In the 21st century, the building of a statewide broadband infrastructure is as essential as the existence of paved roadways, electricity and basic access to water. I commend the governor's commitment to ensure ubiquitous broadband to every corner of the Commonwealth. The following are my thoughts on how to realize this vision which could better position the people and businesses of Massachusetts to be more active in the world economy that continues to be dependent upon a high bandwidth infrastructure.

There are 5 key foundations I believe should drive the effort. Many of these are inspired by my work with OneCommunity, an award winning community driven public-private hybrid fiber/wireless broadband network that covers 22 counties in NE Ohio. In addition to being their Chief Imagination Officer for 2 years of their early development, I was more recently involved in the strategy and proposal development effort that led to a $25 million grant which is presently replicating OneCommunity's successful model to 26 Knight Foundation service communities throughout the US.

Broadband Foundational Recommendations

1) The design of the business and deployment model must be based on **community, residential and business driven applications that drive the use** of the bandwidth.
2) It will take **application champions** in a variety of sectors to ensure the significant adoption and use of this expanded bandwidth.
3) The application portfolio established must combine and build on the **best practices of similar efforts internationally**.
4) The financial investment in the infrastructure should be drawn from **public and private sector anchor tenants** who benefit the most from the deployment; subsequently extending the connections to those close by, making the bandwidth available to those who could benefit but cannot provide the significant investment required for backbone.
5) The design, construction and launch of the infrastructure should reflect a collaborative **multi-vendor** approach that supports the business objectives of the vendors while satisfying the economic development objectives of the community; using coop-etition as the motivation of vendors reaching the most cost and program effective solution.
6) The infrastructure must reflect the **bandwidth needs of the future** and not today.

Applications that Drive Use of Bandwidth

Although it is easy to deploy ubiquitous bandwidth throughout any region and expect immediate adoption, as Massachusetts opens up this valuable information super highway, having only fast email and quick video downloads cannot be the vision to justify the investment. And although just opening up the bandwidth spigot will drive

pockets of inspired entrepreneurs and community innovators to jump in and explore, it will simultaneously take well developed applications in a variety of settings that require extensive bandwidth to best leverage this valuable new communications tool. And to inspire long term expansive adoption, the initial applications deployed should have diversity across the Commonwealth and be driven by early adopter visionaries – some with strong technical acumen, more with application and sector driven passion and knowhow.

Application Champions

In general, people are resistant to change. No matter how advanced we become, there are always those who resist and hold back progress using a variety of stalling and fear techniques. There are however champions of innovation in every public and private sector that are waiting and willing to lead new efforts, initiatives, technologies and approaches that can make what they and their colleagues do everyday better for society. In education, healthcare, economic development, culture and leisure, corporations, entrepreneurial endeavors, fire and safety and everywhere else, there are individuals and organizations that could take on leadership roles in the utilization and pioneering of the use of significant broadband to increase the impact of their fields. And although some feel that there needs to be a standard deployment model in every municipality, I believe that the most effective way is to seed the areas of the Commonwealth that are underserved with bandwidth reflecting a diversity of focus and experimentation leveraging the passion and drive of visionary project directors.

I could see project launches in specific areas that are driven by local champions:

- Imagine creating ubiquitous wireless clouds in a particular city that allows a local **elderly population to wear wireless health monitor devices** sending data to medical professionals and possibly adult children to keep track of their health and in cases of Alzheimer's, location.
- Imagine having **UMASS Everywhere** added to the state college system providing high bandwidth video distance learning to homes in areas where commuting to Amherst or Boston is not feasible.
- Imagine farmers using **wireless devices on their cattle** to keep track of their medical vitals and even location as they manage their herd.
- Imagine a **statewide network of community technology centers** where corporate executives, teenagers and other volunteers inspire and educate those with low levels of technical acumen and skills as they prepare for new jobs, new ways of connecting to the world and new ways of living their lives in the 21st Century.
- Imagine a county saving thousands of dollars having all **police, fire, and municipal workers using a Voice over IP network** for all of their remote calling needs.

