
Traffic on the Information Super Highway -- Use vs. Useful?

Kenneth A. Grant
kagrants@ryerson.ca

Catherine Middleton
catherine.middleton@ryerson.ca

Ted Rogers School of Management
Ryerson University, Toronto, ON, Canada

Abstract

The information superhighway has been a focus of government strategies across the world for almost 20 years. Today often seen as synonymous with widespread broadband availability to users, it continues to attract widespread interest and a largely uncritical belief that increasing broadband penetration will have significant benefits to society and national economies.

This short working paper briefly reviews the concept of the Superhighway and addresses specific current issues that seem often to be forgotten in the largely pro-technology discourse. It examines projected and actual use of the Internet, the credibility of Internet revenue models and the policy-related capacity challenges being faced by regulators and operators. It provides some direction for future research to better address the gap between rhetoric and reality.

Keywords: Business models, dot.com, Internet

1. INTRODUCTION – CAPACITY VS CONTENT

The *Information Superhighway* has been a subject of major interest since Bill Clinton and Al Gore described a National Information Infrastructure (NII) as a key part of their call to use technology for US economic growth (Clinton & Gore, 1993). A recent Google search provided over 1.5 million references to the term.

Table 1 in the Appendix provides some fairly typical references to the concept. From these and other such references some generalizations can be drawn:

- Initial reference to the concept emerged around the same time that the Internet was first being considered as a major communication tool, in the early to mid

1990s. From the United States to Europe to Asia, the Internet superhighway was seen as a new economic engine helping to drive improved economic performance.

- Recent years have seen a repeat of the calls for national action often claiming lagging performance by the country/region in question, along with references to the success of South Korea.
- From the beginning, some observers were suggesting that simply providing the data highways was not enough and that consideration was needed of the services and products that might be carried by the superhighway.

Implicit from the earliest days was a belief that this was a high-speed network, with the UK House of Lords suggesting “we have defined the

information superhighway as a publicly accessible network capable of transferring large amounts of information at high speed between users. This broad definition transcends the physical nature of the technology employed."

Today, fixed and mobile broadband networks are seen by most as the expected solution and, of the world's 2.3 billion Internet users in December 2011, according to Internet World Stats, (<http://www.internetworldstats.com/stats.htm>), the ITU estimates that some 30% have broadband access, with penetration rates at about 46% in Europe and 24% in the Americas (ITU, 2011) with operators continuing to make major investments -- "Mobile broadband is set to account for 52% of all operator investment in mobile infrastructure globally" (Global Telecoms Business, 2010).

Current debate tends to focus on two issues -- the broadband capacity and bandwidth needed to meet societal needs and the need for very high levels of access to these networks by most of any given society, including both rural communities and underprivileged groups. The term "digital divide" is widely used both nationally and internationally to describe such disparities between countries and within societal groups. In its most recent annual report, the International Telecommunication Union reports that, "Perhaps the most dominant policy and regulatory issue at present concerns the promotion of broadband access. At least 70 governments have adopted a national policy, strategy or plan to promote broadband" (ITU, 2011). It also claims that, "the evidence is fairly conclusive about the positive contribution of broadband to GDP growth".

At the same time, as capacity is growing, so is demand. Cisco projects a CAGR for IP traffic of 34% from 2010-2015, with a 95% growth in mobile traffic (CISCO, 2011).

Yet there may be a paradox emerging. Despite the rhetoric on the transformational power of the Internet and, more specifically, broadband the actual impact is often more limited. As Middleton (2010) reported, in Canada (a country with relatively high standings in most Internet measures), "the pace of technological innovation and infrastructure development is ahead of our capacity to effectively make use of, and engage with these digital technologies." She comments further that, while Canadian Internet adoption

rates are high, only about 30% of adult Canadians could be described as "high-intensity" users.

2. USES OF THE INTERNET

The projections and descriptions of Internet use can be considered in five broad categories:

- As a communications tool
- Providing near universal access to needed information
- As a source of entertainment
- Providing access to government services (ranging from e-government to education}
- Providing economic opportunities through the growth of high-tech (especially communications) businesses as well as doing business on the Internet (usually described as "e-business" or "e-commerce")

In one of the most comprehensive longitudinal studies of Internet use, the work of the Pew Research Center provides a 10-year picture of US user online activities. Their analysis shows that, over the decade from 2000 to 2009, there has been significant growth in each of the 26 activities that they analyze. However, in only of 6 these activities do more than 50% of the US population report use (e-mail, using search engines, researching products or services, checking the weather, buying a product and getting news) (PEW, 2011). While some usage is common across all generations, they also report that that younger users are more likely to use instant messages, social networking and download music and videos (PEW, 2009).

