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... and Net Neutrality for All: An Advisement Against Regulated Broadband Expansion

Nicholas R Brown

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Nicholas R. Brown, MPA*

*M.P.A., The Florida State University, Askew School of Public Administration. Mr. Brown is a private consultant in high technology industries. He can be reached at nick.r.brown@gmail.com.
Broadband Expansionism

Ever since the now YouTube famous Google interview of then Senator Barack Obama promoting broadband Internet deployment nation wide, broadband deployment as part of Obama’s overarching $825 billion stimulus package has been a ready topic of conversation in technology circles. Broadband penetration in the United States is only 25.67% of all Internet connectivity or available to roughly 71 million Americans, ranking the U.S. 19th in the world. Home connections via broadband have risen to 92.4%, creating the argument that the majority of Internet users are engaged in daily activities that require, or at least benefit from, broadband connectivity. Obama has promoted this line of thinking, and believes “that America should lead the world in broadband penetration and Internet access”. Pushing it even farther, he believes that the Universal Service Fund should be implemented in the expediting of deployment. This line of thinking is more than likely impossible.

Economic Stimulus?

There is no clear winning argument for why America should lead the world in broadband connectivity, first of all. It is reasoned by Free Press and like minded individuals and organizations that broadband stimulus will be a boon to the American economy and job creation. This is probably based on a report created by Brookings and MIT scholars that has been circulating recently which claims that “…for every one percentage point increase in broadband penetration in a state, employment is projected to

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5 Id.
increase by 0.2 to 0.3 percent per year. For the entire U.S. private non-farm economy, this suggests an increase of about 300,000 jobs…”\textsuperscript{6} What is generally not reported is the continuation of this paragraph, “assuming the economy is not already at “full employment” (the national unemployment rate being as low as it can be with a low, stable rate of inflation). At a more disaggregated level, we find that employment in both manufacturing and services industries (especially finance, education and health care) is positively related to broadband penetration.”\textsuperscript{7} The point being that the argument can easily be reversed, countering that prosperity and wealth creation stimulate broadband penetration; i.e. Individuals improving their job placement will either have additional wealth to afford a broadband connection increasing broadband penetration in an area, or an increase in an areas social scale drives corporations to expand services into an area that previously was unable to receive that service. Additionally, the author’s note in a follow-up post on Brookings website that, “While most communications sector analysts concur that the ability to deliver broadband communications is a critical feature of the modern global communications infrastructure, there is limited recent empirical research on the economic effects of broadband. In particular, much of the available research is now several years old or refers to the benefits of the Internet generally or more broadly of the ”digital economy” rather than to the broadband telecommunications infrastructure per se.”\textsuperscript{8} This speaks for itself.


\textsuperscript{7} Id.

Backing Obama’s position and encouraging him to move forward are the 57 member companies and organizations of the Broadband Coalition,\(^9\) many of whom would be involved in building an expanding broadband infrastructure. Not to anyone’s surprise being that federal funding would reduce their overall project costs for expanding their broadband networks, which sounds strangely reminiscent of the $200 Billion provided to the telecommunications industry in tax breaks and relief from price controls to build the US a fiber and hybrid-fiber network by the year 2000 that never happened.\(^10\)

Encouraging the expansion of broadband could be beneficial to the country, and there exists the potential to create new jobs and produce a greater commerce revenue stream through that expansion. But doing so via the spending of federal dollars will only enhance social welfare on the Internet because existing regulations have resulted in too little private investment in broadband. Eliminating government barriers would alleviate any potential benefit from public investment in broadband. Additionally, expansion when subsidized could reduce competition in certain areas. In grand plans like these, the federal government tends to design their strategy around a one size fits all solution for the entire country. This isn’t going to work. Broadband infrastructure will need to be expanded at the state and local level where unique area specific issues can be solved, and the best technology and methods of implementation can be achieved for that specific location. It would be costly, difficult, and unwise to begin running fiber into the Appalachian Mountains, and WiMax becomes vulnerable to low efficiency when it is set too far away from Internet backbones.

