



Gig.U

The University Community Next Generation Innovation Project

Gig.U Y2:

***From Next Generation Network Test Beds
to the
Information Economy Ready Community***

Two Weeks Ago

Every summer, about three dozen city officials, from across the United States, gather for three days at the Kennedy School of Government to collaborate on issues facing cities today. On the last day they go around the table and identify to dive into at the next gathering. The word map from last summer's gathering identified fairly traditional issues municipalities face: development, innovation, technology and education. The word map from last weekend's session included those issues but also included as one of the top three words an issue not found on prior maps. That word? Fiber.

Two Years Ago

Most municipal officials did not regard next generation networks to be priority issue when, two years ago, three dozen university communities came together to accelerate the deployment of next generation networks to drive economic growth and improve quality of life.

Like all great American journeys, the Gig.U Project began with vision, energy and optimism but no map.

Now, two years later, the outlines of that map have emerged. Its contours do not match precisely what emerged in initial discussions. Again, like all great journeys, this one has required constant attention and course correction. But Gig.U has led to nearly a dozen communities stimulating millions in investment in networks and tens of millions more in enterprises based on those networks.

On the Project's second anniversary, it is appropriate to review the journey and plot out a course for the future. Nothing is certain, but as others have said, and as experience demonstrates, "a plan beats no plan."

The South Side Gets \$150M Worth Of Fiber Internet And Other Tech

Gigabit Squared is looking to transform nine Chicago neighborhoods, and just keep growing from there.

Sandra Guy, ChicagoGrid.com

"Technology projects worth \$150 million will transform nine South Side neighborhoods by 2015 with a data center, a job training center and ultra-high-speed Internet connections that will bring Chicago's fastest fiber and wireless broadband capacity to 100,000 residents and 11,000 schools, businesses, hospitals and clinics, the project's leader says[...]"

Full story [here](#).

Background—Phase One and Phase Two

Getting a Gigabit without Google

There are as many models for accelerating the deployment of networks in a community as there are localities in the United States. Brian Fung of the *National Journal* profiled Gig.U communities Seattle and Chicago in his May 16th, 2013 story, *How to Get Google Fiber—Without Google: The trick is to get a university on your side*:

“[...]Here’s how it generally works. A local university helps identify neighborhoods interested in, and that would be well served by, a next-generation network. It then partners with an outside vendor to help finance and build the infrastructure. Meanwhile, the city government becomes actively involved in the consultation and permitting process.

Every city where Gig.U works, it works differently. Seattle, for instance, was an early pioneer of fiberoptic networks. In the 1970s, the city installed fiberoptic cables in the street whenever construction crews ripped up the ground. About one-third of the city now has access to fiber, Levin told me, but much of it is “dark” and unused.

That’s where Gigabit Squared comes in. As the outside vendor partnering with the University of Washington, Gigabit Squared is leasing a substantial portion of Seattle’s existing fiber and is building out connections to people’s homes. Fourteen test neighborhoods in Seattle will be getting fiber connections, according to Mark Ansbury, Gigabit Squared’s president and cofounder. Partly thanks to the city’s forethought decades ago, the cost of bringing fiber directly into the home is a fraction of what it would be[....]”

Read the full story [here](#).

This Project ran in two phases, both financed through contributions from member universities and communities. In each phase, the Project produced specific deliverables that were best delivered collectively; thus the expense was justifiable to the institutions. Further, members did not want to accept any outside funds that would affect the analysis of how to proceed in deploying next generation networks.

In Phase One, the Project issued a national Request for Information (RFI) as a market check to determine how communities might improve the economics of network upgrades and deployments. The 50-plus responses suggested ways that member communities could move forward. And the responses, while not charting an easy or certain path, revealed paths that communities, particularly those that wished to be early pioneers, could take. More details can be found in Gig.U’s first [Annual Report](#).

In Phase Two, the consortium created tools to help communities improve the case for investment in next generation networks and helped the first set of projects get off the ground. In every community where the leadership said, “yes, we’d like to do this,” the next question was “how do we start?” The tools are part of the answer, but so were lessons learned from other communities. There is no standard deal or contract; nor is one likely to materialize. But every community that controls their bandwidth destiny makes it easier on all levels—economic,

technical and political—for those who wish to do the same for their own community. More details on Phase Two can be found in the [Midyear Report](#) from last February.

The Wrong Broadband Debate

In the last year, it has been heartening to see increased recognition of the need to upgrade networks from leaders in government but with it has come another broadband policy discussion Gig.U has not entered. That debate, the subject of several stories and op-eds, centers on where the U.S. *is* instead of where it *needs to be*. The major quarrel is over today's rankings in international broadband metrics. But that discussion looks backward, only implicating the policies of previous generations.

