Testimony of Laurence F. Johnson, Ph.D.

Chief Executive Officer
The New Media Consortium

COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON TELECOMMUNICATIONS AND THE INTERNET
U.S. HOUSE OF REPRESENTATIVES

April 1, 2008

"Online Virtual Worlds: Applications and Avatars in a User-Generated Medium"

Good morning Chairman Markey, Vice Chair Doyle, Ranking Member Stearns and Members of the Subcommittee. Thank you for allowing me this time with you.

My name is Dr. Larry Johnson and I have an avatar.

I also have the privilege of leading the New Media Consortium, a 501(c)3 not-for-profit association of more than 250 world-class colleges, universities, and museums focusing on emerging technologies. Among the many exploratory projects we do, for more than two years we have led the largest educational project of its kind in any virtual world, one that involves hundreds of institutions and over 7,500 educators and students working and learning in the virtual world of Second Life®. This project is self-sustaining, and recovers all its costs via operations and activities conducted within that virtual space.

My comments to you here are the reflection of the voices of both this community as well as those of the larger NMC membership, whom I polled as to what they would want to have you consider as I prepared this statement. They see the work they do in Second Life as merely another facet of the work they are doing on their campuses — and that is the first point I hope to leave with you this morning about the nature of virtual worlds. Any dichotomy drawn between activities in the real world and that of the virtual world is artificial at best. Behind every avatar is a living thinking person, and in the case of my community, we see little reason to distinguish one's virtual identity from any other aspect of their identity. I am the same person, whether you encounter me here in this room, or on the NMC's campus in Second Life.

My second point speaks to the notions of reality and unreality. Whatever happens in a virtual space, the space itself simply extends our notions of the real world, just as the web extends our notions of the network. A virtual world like Second Life or Project Wonderland is not a game, serious or otherwise, and referring to the work done in these spaces as games limits both the potential for the technology and the work it is enabling. After two years of focused research and demonstration projects, we see these spaces as nothing less than the evolution of the Internet from the flat two-dimensional web in which it now resides into three dimensions, with all the richness and depth that implies.

My third and most important point about the nature of virtual worlds is this: The emerging landscape of virtual worlds represents as profound an opportunity, as profound a driver of changes in the ways we think, learn, and work, as any technology that has ever preceded it — and more so.

Virtual worlds are already bridging borders across the globe to bring people of many cultures and languages together in ways very nearly as rich as face-to-face interactions; they are already allowing the visualization of ideas and concepts in three dimensions that is leading to new

insights and deeper learning; and they are already allowing people to work, learn, conduct business, shop, and interact in ways that promise to redefine how we think about these activities — and even what we regard as possible.

Just as the world wide web has unfolded over the last 15 years to erase boundaries between us and become part of the very fabric of our lives, over the next 15 years, virtual worlds will rapidly evolve into a rich three-dimensional extension of ourselves that will have profound impacts on the ways we interact, communicate, learn, work, shop, and conduct business.

Policy Issues for Consideration

These developments are not limited to American interests by any means — the excitement being generated by these new technologies is global. Just as we see the new frontier of virtual worlds and its opportunities begin to unfold, however, the United States is poorly positioned to take advantage of them. We have largely ceded our leadership in the Internet arena over the past dozen years; we are now 19th in the world in providing broadband access to our citizens, and that number has been worsening every year. More than that, the product we allow companies to deliver to our citizens is just one tenth the speed of the broadband commonly available in Japan — we lag at 14th in the world in the quality of our basic Internet service. Twenty other countries provide their citizens broadband Internet access at lower cost than what Americans pay for a generally shoddier product.

I am reminded of similar times and similar opportunities our nation has faced in the past, and of the bold leadership and vision that kept our nation on the track to greatness then. When the country was expanding westward, the *Morrill Act* set aside lands for universities, ensuring that education would flourish as the country expanded; when it was clear commercial interests would only provide electricity to the cities, where profits were easy, the *Rural Electrification Act* brought the modern age to all Americans. When television was new, the FCC ensured that channels would be set aside for education and learning; in 1991, when the world wide web was still just an idea, the *High Performance Computing and Communication Act* ensured that the United States would have the infrastructure in place that ultimately allowed it to lead the world in information technology throughout that decade; the *Next Generation Internet Research Act of 1998* ensured that our computer scientists would be able to develop the next generation of network technologies.