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Technology & Implementation at the Local Level

The Broadband Technology Opportunities Program, which is the official title of the broadband stimulus, does call for the maximum use of the infrastructure,\textsuperscript{11} which could suggest lower speed connections. However, Obama is a supporter of fiber optic technology.\textsuperscript{12} This will inevitably be the primary technology that his administration pushes for when details are hammered out in the months following stimulus passage.\textsuperscript{13}

Regulating a specific technology is not appropriate for the future of the Internet. One solution to network infrastructure will be stifling for innovation and the use of many available technologies that exist in the market place to extend and improve broadband availability. Additionally, networks that would be required to be open access would regulate the type of network that could be built, and determine its usefulness. And regulating network design may well hinder that networks ability to truly be innovative and useful in decades to come.

Christopher Yoo, legal professor at The University of Pennsylvania points out that, “Consumer demand for more time-sensitive applications, such as Internet telephony and streaming media, may be providing much of the impetus away from standardization. Forbidding network owners to introduce routers that can assign different priority levels to packets based on the nature of the application would have the effect of precluding consumers from enjoying the benefits of certain types of applications. The current ubiquity of TCP/IP makes it seem like an appropriate default rule and appears to justify

\textsuperscript{13} Supra 11, H.R. 1 dictates that a National Broadband Plan must be presented to the House Committee on Energy and Commerce and the Senate Committee on Commerce, Science and Transportation no later than 1 year after the passage of the bill.
placing the burden on those who would deviate from it. A moment’s reflection makes clear how adherence to the Internet’s nonproprietary structure may actually impede innovation”.  

With Obama already being billed as the ‘Science and Technology President’ and claiming to “restore science to its rightful place,” in his inauguration speech, it would seem impeding innovation with regulations that may become a burden under future network technologies would be counter to his goals of progress in those areas. Additionally, settling for one design as a national broadband standard will prove cost inefficient. The optimal expedition of future network expansion and improvement needs to include many differing technologies based on what is needed at the local level. Preferably, competition between last-mile providers would create the best options for the consumer. Local market competition along with a survey of the needs of that community, extended area, or region should determine what broadband technologies are best. But in any case, an examination of available technologies and what suits each community is the most optimal route with a consideration of many options including cable DOCSIS 3.0 technology, WiMax, Fiber Optic, Hybrid-Fiber, new innovations with Satellite and Satellite-Hybrid networks.

The expansion of broadband Internet use in the United States produced innumerable innovations. Nearing the end of 2007, broadband Internet usage had captured some 78% of the of all Internet connectivity in the nation. And by mid-2008

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was expected to reach 90%.\textsuperscript{18} Leonard Waverman, the dean of the Haskayne School of Business at the University of Calgary and developer of the “Broadband Scorecard” has stated that America leads the world in using broadband technologies in the workplace for economical means. Alluding to the mythology that Korea’s high-speed connections to the home are the end-all-be-all example of what America should strive for, he said, “Korea has great broadband to the house, but businesses in Korea don’t use the best networks and don’t have the skills and computing assets they need to take advantage of them.”\textsuperscript{19} This is where America shines, and we have been doing this through private sector investment in infrastructure.

Additionally, we are probably nearing a saturation point. Evidence of this was shown in the Pew Internet & American Life Project that reports two-thirds of those without broadband don’t want it.\textsuperscript{20} This is most certainly a reality. No matter how much those in the technology community belabor the joys of using broadband, to some, it will always be a useless toy and not a necessity. Many individuals only use Internet at work as a tool for their profession. Some may only check email or use the Internet for very infrequent, light browsing. For these individuals, and countless other examples, the need for broadband is unnecessary, or its additional expense cannot be justified. This is similar to individuals choosing higher octane gasoline. Some buy cars that require a higher octane and they justify the expense, while to others the lowest grade will operate their car just as well, and the added cost of a higher grade is wasteful. The market provides options, and the consumer chooses what works best for them.

\textsuperscript{18} Supra 17, http://www.websiteoptimization.com/bw/0802/.
Certainly, without question, the Internet’s existence has been a remarkable boon to the US and world economies. Being that broadband Internet has allowed a richer more in-depth experience to be had by the end user, it certainly suggests that the extension of broadband networks in the U.S. could increase the opportunities both start-ups and end users may have. Furthermore, the reach of content providers whose offerings to the consumer requires broadband speeds would be greatly extended. Individuals who may not have had access to a fee based streaming media service for instance, would now have those services at their finger tips, and would be paying back into the economy.

