation expects their final report to show that 94% of Minnesota households have access to broadband services. Applying this data to the Organization for Economic Co-operation and Development (OECD) broadband report, which ranks countries' broadband penetration each year, Minnesota not only leads the country with respect to broadband penetration, it leads the world. Additionally, the average download speed in Minnesota is 6.5 Mbps, higher than any other state studied by Connected Nation. Minnesota has several broadband providers providing services that far exceed the national average for download speeds and 55% of adult Americans have broadband access at home. According to Crandall & Jackson's estimates back in 2001, the U.S. is well on track to add \$500 billion in added productivity to the American economy by 2025. Broadband connections in U.S. are growing at a rate of 17% per year and broadband prices are declining. There are no less than eight (8) different modes of broadband technology identified in the FCC's Fifth Report. Where cable operators are able to provide cable television service, high-speed data service is available to 96% of those customers. In Minnesota, where cable operators are able to provide cable television service, high-speed data service is available to 94% of those customers. Where telephone companies offer telephone service, DSL service is available to 82% of those customers. In Minnesota, where telephone companies offer telephone service, DSL is available to 85% of those customers. Comcast is offering 50 x 5 Mbps service to customers in Minneapolis/St. Paul. DOCSIS 3.0 is already being tested in labs to provide download speeds of up to 320 Mbps. Just 9 years ago, Minnesota policy makers were calling for "speed standards" of 256 Kbps. Each month cable operators deliver over 418 Terabytes of voice, video and data content into each subscriber's home. Also, WiMAX services are coming. In May 2008, six (6) of the largest telecommunications/IT companies in the country announced a joint venture, called Clearwire. "The partnership of such fundamentally different companies underscores the convergence of Internet, entertainment and telecommunications services. The wireless network of the future is expected to be fast enough - rivaling speeds that cable customers have in their homes today - to allow delivery not just of text and simple Web pages, but of video and advertising." Wireless technologies could be the key to serving the unserved. The national market for high-speed lines (as defined by the FCC) is competitively split between cable (34.1%), DSL (27.3%), and other technologies (36.2%). The U.S. is ranked 4th in the World Economic Forum's Networked Readiness Index, a much broader picture

(compared to OECD rankings) of how countries leverage investment in information, communications, and technology infrastructure taking into account both economic and demographic factors. There are 98 providers of high-speed data service in Minnesota. ***Need to make sure these footnotes get added back in*** J. Horrigan, "Home Broadband Adoption 2008," Pew Internet & American Life Project (July 2008)(herein the "Pew Internet Study, at i. R. Crandall and C. Jackson, The \$500 Billion Opportunity: The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access, p. 4, Figure 2 (Criterion Economics, LLC July 2001). Pew Internet Study, at i. Id. at ii. In re Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, GN Docket No. 07-45, pp. 5-13 (2008)(herein "Fifth Report"). High-Speed Services for Internet Access: Status as of June 30, 2007, Industry Analysis and Technology Division, p. 3 (March 2008)(herein " FCC 2008 Broadband Status Report"). Id. Id. Id. See DOCSIS 3.0 Cable's Game Changer? p. 2 (Wachovia Equity Research)(herein "Wachovia Research"). D. Diers, "Cable TV Report: DOCSIS 3.0," Presentation to Minnesota Broadband Task Force (December 19, 2008). M. Richtel, "Technology Group Plans Wireless Offering," New York Times (May 7, 2008). FCC 2008 Broadband Status Report, Chart 3. World Economic Forum, "The Global Technology Report 2007-2008," at p. 4 (2008). FCC 2008 Broadband Status Report, Table 8.

We have some idea of availability of broadband, however we are not sure how and who is using it and for what purpose (entertainment, media, business, etc)

The use of the access is part of the value proposition as far as willingness of users to pay for the service and the government to expand the service.

Some members of the task force recognize that carriers have a large stranded investment that they need to protect, we just need to protect it in such a way that maintains Minnesota's competitive position.

As a task force we need to establish a minimum speed. This argument below says everything is fine. I respectfully disagree.

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John Gibbs - Any establishment of a singular level of broadband service as a goal for the State must be based on evidence of demand for that level of service on a statewide basis. The Task Force has only an assortment of anecdotal information about demand for broadband, some positive and some negative. There is no evidence that the private sector has over-invested in broadband infrastructure. There is no evidence the private sector has underinvested. Establishing a goal for broadband service that is too high runs the risk of significant stranded investment - in other words, facilities that no one uses. If the goal is set too low, the State runs the risk of significantly underserving populations within the State of Minnesota who cannot obtain access to a basic level of broadband service. Given the lack of any evidence of the levels of broadband service demanded throughout the State, the Task Force recommends that any goal for a base level standard of broadband service in Minnesota be based on a basic level of functionality that the State desires be available to every person in the State. The task force believes

this functionality should include the ability to e-mail and surf the web at download speeds of at least 1.544 Mbps.