Yet despite the innovation of visionaries like Phillip Rosedale and his team, who created the virtual world of Second Life, the U.S.'s leadership in the emerging landscape of the 3D web is not at all certain. More than 70 virtual world platforms exist at this moment, according to an ongoing study by the American Federation of Scientists, and only a handful are being developed by American companies. While Second Life is by far the most successful today, we need not think back beyond America Online to remember how quickly things can change in this space.

At the same time, we are not addressing important social aspects of the issue either. When Americans came home to a new reality after World War II, the *GI Bill* ensured that the opportunities they needed were within their reach; *Pell Grants* extended the promise of an education to the disadvantaged in 1965, just as computers were emerging onto the scene. More than 40 years later, we've not extended the promise of technology to far too many Americans, and we've really not even begun to think about the geographic and global dimensions of the digital divide.

Where is that kind of vision today? Who will step up to ensure that we not only allow but encourage these new developments to prosper, and entrepreneurs and visionary thinkers to innovate? How will we address the twin challenges of a lagging infrastructure and a growing divide?

Congress can reverse our current technological decline and recapture the excitement and American spirit of innovation by putting policies into place that will encourage development of the 3D web and the virtual worlds that are its precursor. We need leaders today like Frieda Hennock, who as the Commissioner of the FCC in the late 1940s "became impatient for the day when television would become an electronic blackboard, a 'classroom of the air,' serving American students as the proscenium from which culture was to enter the living room of every home." There was strong bipartisan support for the *High Performance Computing and Communication Act*, sponsored by a Democratic senator, and promoted by a Republican president who predicted it would help "unlock the secrets of DNA," open up foreign markets to free trade, and encourage cooperation between government, academia, and industry. It did that, and more.

A hugely important result of this legislation was the development of Mosaic in 1993, the world wide web browser that launched the Internet as we know it — and changed the world in the process.

This kind of leadership is at the heart of what has made America the country it is, and is much needed today.

I encourage this subcommittee to take the first steps in embracing this new technology, so that each of you can begin to see the enormous potential not only promised by the evolution of the network into three dimensions, but already being realized today in communities across Second Life and dozens of other virtual world platforms, such as HiPiHi, There, and Project Wonderland.

The Nature and Growth of Virtual Worlds

Mitch Kapor, the current chairman of the board of Linden Lab, said of Second Life just this past week that it "touches something deep in people." My own experience, gleaned through the NMC's research and work in that particular virtual world, echoes that observation, and the idea is part and parcel of why this new technology is so compelling.

A snapshot of the experience across just one aspect of virtual worlds illuminates this well. There are many ways one might engage in real-time interaction at a distance, such as via a webinar, instant messaging, or even high-definition video conferencing, but in each of these, one never lets go of the essential reality that you are not together. Even with the best of these, a piece of glass separates the participants. One can do a very simple test to discern this — if you move close to the screen in a video conference, no one on the other end steps out of your way. They know that you are not really there.

In a virtual world, on the other hand, the participants each make a choice to move through that glass and meet in the middle, and in so doing, extend their physical presences into the virtual space. If you conduct the same test of moving your avatar closer to another person's avatar, he or she will move away, just as he or she would in the real world. Not only has that person extended his or her physical presence into the world via an avatar, but a sense of personal space as well. The two of you both know intuitively that you are somehow actually together. You have met in the middle.

It is this simple yet profound sense of being in the same place at the same time, seeing and doing the same things, that is at the center of what is new about this technology. No other technology has this compelling characteristic. The applications for it and for bridging time, culture, and distance are endless.

Nowhere among virtual worlds can one see this aspect so clearly as in Second Life. At the NMC, we see Second Life as the most currently evolved of the virtual world platforms today, and wherever this technology takes us, Second Life will be seen as the seminal first instance of what the 3D web might look like. The reasons for that are clear.

Second Life sits at the intersection of three deeply significant trends, and it is here that one should start in order to understand why this technology offers such profound potential. The first trend is an increasing focus on people as the organizing principle of the network, which has been fueled by hundreds of social networking applications, the anytime, anywhere access of wireless networks, and the clear desire of people to connect seamlessly in real time via these networks. At its core, a platform like Second Life is a social space, and it is that platform's success in meeting the need of people to come together that has driven its success and popularity.