- Imagine **children of incarcerated felons having full video visitations from their homes** to their parents in prison – keeping them away from settings that would scare the most stable individuals.
- Imagine having a wireless **network of natural resources and water supplies** with remote sensors for government rangers, non profits and school kids broadcasting vital information to keep track of wild life, water safety, weather patterns, etc.
- Imagine every performing arts organization in Western Massachusetts **streaming live performances to local arts centers in other parts of the Commonwealth** with local complementary programs going on simultaneously.
- Imagine an entrepreneurial incubator driving new business development giving access to high bandwidth required industries allowing **connections to customers and business partners throughout the world** – also having video walls connected to sister incubators globally letting those involved feel like they are seamlessly working in multiple countries at once.

The dreaming could be endless, the challenge is to find the champions who could drive the applications, the technology vendors (equipment) who are willing to partner with the champions, the internet service providers to become part of the vision and the communities that are ready to be instrumental in crafting and living an exciting and connected future.

Anchor Tenants

When thinking about regionally focused deployments, many providers think of small pilot projects or home revenue driven deployment. They also look at the investment dollars to be considered solely from infrastructure allocations. I recommend that we look to other budgets and sources for development funds.

- Would insurance companies invest in a pilot in one community to see how having all heart patients in one town connected via wireless might lower healthcare costs due to early identification of heart complications?
- Could municipalities use their saved cell phone and land line phone budgets to build a broadband infrastructure as they deploy municipal wide VOIP networks?
- Would utilities be able to use their security and monitoring budgets to build a broadband infrastructure that would save them money and side step major catastrophes by early detection?
- Would UMASS see the value of expanding their student base collecting tuition dollars from remote students without the required construction budgets needed when residential programs expand.
- Would a large Boston or New York corporation looking to build a back office facility in a more rural area, be willing to support the construction of fiber infrastructure allowing seamless activity from their core location to where their new workers are in Western MA and back to their homes. Could we create an

army of high bandwidth corporate telecommuting executives and employees – turning HiddenTech to HiddenPowerTech.

With this Commonwealth wide network of infrastructure projects being supported by budgets beyond the $45 million allocated and those invested by the connectivity service providers, we would experience more rapid deployment of a fiber backbone network with broadband lined and wireless connections to the required and desired locations.

Best Practices around the World

Although the US is significantly behind in broadband adoption, Massachusetts has a distinct advantage to learn from the early adopters around the world due to extensive experiments in deploying broadband infrastructures. We can learn from the success and failures of others in Asia, Europe and elsewhere to help us create our own application deployment effort that in the long term will maximize the impact and lessen the investment necessary for such a bandwidth expansion. We can take advantage of being later in the game by learning from those communities and countries that have experimented and failed. Failure is one of the best lessons as you reach to success, but the biggest failure is not to spend time with those who have failed and succeeded before you.

Multi Vendor Approach

Many communities in building a broadband infrastructure force the bandwidth providers (telephone, cable and others) into a battle where few of the communities win and where the providers limit their ability to financially benefit from broadband everywhere. The United States is so far behind the rest of the world, primarily because we fight, litigate and lobby our way to incremental successes. In order for us to best leverage the funds allocated by the Governor and the brilliance that lies within the borders of our Commonwealth, we must post a challenge to the vendors to behave in a way that can position Massachusetts as the model for others. Let's put away all existing battles and biases and imagine what we could do if we had the resources in innovation and deployment and curtain lobbying and slowing down the process. By challenging the players to change the rules of the game, we can all win and make a difference. This is what American ingenuity is all about. I urge the institute to bring all parties together to collaborate and leverage the collected assets we bring to the table with both proven and breakthrough solutions.

> *By placing intelligence at the edges rather than control in the middle of the network, the Internet has created a platform for innovation.*
>
> *Vinton Cerf, Chief Internet Evangelist for Google and one of the "founding fathers of the Internet"*

By not providing both the technology and sector innovators in every corner of the state access to the internet at high speeds we only become observers in the 21st century. As Vint Cerf suggests, it is responsibility of those at the edges to harness the power of the internet. Our peers in Seoul, Taipei, Stockholm and even St. Cloud, FL are leading the way as some of the most connected cities. It is time for our remote rural and neglected urban centers to have their road into the future so they too can more easily do business with China, Europe, Australia, Silicon Valley and even Boston.
Thank you for the opportunity to share my thoughts.

Stephen

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