Government should be involved in broadband if it creates competition.

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John Gibbs - The United States has made a deliberate policy choice with respect to broadband to rely predominantly on free market enterprise and the private sector to provide broadband services where demand exists. Government should intervene in an appropriate manner when markets fail to serve areas that are not profitable to serve, or those who cannot afford broadband. (or the private enterprise is acting in a monopolistic-unresponsive to the customer needs manner) These problems require relatively modest government responses, not a fundamental philosophic change in policy. Yet, there are obstacles to investment that the State needs to address. There are many reasons why a business or a household is not using broadband services. A small portion of areas in Minnesota lack of physical access to broadband facilities. Any use of public funding to provide broadband access to unserved areas and underserved populations should also operate under a rule that requires the use of the most cost efficient technology. Combinations of technology platforms should be used to achieve Minnesota's broadband goals in the most cost efficient way possible.

We need to define Ultra High Speed. I do not believe any other state broadband task force has done this so we are being leaders in defining what Ultra broadband is. I respectfully disagree with the definition below.

Page 57

Dick Sjoberg - Ultra high speed broadband. The level of broadband service needed in the future subject to supply and demand, technological developments, and economic conditions.

I disagree that we are the leader in broadband in Minnesota and the premises below that use the connected nation data as the argument. The most current data is subject to interpretation with data that seems to be questionable. I respectfully disagree with the findings below because they operate on the premise that what I am hearing from my neighbors, constituents, friends, and family is inaccurate. Maybe the people I am talking about all over Minnesota don't have a clue and the speeds they need are not a necessity, but they seem to believe that the internet is critical to their day to day operations and the speed of the internet is what impact them the most.

Page 19

Dick Sjoberg - **Minnesota's current leadership position with respect to broadband deployment and availability has resulted from adherence to the following principles:**

Dick Sjoberg - a. **Demand Should Drive Investment.** As the Connected Nations inventory mapping for Minnesota shows, market forces have worked well in developing Minnesota's broadband infrastructure. However, there is little macro level research regarding levels of demand for broadband service in Minnesota. To the extent empirical evidence pertaining to demand exists, the data indicates

there is not yet sufficient demand to support mass-market deployment of broadband speeds over 50 Mbps. The only conclusion that can be fairly drawn given the data available to the Task Force is that where adequate demand exists for broadband services, the private sector has delivered. The Task Force defines "adequate demand" to mean markets in which broadband service suppliers are providing services and earning a reasonable return on investment for doing so. The Connected Nations map and inventory has shown that in certain discrete areas, the cost of providing service is too high, and/or the demand for service too small, to justify construction of facilities to serve those customers. In these areas, the market has behaved rationally. It is in these "unserved" areas where government intervention or assistance can help.

Dick Sjoberg - **The lack of demand for broadband service is usually not caused by a lack of availability.** A paper by the Technology Policy Institute (TPI) cites a 2007 study by Parks Associates finding that 29% of U.S. households are not planning to subscribe to a broadband service. Of those not planning to subscribe to broadband, only 3% said it was because Internet was not available to them. Seven percent (7%) of those not planning to subscribe cited affordability as the reason. Fourteen percent (14%) of those not planning to subscribe said they could not afford a computer. Forty-four percent (44%) said they did not want to have anything to do with the Internet. TPI concludes that from a policy perspective, spending a lot of public money on infrastructure will not affect household penetrations rates. Instead, policy makers should consider targeting subsidies at low-income consumers who would subscribe if they could afford the service. Programs designed to provide computers to low-income populations through public libraries or "community technology centers" also make sense. ***Make sure footnotes get added ***

S. Walsten, "Understanding International Broadband Comparisons," at p. 12 (Technology Policy Institute May 2008)(herein "TPI Report"). Id. Id. at 12 (Figure 5). Id. Id. Id. at 13.

Dick Sjoberg - b. **Consumer Choice.** Most residential and business consumers have several different choices among broadband providers in Minnesota. According to the FCC, there are 98 broadband service providers in Minnesota, many of them acting in competition with each other. The market share between DSL, cable, and other broadband platforms is fairly evenly split according to the FCC. The degree of choice available in the business market is probably much greater than it is in the residential market. The task force has collected very little data on the Minnesota broadband business market.