Other US data indicate that, while the adoption of e-commerce is significant, it still reflects only a small proportion of economic activity. Business-to-business (B2B) activity constitutes 91% of all e-commerce, with e-commerce representing about 32% of the total market, mainly using proprietary EDI services. In the business-to-consumer (B2C) market little more than 3% of sales are done over the Internet, and about 70% of these sales are from "non-store" retailers ("U.S. Census Bureau," 2011). Examination of B2C activity shows a strong concentration of sale in just five areas -- books, clothing, electronic equipment, airline travel and hotel reservations. However, the Internet is also used as a major research source to inform buying decisions (Nielson, 2010).

These data suggest that, while the Internet has obviously become part of the daily lives of many people, for most this impact has been incremental rather than transformational. A significant proportion of the population in most developed countries is using the Internet to some degree and inter-business trading has clearly been significantly impacted, producing supply-chain improvements. However, it has had only limited impact on actually selling to the consumer except in a few cases. This is a challenging finding, given that B2C was such a major part of the hype around the original dot.com "boom and bust" at the beginning of this century – a hype that is appearing again around a number of new Internet businesses, particularly the so-called "social media".

3. NEW BUSINESSES AND NEW BUSINESS MODELS

The term "business model" has exploded into widespread use in parallel with the growth of the Internet and, while it is now used in a wide variety of contexts, Internet-related business models still represent much of the discussion (Zott, Amit, & Massa, 2010). Many diverse attempts have been made to define the term, with elements of revenue sources, customer value proposition and available resources and capabilities being frequently mentioned (O'Reilly, 2005; Rappa, 2010).

What have we learned about business models and their use of the Internet? An MIT study of large US corporations (Malone et al., 2006) suggests that some business models are more successful than others and that business models that provide the use of but not the transfer of assets (i.e. "Landlords") outperform others. This might help explain the success of such Internet giants as eBay.

Very limited evidence exists to suggest that new Internet business models play a significant part in economic terms. The data reported above indicates that most commercial activity on the Internet consists of extensions of existing business models (most B2C retailers are basically on-line catalogue sales – little more than the extension of the catalogue model that has been around for some 150 years). Of course, there are success stories, but does the growth of such companies as Amazon, eBay, Google, Facebook and Craigslist provide real examples of the future or are these exceptions?

An argument could also be made that the Internet is just as likely to destroy economic value as to create it. Consider the following:

- The newspaper industry, at least in North America and Europe, has seen significant reductions in circulation and losses in revenue, particularly for classified advertising. In the United States, newspaper classified advertising revenues have fallen over the last decade from about \$20 billion to \$6 billion. The online "replacement revenues" (of which Craigslist is an example) make up, at best, only a few hundreds of millions. While it is true that online readership has grown, in most cases, this has not translated into increased subscription or sales revenue.
- Revenues in the traditional music industry are shrinking, perhaps impacted by the downloading of music, with revenues from online music sales making up an increasing proportion of the industry's revenue. The US industry association (the RIAA) reported that total US sales in 2011 (some \$7 billion) were less than half of sales in 1999, with digital sales now making up about 50% of all sales revenue (Friedlander, 2012).
- Film and cinema revenues have also been impacted as downloading of video increases – we have seen the recent failure of physical video rental companies such as Blockbuster (with revenues of over \$4 billion) and the emergence of virtual lenders such as Netflix (annual sales of about \$2.2 billion). Indeed even Netflix's new model has faced some recent challenges.
- Across the world, wired long distance revenue for Telcos have dropped dramatically. For example, in Canada alone, annual long distance revenues were \$8.7 billion in 1999 and fell to \$3.4 billion in 2010, a 61% decline. During the same period, wireless long-distance rose from \$0.41 billion to \$1.28 billion. (Data taken from Industry Canada websites) In comparison, Skype's *worldwide* revenue for all services was only \$860 million in 2010 (Dotson, 2011).

In addition, the word of education seen new models of access and delivery with the growth of online education and, even more recently the increasing online availability of free courses and other material, from such institutions as MIT. Many governments (for example the Ontario government in Canada) are pressing universities to increase their online offerings. While online education can be seen as providing many useful benefits, it has also seen many criticisms -- both from a pedagogy perspective and on government intent, with cost cutting often seen as a prime motive rather than educational quality (Feenberg, 2008).