The second trend is the ever-improving ability of our computing and communications devices to represent data and information visually across three dimensions, and to distribute that information in real time over the network. Because of the huge success in the gaming market (which is nearly doubling each year and is predicted to top US $69 billion by 2011), most new computers now have the capacity to render three dimensional images of startling fidelity. Second Life's contribution here has been to extend this capacity over a grid network based on thousands of servers so that a virtual world of considerable size and complexity can be rendered in real time and shared among tens of thousands of simultaneous participants.

Second Life is unique among the emerging virtual worlds because it also capitalizes on a third major trend — allowing users to generate content — which also the driving force behind such Web 2.0 phenomena as YouTube, MySpace, and Flickr. This has fostered a tremendous sense of ownership and pride among participants that in turn fuels the growth of the community.

It is hard to underestimate the complexity of the task Linden Lab has set upon, and as noted before, while virtual worlds have developed to the point where there are already many compelling examples and a large number of persuasive applications to which they have been put, all of them are at the very earliest stages of their development.

Nonetheless, the growth over the last two years has been remarkable — the number of Second Life accounts has increased by 86 times over that period, from 150,000 in January 2006 to over 13,000,000 today — the adoption of the technology is still an order of magnitude or more away from the numbers commonly associated with the 2D Internet.

At any given moment, more than 50,000 people from countries across the globe are actively engaged in Second Life, and those number are growing steadily. Just in the past week, more than 420,000 people spent time in that virtual world; add to those numbers the tens of thousands of people using other virtual world platforms at any given time for which published data are not available.

Despite the relative immaturity of the technology, virtual worlds are clearly compelling to a large and growing number of visitors.

Types of Applications and Services, Commercial and Non-Commercial

Our usage and tracking data show that these visitors are devoting considerable time to the virtual expressions of their lives, especially compared to the amount of time one commonly expects people to spend on a web page, which is measured in seconds. In contrast, the average stay of a visitor to the NMC's virtual campus in Second Life is 42 minutes.

In terms of typical engagement studies, spending three-quarters of an hour on any activity is consummately rare in today's fast-paced world. More than any other aspect of virtual worlds, it is the ability of the technology to keep people's attention that is driving interest in virtual worlds within the education and training sectors, and that interest is widespread. Over the past two years, an estimated 4,000 educational projects have emerged within Second Life alone, and of the 13,400 regions in Second Life that were active at the time of this writing, more than 1,400 of them were being operated by bona fide educational institutions. Add to this more than a hundred other projects on open-source platforms like Project Wonderland, Qwak, and Croquet.

Education is growing so fast in virtual worlds that it is no longer possible to maintain an accurate list of all the examples of education and training that exist. Immersive, high-fidelity examples can be found in dozens of fields and disciplines, and the list grows daily. Among the fields in which many examples may be easily found are these:

- Emergency Response
- Homeland Security
- Health Care and Wellness
- Biotechnology
- Nanotechnology
- Government Outreach
- Civic Participation
- Cultural Awareness
- Global Warming
- The Environment and Ecological Action
- Civic & Economic Development
- Business
- Languages and Cultures
- The Arts

The not-for-profit sector is not yet as active as education, but a number of key organizations, such as the Annenberg, Sloan, and MacArthur foundations, and the American Cancer Society have significant projects, along with hundreds of smaller not-for-profits.

Commercial development in the typical sense of how one might think of it on the 2D web has found less opportunity in virtual worlds, and there have been a few high profile experiments by companies like American Apparel and the Starwood Hotels that did not find the success they hoped for. In other areas, however, the economy of Second Life, while small in overall terms, is doing quite well.

The most notable aspect, as least in the popular press, is the burgeoning micro economy that is fueled by the virtual Linden dollar, which typically trades at about 265 to the US dollar. The latest numbers from Linden Lab identify about 55,000 small business owners operating in Second Life, but this number is somewhat misleading. By far, most make less than US$100 per month; only about 150 individuals actually make more than US$5,000 per month operating businesses completely within Second Life. Most of the businesses that operate within Second Life produce virtual goods that can be used to build out the world, provide entertainment and other services, or customize one's appearance.

A much less chronicled aspect of the Second Life economy involves the businesses operating in the ecosystem of Second Life for whom their work in virtual worlds is a real world enterprise. These companies, of which the NMC is one, operate using real currency, real contracts, and standard business practices. A recent survey by Linden Lab identified about 385 such companies

who together are expected to produce about US$60 million in revenues this year. These businesses employ about 4,400 people who deliver goods and services in the virtual world, but who work and are paid within the real world economy. The average annual revenue projected for these companies in 2008 is about US$156,000. A little more than a third of all the regions added to the grid by Linden Lab are developed using the services of these ecosystem companies.