Dick Sjoberg - c. **Acknowledging That Price is a Function of Cost.** Intermodal competition is resulting in price competition as well. Despite this good news, more competitors in the market will not always result in lower prices for consumers. One fundamental economic concept that policy makers tend to ignore is that price is a function of economic cost. The cable and telecommunications industry has invested billions of dollars in plant and equipment over the past ten years in order to provide broadband services. Build-out requirements at the local franchise level have required cable operators to offer service to everyone in the

cable operator's franchised area. Cable operators will not provide service at a price that falls below the economic cost of providing the service.

Karen Smith 5 submissions agree with most:

1. Supply and Demand points

P. 8 Jack Geller top paragraph

Jack Geller - Supply and Demand Connectivity

All of the information and data reviewed by the Task Force continues to reinforce the reality that identified inequities in broadband adoption; accessibility and availability across Minnesota are a function of demographic, socio-economic and geographic factors. Therefore, if we address the infrastructure issues alone, we may meet the desired goal of ubiquity in availability, but it will not yield the desired results of widespread adoption and use. Only by simultaneously addressing the issues associated with both the supply and demand side of this issue will we move Minnesota forward.

Page 19-20 Dick Sjoberg

ii. How we got to where we are today

Dick Sjoberg - Minnesota's current leadership position with respect to broadband deployment and availability has resulted from adherence to the following principles:

Dick Sjoberg - a. **Demand Should Drive Investment.** As the Connected Nations inventory mapping for Minnesota shows, market forces have worked well in developing Minnesota's broadband infrastructure. However, there is little macro level research regarding levels of demand for broadband service in Minnesota. To the extent empirical evidence pertaining to demand exists, the data indicates there is not yet sufficient demand to support mass-market deployment of broadband speeds over 50 Mbps. The only conclusion that can be fairly drawn given the data available to the Task Force is that where adequate demand exists for broadband services, the private sector has delivered. The Task Force defines "adequate demand" to mean markets in which broadband service suppliers are providing services and earning a reasonable return on investment for doing so. The Connected Nations map and inventory has shown that in certain discrete areas, the cost of providing service is too high, and/or the demand for service too small, to justify construction of facilities to serve those customers. In these areas, the market has behaved rationally. It is in these "unserved" areas where government intervention or assistance can help.

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2. Leaders in the U.S.

Agree there should be more information here

p. 22 (HIGHLIGHTED COMMENT THAT FOLLOWS MIKE O'CONNOR'S CITINGS)

More information is necessary to make a determination of sustainability, profitability, and use as a role model. Government should only be providing broadband services as a last resort when the private sector can not or will not implement. Government usually bases its decisions on politics rather than business cases. This comment applies to all the above examples.

The work of Comcast and the cable industry together with Verizon and the telephone industry should be highlighted in this section.

3. Focus on Unserved Areas

P. 26

John Stanoch - The highest priority of the Broadband Task Force should be to bring high speed Internet service to residents and businesses in Minnesota where it is currently unavailable. Expanding broadband access to previously unserved areas will increase the number of Minnesotans using broadband and increase demand for services provided over the Internet. It is inappropriate at this time to focus limited government resources and initiatives on those areas where high speed Internet is available from existing providers. Areas currently lacking a broadband connection tend to be high-cost service areas. Provider incentives are an important way to encourage deployment in high cost areas. Some options to consider include:

- A grant or matching grants program for some portion of the build in a high cost areas. The State of Idaho, for example, provided \$5,000,000 in state grants to eligible providers who deployed broadband service in unserved areas. As one option, a state agency in Minnesota such as the Department of Commerce could be asked to create a technology neutral competitive broadband grant process for unserved areas.
- Tax incentives for broadband deployment.

4. Municipal Ownership as “Last Resort”

P. 44 Rick King - **Municipal Ownership**

It is the task force’s view that municipal ownership of broadband delivery should be a last resort prompted by the unwillingness of existing or new providers to service the area with appropriate minimum speeds and cost efficient prices.

5. Non-interference with private sector

P. 56. John Gibbs - At its February 6, 2009 Special Meeting, the Task Force collaboratively prioritized the values it believes Minnesota should hold as it moves forward in developing broadband policy. There were three clear values that emerged. First, focus on serving the unserved. Second, focus on sustainability - policy initiatives should focus on solutions that will work long term. Third, focus on economic development. The three goals stated below are consistent with these three core values expressed by the Task Force.

1. Minnesota should continue to follow the successful policy of non-interference with the private sector, which has invested heavily in broadband infrastructure in Minnesota, making the State the nation's leader in terms of the percentage of the population with access to broadband, as well as the State with the highest average download speeds in the nation.
2. The focus of any government intervention should be on making broadband available to unserved areas and removing other barriers to broadband utilization

faced by underserved populations, such as lack of access to computers, or affordability for low-income populations.