What is notable from all these examples is that the disruptive economic activity is most likely to occur when the product is information (or a token that can be exchanged for a product). The old business models are under attack, however the revenue potential for the replacements is less than clear.

In this regard, the valuation of social media businesses such as Facebook, LinkedIn and Craigslist continues to astound. Consider the recent lesson from Facebook.

Prior to its IPO, unofficial reporting of Facebook's revenues and operating income in 2011 suggested annual revenues of around \$3 billion per year, with about a 30% profit margin (Oreskovic, 2011). Yet valuations as high as \$100 billion were suggested. This suggested a stock value to sales ratio of about 35X sales. To put this in context, Wal-Mart with almost 150X the sales, was valued at less than \$200 billion and Apple, likely the most visible high-tech stock in 2011, valued about 20X sales, was valued at about \$250 billion at the end of 2011. Thus, Facebook valuations indicated a 6X higher valuation than Apple! Successful high-tech stocks (e.g., IBM, Microsoft, Apple, Google) typically have market values in the range of 4-5 times their annual sales. Applying this ratio to a \$100 billion valuation, Facebook might be expected to need sales of \$20-25 billion (equal to about 35% of the global market). At its first public offering, in May 2012, Facebook's IPO stock price was \$38, peaked at \$45, then, by the beginning of August it had fallen to below \$20, a 50% reduction in price. On August 3rd, the market value was \$45 billion, still an 11X multiple of sales, suggesting it is still overvalued.

As another example, Craigslist, with sales of about 100 million in 2010 has been valued at over \$5 billion or over 50X sales! Netflix, has a market capitalisation of about \$14 billion, with sales of 2.2 billion, a "mere" 6X sales. These exuberant valuations bring back disturbing remembrances of the dot.com boom and bust. Michael Porter commented then that, "many businesses active on the Internet are artificial businesses competing by artificial means and propped up by capital that until recently had been readily available" (Porter, 2001). It may be that we are seeing some similar behaviour in the current Web 2.0 market hype.

As the Facebook discussion above suggests, the other area in which we are seeing significant transfer of economic activity from traditional models to the Internet is in advertising. The global media ad spend was estimated to be almost \$500 billion in 2010 (DigitalTonto, 2010), with 2010 online advertising being estimated at about \$68 billion globally (eMarketer, 2011) and 26 billion in the US (PwC, 2011). Online advertising is projected to grow at a significantly faster rate than traditional advertising, with projections for 2015 to be about \$100-130 billion (eMarketer, 2011; Marketing Charts, 2010). In the US, "In 2010, (US) Internet Advertising surpassed advertising revenues in Newspapers" and is now the second largest category, after television (PwC, 2011).

As a result, advertising revenues are seen as the primary source of income and income growth for many Web 2.0 business models. This raises a number of concerns. The most obvious is whether there will be sufficient revenue to fund all the businesses that expect to draw from it, and the answer to this question is likely to be "no". In addition many of these models depend on the monetization of social media sites. It is not clear that the users of such sites will respond well to these attempts to monetize the businesses. Further, while most forecasters predict growth in the global advertising market, particularly in developing countries, there are more critical perspectives, such as Clemons (2011), who argues that "Online advertising cannot deliver all that is asked of it. It is going to be smaller, not larger, than it is today. It cannot support all the applications and all the content we want on the Internet" (Clemons, 2011) and suggests that "the problem is not the medium, the problem is the message, and the fact that it is not trusted, not wanted, and not

needed”, and that alternate approaches to monetization must be considered.

4. INTERNET TRAFFIC

In examining 2009-2010 changes, Cisco reported a growth in global IP traffic of 40% in 2010, to a rate of more than 20 exabytes per month, with global mobile traffic growing by 159%. Internet video traffic, growing by 85%, made up 40% of all consumer Internet traffic in 2010. They project a four-fold growth in all IP traffic by 2015 (26-fold for mobile) and that video will have increased to 61% of the traffic. The number of network devices is expected to double to 15 billion devices. Global capacity is expected to grow to match this demand (2011).

Others are less sanguine that the capacity will be there to meet the demand, pointing to existing effects of network congestion and conflicts between classes of users -- the need for high-speed mobile phone access (Rysavy, 2010) and time-specific pressures from P2P users and video downloads being two examples (Waters, 2008). The Internet Society also suggests that, while “at the macro level, the data suggests that supply is keeping pace with demand.” there may be micro-level issues (The Internet Society, 2010). One 2010 report suggested that “Netflix accounts for approximately 20% of downstream traffic in North America” (Sandvine, 2010).