A Look to the Horizon

Earlier in these comments, I noted that it is important to remember that we are right on the edge of the frontier of the 3D web, and that there are many parallels to the ways in which the 2D web unfolded over the last 15 years. We have many challenges to solve, some technological, but others in the realms of policy, business models, and access. The prevailing view among my colleagues is that the large part of these can be solved most easily by simply letting the visionaries and entrepreneurs working in these fields do what they do well — continue to innovate.

At the same time, there are always things government can and should do for the good of its citizens, and there are moments when leadership and action on the part of government is critically needed. As I noted earlier, when our nation has stood on the edge of opportunity in the past, we have been privileged to have had leaders with the vision to allow us to capitalize on it. This is one of those times, and we sorely need that sort of leadership right now.

What can Congress do?

First is to explicitly recognize that increasingly, telecommunications and the Internet are the same thing. For many of us, our phones are already our portal to the Internet, and in an industry that produces a billion mobile phones a year, that is fast becoming the norm. The devices themselves are already far more powerful and capable than the networks that connect them. We need regulations that decouple cell phones from calling plans and promote the growth of a truly world class wireless infrastructure.

From that starting point, we need a range of action informed by vision and clarity of purpose. What is needed most are these five things:

- programs that will spur the technical development of the 3D Internet;
- programs that add capacity to the woeful state of our information infrastructure and bring it to the communities and neighborhoods that currently have no or very poor access to broadband services;
- policies that require data and cellular networks to deliver the bandwidths and speeds needed to easily access these technologies;
- programs to ensure that educational institutions and students at all levels have the resources required to take full advantage of the potential of the 3D web; and
- programs and policies to encourage entrepreneurs to develop effective business models for this new frontier.

Beyond those vitally important actions, what is further needed is for government to engage the technology, to model effective uses of virtual worlds, and to promote programs and services that truly tap its potential to bring people together. This subcommittee, which focuses uniquely on the special issues embedded in telecommunications and the Internet, is the perfect place to start.

Imagine a future where conversations like this could be routinely held in a virtual world, where we understood that the technology not only provided the setting and forum for dialog, but was also seen as an energy-saving strategy, a cost-saving strategy, a boon to the environment, and a way to engage citizens directly in complete safety.

Imagine a future where complex scenarios like those that occur in emergency response or homeland security situations could be practiced over and over, just as pilots train to fly in unpredictable weather conditions.

Imagine a future in which learners did not just read about scientific and mathematical principles, or simply solve problems and equations, but were able to see and manipulate them in real time and space — a future where the elegance, beauty, and consummate practical applications of these disciplines are easy to see.

Imagine a future in which the disabled, sick, or simply frail easily interact with able-bodied people on the same terms, with the choice to set the wearying challenges of their conditions aside, or to join with others just like themselves — a future where even the autistic can find a voice, and barriers of illness or infirmity fall away, even if only for a time.

That future is here today. Each of these scenarios can be matched to the work that hundreds of talented passionate people are doing right now in Second Life, and the extraordinary things they are accomplishing highlight the profound potential of this technology.

The future of virtual worlds that is yet to unfold is one that promises an exponential leap over what is possible with the technology today. Cinematic quality graphics are just over the horizon, as well as seamless integration with business and other applications. Advances in social operating systems, mobile devices, and wireless technology will extend the 3D web in ways that will weave it transparently throughout our lives. That web will connect us to each other, to goods and services, and to knowledge and information in ways we can only begin to imagine today.

We stand at the frontier of that soon-to-come future today, and before us lies opportunity in every direction. Let's make the most of this moment.

Thank you for allowing me this time to reflect on its profound potential with you.

References

Compendium of Virtual Worlds
Federation of American Scientists
http://vworld.fas.org/bin/view/Main/VirtualWorlds

Game Industry Expected to Double by 2011
Gamasutra, February 2006
http://www.gamasutra.com/php-bin/news_index.php?story=8205

Metanomics Interviews Mitch Kapor, Linden Lab's Board Chair
Metanomics, March 2008
http://metanomics.net/26-mar-2008/special-event-friday-metanomics-interviews-mitch-kapor-linden-labs-board-chair

One Billion Mobile Phones Shipped in 2006
Computing, January 2007
http://www.computing.co.uk/2173516

Second Life Economy
http://secondlife.com/whatis/economy_stats.php