Where the trouble lies in all of this is that someone has to build these rural networks. And this will not be cheap. To work effectively, broadband technologies must remain close to an Internet backbone. Based on this, using Verizon FiOS for example, the costs of running fiber all the way to the home can be extreme. Verizon has spent roughly $18-$20 billion doing so.\(^\text{21}\) AT&T has spent considerably less, roughly $6.5 billion using VDSL technology, which is a hybrid-fiber connection using the existing coaxial network in one's home.\(^\text{22}\) Additionally, bear in mind that both companies are upgrading their networks in areas with major Internet backbones. President Obama’s broadband stimulus is intended to build networks in a method that will “maximize use of the supported infrastructure by the public,”\(^\text{23}\) which indicates clearly that the objective is to reach more with less instead of less with more. The FCC has defined broadband to be access to the Internet at speeds of at least 768Kbps,\(^\text{24}\) and therefore the proposed stimulus


\(^{23}\) Supra note 11.

for broadband would require the grantee to build a network that would provide as many
greater than or equal to 768Kbps connections as possible, rather than a smaller higher
bandwidth network. This is honorable in its goal to reach individuals that do not have
broadband connectivity in rural areas that may desire it. However, if by the time the
network is built it lags behind the rest of network technology, and more money has to be
spent to upgrade it, building a more future-proof smaller network and expanding it on an
as needed basis may be a better option, and one that could more readily be handled by the
private sector. In either case, going back to the original examples, the project will be
extremely expensive, because not only will it incur the costs of the area network itself,
but will require the extension of a backbone brought to the area. In a report on broadband
stimulus by Free Press, it is estimated that installing a Fiber-to-the-Home network for the
6-8 million unserved homes across America will cost roughly $2,000-$5,000 per home,
ultimately billing out between $12-$40 billion.\textsuperscript{25} Ultimately, the costs will most likely be
too high for the government to desire to handle on their own, especially considering that
the $7 billion included in the stimulus is actually separated into different areas of
provision related to broadband. The use of the USF and other Congressional aid may be
sought in the future to provide the additional funds required to build out a future proof
network like this. However, the majority of the costs for building these networks will
most likely be incurred by the grantee. Yet it will be this grantee that will be forced to
adhere to a taxing set of regulations.

Gateway Neutrality

Within the American Recovery and Reinvestment Act of 2009 exists Title VI SEC. 6001(j). This describes the non-discrimination and interconnection mandate which must be followed to obtain stimulus funds as a grantee, part of which is the adherence to the FCC Policy Statement on Broadband. This FCC policy statement is a point-by-point description of the commission’s definition of net neutrality. While there are no specific details regarding the rigidity with which these policies would be enforced, traffic shaping is generally considered a violation of net neutrality principle. The result of which is that network operators will not be able to alter packet transfer to best suit the needs of their customer base. An example of this is the recent announcement by Cox Cable to introduce a new traffic management system. Neutrality proponents disagree with this type of active management because it does not treat each and every packet equally. This is the common nature of the Internet. As Richard Bennett, a network architect who has testified before the FCC, describes it, “In its essence, the Internet is a resource contention system that should, in most cases, resolve competing demands for bandwidth in favor of customer perception and experience. When I testified at the FCC’s first hearing on network management practices last February, I spent half my time on this point and all other witnesses agreed with me: applications have diverse needs, and the network should do its best to meet all of them. That’s what we expect from a “multi-purpose network”, after all.” At some point in the neutrality debate, the lines of

26 Supra 11, p. 562.
argument were confused, and neutrality in packet transfer became equivalent to protecting the end user and providing them the best experience. In actuality, an ISP that can manage traffic in real time as they monitor their own network provides the best experience for the consumer. Imagine if fire trucks and ambulances were regulated to obey the same traffic laws that standard commuters are forced to obey? Obviously in those cases we are dealing with emergency situations, but the principle still applies. A network manager can see traffic conditions in real time, and can prioritize those time sensitive packets like an ambulance through street traffic allowing the application to work correctly and seamlessly on the end users side. Innovative techniques and technologies like these will be limited or disallowed under imposed net neutrality regulation that will be enforced in broadband stimulus legislation. Furthermore, networks built with government funding could find themselves at the will of government censorship creating First Amendment violations.

Additionally this implementation could ease the enforcement of neutrality rules on other public or private networks acting as a ‘gateway drug’. This would be similar to the voluntary neutrality regulation passed in Norway recently. At some point, when the voluntary policy has obtained enough big market player signatures, passage of enforced, involuntary regulation will quickly follow.