P2P traffic is particularly problematic. Sometimes seen as the debate around “network neutrality” (the belief that the Internet is free and open and that broadband network providers’ service levels should be detached from the specific data being sent across their network). Yet, as can be seen from the previous discussions, more than half the use appears to be activities that, while they might provide personal satisfaction to the user, may provide very limited benefit to society or add to economic activity on the Net. This is not just a social issue, there are also concerns that the use of some of these applications are having negative effects in the workplace, affecting performance of both networks and individuals (Exinda, 2010).

It is beyond the scope of this paper to discuss the many political and social arguments made around Net Neutrality (some of the key activist arguments can be found on the website <http://www.savetheinternet.com>) but, as Van Schewick (2012) commented, following the FCC

2011 ruling on non-discrimination, “Over the past ten years, the debate over ‘network neutrality’ has remained one of the central debates in Internet policy” and that “non-discrimination rules affect how the core of the network can evolve, how network providers can manage their networks, and whether they can offer Quality of Service”

Thus, while some argue that the positive network effects of Net Neutrality will outweigh the revenue impact on current service providers (e.g. Hogendorn, 2010), others claim that service offerings need to be linked to traffic types. (e.g. “Bandwidth costs money. Equipment costs money. More bandwidth costs more. Differentiated services also cost more”(Hultquist, 2010).

5. SOME CONCLUSIONS AND FURTHER WORK

From a pure numbers perspective, it seems pretty clear that the growth of the Internet in terms of users, broadband penetration and traffic will continue for the foreseeable future. Further, only a Luddite would suggest that the Internet and the World Wide Web have not had a dramatic impact on how many people live and how organisations across the world operate.

In evolving markets the number of users will continue to grow, in more mature markets bandwidth demands will increase. However, this brief examination of the rhetoric around broadband over almost 20 years and current online behaviors -- both individual and corporate -- indicate that we are a long way from achieving many of the benefits projected. These two quotations provide a useful direction for future research:

- “The interests of ISPs, users, and content providers are not always well aligned” (The Internet Society, 2010).
- “There is a big gap between the rhetoric of the benefits of broadband connectivity, and the availability of applications that would actually enable ordinary citizens to fully engage in the digital society in ways that have a meaningful impact.” (Catherine A. Middleton, 2011).

It is notable that much of the rhetoric supporting Net Neutrality comes from those with most to

gain, both the individuals and groups involved in the "new media" and the mega-businesses such as Google, Facebook, Amazon and eBay -- the content providers and aggregators. And, of course, the general users of the Internet who have been brought up in the belief that the Internet is free! In essence this lobby is attempting to pre-determine which business models will succeed, possibly to the detriment of some existing players (such as content creators, telcos and ISPs) and may not be to the best interests of some of the various classes of Internet user.

Policy makers should be cautious not to be caught up in the rhetoric and should adopt a more skeptical approach in considering how to develop policies and regulation on Internet activities.

This is a preliminary review and follow up studies could add to the debate, including more detailed examination of Internet traffic demands and usage relating costs of service provision and expansion to the various user activities and payments. In addition, as many of the Web 2.0 business models depend on significant increases in on-line advertising, research on likely growth and advertisers intent and expectations could prove very valuable.

To conclude, if the Internet Highway is to live up to its 20 year old promise and also support viable business models, we may need to consider further whether we need to follow more of a physical highway model where the tariffs and facilities offered may depend on the types of use, the user and the freight being carried?