3. Minnesota should endeavor to provide at least T-1 level service (1.544 Mbps) to every resident of the State.

Karen Smith 5 Submissions we Disagree with Most:

1. Broadband Access is a “fundamental human right”

Page 8 (and elsewhere in document) Mike O’Connor

Mike O'Connor - Communication is emerging as a fundamental human right. Mike O'Connor - As the nation moves forward in new ways with advanced digital communications, broadband access becomes a fundamental human right. Lack of access to broadband denies people the fundamental human right to communicate. Without broadband, people are further isolated from the new model of economic and civic participation, thus, diminishing antipoverty efforts. Economic distress in Minnesota communities - lack of jobs, inadequate education, poor healthcare, outflow of local talent, etc. - is exacerbated by the inability to communicate. Broadband is no longer a luxury but a vital service necessary to fully participate in the nation’s democracy, economy, culture, and society. As the nation moves forward in new ways with advanced digital communications, broadband access becomes a fundamental human right. Acknowledging and protecting this right will provide more resources for rural areas to improve economic conditions and advance with the rest of the nation.

2. Absentee-ownership has “failed to deliver” and we should prioritize “local ownership”

Page 9 (and elsewhere in document) Mike O’Connor

Mike O’Connor - Absentee-ownership of broadband infrastructure and service has failed to deliver universal high speed broadband networks. Non-local corporations have sometimes failed to invest in infrastructure because some areas will not offer the level of return available from wealthier, more densely populated markets. Minnesota broadband policies should prioritize local ownership in our communities, thus encouraging self reliance and investment in place. Local ownership would address problems ignored by absentee-owners such as lack of broadband access, slow speeds, limited (if any) provider choice, and aggregation of demand. Communities should be empowered and ultimately held responsible for ensuring they have the networks they need to succeed.

3. Broadband Must meet Reliability Standards, especially true of wireless networks

P. 48

Mike O'Connor - Broadband networks should have to meet reliability performance standards. Broadband connections are replacing traditional phone lines but do not offer the same high level of uptime. This is especially true of some wireless networks. Networks should meet some reliability metric as part of the performance standards that will be evaluated as part of the oversight designed to prevent fraud and wasteful use of taxpayer money.

4. Mobile devices as public access points Increase access to affordable, quality mobile devices and services

P. 6 Mike O'Connor - Our international rivals have built fast, universal networks using both wired and wireless technologies. If we are to regain our position of dominance in the world, it can only be by avoiding the wireless OR wired question and finding a means to provide both. Wired for speed and reliability, wireless for mobility. We acknowledge that one size does not fit all with regard to broadband delivery. A mix of wired and wireless services will probably be required to reach remote and low-density locations. Indeed, experience in many places indicates that perhaps we should focus on mobile broadband as a gateway technology for underserved citizens. Mobile devices are everywhere. They have long surpassed the Internet in number of users, and in some parts of the world, mobile phones now rival television in reach. Access to quality mobile devices and services often determines the socio-economic future of a community. Many people do not have and cannot afford private access to computers or the internet. A principle of openness should include recognition of the importance of Mobile devices as public access points. Minnesota should require improvements to Internet service that people already have, as well as increasing access to other affordable, quality, mobile devices and services. At the same time we do not wish to see Minnesota allocate resources to promoting or sustaining outdated and obsolete technologies when it is clear that these technologies will not provide the speeds and capabilities we seek for the future and are projected to see declining penetration and market-share (Dataquest).

5. Competition on networks? We should discourage capping bandwidth or any other restrictions that providers can apply on users (Multiple places and comments)

P. 10 Chris Swanson and elsewhere

Chris Swanson - Competitive - We should encourage anyone who wants to build the Ultra infrastructure to do so including governmental, private owned and publicly traded entities. Much like the highways that allow anyone with a valid license to navigate them, our networks should allow for competition. FedEx and UPS compete on the same highway with DHL because the highway is available for public use. Competition is good when it comes to delivering Ultra High-Speed services because it keeps prices down, innovation up, and customer service at its best. No private service provider should be forced to have an open network, because they have paid to have that network built out. However, if public funds are used the network should require competition. Although we are not certain how competition should be allowed on each network any entity that builds a voice, data, or video network will be competed against because the Internet allows consumers and businesses to purchase services from anyone in the world. We should avoid monopolies and dualopolies and allow choices of service for those purchasing products. We should also require that all providers, public or private, should clearly define what their fair use policies are. We should discourage caps based on the amount of usage from each connection. Value - Competition on the networks is healthy and should be encouraged for the best in innovation,

customer service, and pricing. We should be clear that speed caps or usage caps should be avoided.