**The Keynesian Assumption**

At the root of the Obama stimulus, even in regards to broadband, the plan is still Keynesian. The government will still be taking in taxes to pay for what it believes will stimulate the economy. They will be dictating what areas networks should be built in,

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pre-determining that they will be successful promoters of economic stimulus and wealth creation, and ultimately determining the technological and innovation side future of the Internet in part or in whole. When looking at the data, and the growing market saturation of broadband usage, it appears that the majority of those who desire broadband services and have access to them have joined. ISP’s know this and recognize the consumer desire for those services. They will, without a shadow of a doubt, extend their services into rural areas that show a need for broadband access when the market is suitable to expand into those areas.

**Lessons from Previous Rural Expansion Programs**

The project will most likely be modeled after the Department of Agricultures Rural Utilities Service Broadband Grant and Loan Program (RUS). This was a program designed to extend broadband services into rural areas of the country. The program was a one stop shopping solution to the broadband needs of any rural area, and was met with little or at least questionable success. An audit of the program reported that, “During the 4 years the Rural Utilities Service (RUS) has administered Federal loans and grants for extending broadband service to rural America, the programs’ focus has shifted away from those rural communities that would not, without Government assistance, have access to broadband technologies. This change in the programs’ emphasis has occurred for two reasons. First, in its loan program, RUS has not satisfactorily implemented statutory requirements for serving rural instead of suburban areas, nor does it have a system that can guarantee that communities without preexisting service receive priority. Second, RUS’ inconsistent administration of the programs has resulted in irregularities in approving and servicing grants and loans. Of the $895 million in loans and grants
funded, we reviewed $599.1 million (67 percent) and questioned the use of over $340.4 million—almost 57 percent of the approved funds reviewed.”

What occurred with the RUS rural broadband program was that there were no clear cut well defined statements of what a rural community was, what the requirements were for installation of services, and consistent adhering to the grant and loan requirements they had defined. This resulted in the program having, “…issued over $103.4 million in loans to 64 communities near large cities, including $45.6 million in loans to 19 planned subdivisions near Houston, Texas.”

RUS was also funding competing service providers without adhering to program policy that stated that underserved or areas with no service were priority to receive funding. The audit also addresses the fact that the Office of the Inspector General is concerned about the ethicality of supporting competing service providers, stating, “Furthermore, we question whether the Government should be providing loans to competing rural providers when many small communities might be hard pressed to support even a single company. In these circumstances, RUS may be setting its own loans up to fail by encouraging competitive service; it may also be creating an uneven playing field for preexisting providers operating without Government assistance.”

If the Obama administration’s desire is to extend broadband into rural areas, and this is their model, we have a problem. The taxpayer would be just as easily served to throw their wallet out the window as they are driving down the street. At least they would know where their money went in that case. This model needs serious work and

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32 Id.
accountability. And the ethicality argument is a very good one. Should the government reimburse service providers that go out of business in low volume user areas because the government chose to subsidize a competitor to come into their area and offer service? There is no scenario in which this should occur.

**Recommendations Moving Forward**

Broadband should be instituted in communities without a strings attached approach. The appropriate move would be to deregulate broadband industries making it easier and more cost efficient for them to expand into rural areas. If the only way the administration will promote broadband expansion is through public funding, operated via a set of rules and regulations determining how that network can be built and how it can be managed, then that is simply not in the best interest of the consumer, and that promotion should be discontinued.

Competition and community need should be the driving force behind expansion of services; giving the free markets a chance to appropriately solve any problem areas and the needs of rural communities. Ultimately, with passage of the American Recovery and Reinvestment Act, public funding is unfortunately assured. But there is still an opportunity to recommend a change in burdensome regulation and neutrality requirements during the creation of the National Broadband plan and implementation. With great emphasis it is recommended that there be reconsideration on forcing the implementation of FCC net neutrality requirements so that the impeding of technology and innovation that may interfere with wealth creation is avoided. Strict refinement of policies used in RUS with defined terminology of what is considered a rural area and plainly distinguish what is an unserved or underserved area. Additionally, ethics policies
need to be both put in place and enforced in regards to awarding grants to companies that
would use funds to move into areas already served by a service provider, or subsidizing
one company over another in underserved areas where two providers may exist and one is
seeking to expand services. It cannot be stressed enough that government should not be
picking winners and losers; maybe even more so when it comes to technological
solutions and innovation.