6. REFERENCES

- Auckerman, W. (1994). Building On-Ramps to the Information Superhighway. *Computing Japan*.
- CISCO. (2011). Cisco Visual Networking Index: Forecast and Methodology, 2010–2015.
- Clemons, Eric. (2011). Why Advertising Is Failing On The Internet. Retrieved 22nd August 2011, 2011, from <http://techcrunch.com/2009/03/22/why-advertising-is-failing-on-the-internet/>
- Clinton, William J., & Gore, Jr., Albert (1993). Technology for America's Economic Growth, a New Direction to Build Economic Strength, . Washington, DC.
- DigitalTonto. (2010, 15th December 2010). The Future of the Advertising Business Model. Retrieved 24th August 2011, 2011, from <http://www.digitaltonto.com/2010/the-future-of-the-advertising-business-model/>
- Dotson, K. (2011). Skype Revenue Up 20% in 2010; Now Looking to Advertising on Road to Next Year's IPO. *Silicon Angle, March 7th, 2011*. <http://siliconangle.com/blog/2011/03/07/skype-revenue-up-20-in-2010-now-looking-to-advertising-on-road-to-next-years-ipo/>
- eMarketer. (2011). Worldwide Ad Spending: Online Drives Growth: eMarketer.
- Exinda. (2010). Controlling Peer-to-Peer and Recreational Internet Traffic: Reclaim Bandwidth for Business-Critical Applications: Exinda.
- Feenberg, Andrew. (2008). *The Online Education Controversy*. Paper presented at the Conference on Technology for Learning, Teaching and the Institution, JISC-CETIS, Birmingham, UK.
- Force, ICT Policy Task. (2010). Toward Realization of the "New Broadband Super Highway (Hikari no Michi)" Plan Final Report (Draft): The ICT Policy Task Force for a Global Era.
- Friedlander, J.P. (2012). 2011 Year-End Shipment Statistics & News and Notes on 2011 RIAA Music Shipment Data: Recording Industry Association of America (RIAA).
- Global Telecoms Business. (2010, 10th February 2010). Broadband investment 'to hit \$72bn in 2010". *Global Telecoms Business*.
- Hoffman, Donna L. , & Novak, Thomas P. (1994). Commercializing the Information Superhighway: Are We in for a Smooth Ride? *The Owen Manager, 15(2), 2-7*.
- Hogendorn, C. (2010). Spillovers and Network Neutrality, filed with the FCC on behalf of Google.

- Hoy, Greg. (2007, 21st February 2007). Aust left behind on Internet superhighway. *The 7.30 Report*. Retrieved 31st August 2011, 2011, from <http://www.abc.net.au/7.30/content/2007/s1853607.htm>
- Hultquist, S. (2010, August 7th, 2010). Why "Net Neutrality" is Wrong. Retrieved July 15th, 2012, 2012, from <http://stephenhultquist.com/thoughts/2010/08/07/why-net-neutrality-is-wrong/>
- ITU. (2008, 10th December 2008). Obama Promises to "Renew Information Superhighway". Retrieved 31st August 2011, 2011, from <http://www.itu.int/ITU-D/ict/newslog/Obama+Promises+To+Renew+Information+Superhighway.aspx>
- ITU. (2011). Trends in Telecommunication Reform 2010-11: Enabling Tomorrow's Digital World: International Telecommunication Union.
- Kim, Yongsoo , Kelly, Tim , & Raja, Siddhartha (2010). Building broadband: Strategies and policies for the developing world: World Bank.
- Lovelock, Peter (1997). *The Asian NII Experience*. Paper presented at the inet97: The Seventh Annual Conference of the Internet Society, Kuala Lumpur, Malaysia.
- Malone, Thomas W. , Weill, Peter , Lai, Richard K. , D'Urso, Victoria T., Herman, George , Apel, Thomas G. , & Woerner, Stephanie L. (2006). Do Some Business Models Perform Better than Others? *MIT Working Paper* (Vol. 4615-06).
- Marketing Charts. (2010). Online Ad Revenues to Reach \$103B by 2015. 20th August 2011, 2011, from <http://www.marketingcharts.com/direct/online-ad-revenues-to-reach-103b-by-2015-13163/>
- Middleton, Catherine A. (2011). From Canada 2.0 to a Digital Nation: : The Challenges of Creating a Digital Society in Canada. In M. Moll & L. R. Shade (Eds.), *The Internet Tree* (pp. 3-16). Ottawa: Canadian Centre for Policy Alternatives.
- Middleton, Catherine A. . (2010). Preparing Canada and Canadians for the Digital Society: Research on Digital Infrastructure and Digital Literacy: Submission to Canada's Digital Economy Strategy Consultation: Ryerson University.
- Nielson. (2010). Global Online Shopping Report. Retrieved 22nd August 2011, 2011, from <http://blog.nielson.com/nielsenwire/consumer/global-online-shopping-report/IfThe>
- O'Reilly, T. (2005). What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software. Retrieved July 1st, 2009, 2009, from <http://oreilly.com/web2/archive/what-is-web-20.html>
- Oreskovic, Alexei. (2011). Exclusive: Facebook doubles first-half revenueThe (Vol. 2011): Reuters.
- PEW. (2009). Generational differences in online activities *PEW Internet & American Life Project*. Retrieved 22nd August 2011, 2011, from <http://www.pewinternet.org/Infographics/Generational-differences-in-online-activities.aspx>
- PEW. (2011, 28th January 2009). Online activities 2000-2009. *PEW Internet & American Life Project*. Retrieved 22nd August 2011, 2011, from <http://pewinternet.org/Static-Pages/Trend-Data/Online-Activities-20002009.aspx>
- Porter, Michael. (2001). Strategy and the Internet. *Harvard Business Review*(March 2001), 62-78.
- PwC. (2011). IAB Internet Advertising Revenue Report: Interactive Advertising Bureau (IAB).
- Rappa, Michael. (2010, 2010). Business Models on the Web. *Managing the Digital Enterprise*. Retrieved July 12th, 2012, 2012, from <http://digitalenterprise.org/models/models.html>
- Rysavy. (2010). Mobile Broadband Capacity Constraints And the Need for Optimization: Rysavy Research, LLC.

Sandvine. (2010). Fall 2010 Global Internet Phenomena Report: Sandvine Inc.

Select Committee on Science and Technology. (1996). Information Society: Agenda for Action in the UK. London: House of Lords.

The Internet Society. (2010). Growing Pains: Bandwidth on the Internet: Briefing Paper. Geneva: The Internet Society.

. US Census Bureau: E-Stats, 2009 (2011): U.S. Census Bureau.

van Schewick, B. (2012). Network Neutrality and Quality of Service: What a Non-

Discrimination Rule Should Look Like: The Centre for Internet and Society.

Waters, Peter. (2008, 5th August 2008). Bandwidth Begets Congestion – A Review of the Impact of P2P Traffic on Broadband Networks. Retrieved 22nd August 2011, 2011

Windhausen Jr, John. (2008). A Blueprint for Big Broadband: EDUCAUSE.

Zott, Christoph, Amit, Raphael, & Massa, Lorenzo. (2010). The Business Model: Theoretical roots, recent developments, and future research *Working Paper*. Barcelona: IESE Business School, University of Navarra.

APPENDIX

IN THE BEGINNING

1993: Just as the interstate highway system marked a historical turning point in our commerce, today "information superhighway" - able to move ideas, data, and images around the country and around the world - are critical to American competitiveness and economic strength. (Clinton & Gore, 1993)

1994: There will be pitfalls to developing interactive multimedia products and services on the Information Superhighway. A large mass market, deep pockets, and previous mass-media experience alone will not guarantee success. Understanding what customers want, are willing to pay for, and what satisfies them remain deeply misunderstood or understood too little by many marketers.(Hoffman & Novak, 1994)

1994: Internet connectivity is one area in which Japan could possibly leapfrog the older technologies and introduce high-tech service from the start. (Auckerman, 1994)

1996: Although the information superhighway is only one component in the move to an information society, it is as important to the movement of information as dual carriageways and motorways are to the movement of cars. The information superhighway thus has a central role to play in the new information revolution (Select Committee on Science and Technology, 1996)

1997: There is a second issue concerning development of the Internet from a national policy perspective: where government intervention is recommended, policy choices are usually portrayed as focusing on *either* production *or* use, without seeing the issues as interrelated. (Lovelock, 1997)

MORE RECENTLY

2007: A war of words erupted today over the speed of broadband Internet services in Australia. The consensus amongst those in the industry is that, despite government assurances, Australia is very much in the slow lane of the Internet superhighway.(Hoy, 2007)

2008: President-elect Barack Obama pledged to expand Americans' access to broadband Internet (ITU, 2008)

2008: The United States is facing a crisis in broadband connectivity. The demand for bandwidth is accelerating well beyond the capacity of our current broadband networks, especially as video traffic and home-based businesses become more prevalent. (Windhausen Jr, 2008)

2010: Countries around the world are looking to spur the growth of broadband access and use as the next stage in the development of telecommunications networks and services.(Kim, Kelly, & Raja, 2010)

2010: The "New Broadband Super Highway (Hikari no Michi)" Plan (with the goal of making broadband available to all households by around 2015) aims at further economic development in Japan through accelerating the development and use of a broadband infrastructure and realizing an affluent society in which the benefits of ICT can be rapidly, fairly, and sufficiently felt/enjoyed through optimal use of ICT while still protecting the communication rights of everyone. (Force, 2010)

Table 1: Selected Quotations on the "Information Superhighway"