Leaders and policymakers should be asking: “what do we need to do today to lead 5, 10 or 15 years hence?” That question is what will lead the U.S. in the right direction. That question is answered by local leaders, who know that part of the solution is driving fiber deeper into the networks.

Cisco CEO John Chambers, commenting on his company's investment in a project that will build a gigabit network throughout Israel, noted that one justification for that investment was that Israelis leaders “understand the need to get ready for the future.” So do leaders in Gig.U communities, whose actions, hopefully, will affect the debate so that Mr. Chambers can say the same thing about this country as well.

These efforts have led to almost a dozen Gig.U member communities announcing plans for next generation networks, with another dozen considering how to move forward. In addition, the Project has developed a comprehensive community toolkit based on lessons learned from early Gigabit Communities (a description of the tools is found in Appendix A), catalyzed a project to use unlicensed spectrum to upgrade connectivity to rural college communities (see the sidebar on the University of West Virginia Project) and launched a national conversation on the topic of next generation networks. In contrast with the environment when the Project launched, government leaders—from the President, to the Congress, to Governors and Mayors—are calling for upgraded networks throughout the country to meet future bandwidth needs and provide a nurturing environment for innovation.

The Gig.U Project was not intended to create a lasting institution. Rather, it was designed as a short-term catalyst to experimentation, allowing communities acting collectively to take those steps which they could not take alone while having local communities proceed as appropriate.

Gig.U has accomplished its goal—accelerating the deployment of affordable next generation networks—and could now step back and watch as local efforts create test beds for next

New York Times Columnist Thomas Friedman on the Metropolitan Revolution:

“The new growth model, which the most successful cities are practicing, focuses on creating networks that combine skilled laborers and knowledge workers, with universities and technical schools, with quality infrastructure and high-speed Internet, to do manufacturing, innovation, technology development and advanced services — with an eye to exporting all of them. That's how we build a 21st-century middle class....]”

Full piece [here](#).

generation networks and applications. But there are important tasks this group can accomplish, like sailors who, having reached the horizon, now see another in the distance.

The Challenge: Not just for research university communities anymore

Gig.U began as an effort to aid research university communities and the country build a strategic bandwidth advantage over international competition by developing a critical mass of communities with world-leading bandwidth.

That is a big ambition. But it is not ambitious enough.

As goods and services rely increasingly on broadband for distribution, and economic value creation increasingly happens on this platform, many—if not all—communities must take a different approach to their broadband infrastructure.

Research university communities may need more bandwidth, per capita, than many other communities, but upgrading networks is essential for all communities who wish to fully participate in and realize the benefits of this emerging economy.

Kansas City, Chattanooga, Seattle, Chicago and other communities have shown how universities can be critical to stimulating an upgrade and that the process can tap into a reservoir of community support for improvements in infrastructure crucial for economic development. University communities are good test beds for such projects because they are home to a large number of facilities and stakeholders with critical assets and potential demand for services.

But while universities are useful partners, they are not a solo actor. As a recent book on local governments, “The Metropolitan Revolution” notes in discussing the importance of economic clusters for job creation, “Universities do not usually by themselves create clusters, but they can be powerful factors in maintaining and energizing them.” The book goes on, “Universities

Google Fiber and University Communities

Austin, the second city to get the nod from Google for its fiber service is home to one of the top 5 largest universities in the United States, The University of Texas. To those involved with Gig.U, that seems like no accident but rather confirmation of the hypothesis that university communities have a mix of demographics and assets that make them attractive sites for investment.

In the [words](#) of Google’s Vice President for Access Services, Milo Medin:

“[Austin is] a mecca for creativity and entrepreneurialism, with thriving artistic and tech communities, as well as the University of Texas and its new medical research hospital. We’re sure these folks will do amazing things with gigabit access, and we feel very privileged to have been welcomed to their community.”

Gigabit Seattle Gets Real

Six months after announcing a partnership with the City of Seattle and the University of Washington to bring a symmetric gigabit service to Seattle’s residents, digital economic development company Gigabit Squared [announced a price point](#) for that service: \$80 a month. That is \$20 cheaper than the closest comparable (but slower) service in the region.

A month later, this July, the company [announced](#) a multi-million dollar investment with an asset and conduit provider, Zayo.

are most effective at shaping a local economy when they are part of a larger ecosystem of innovative activity.”

In the experience of Gig.U, no single part of any community enables or uses a network. But the whole of the community, working together, provides the force to enable its deployment. The focus of any project, therefore, should be how an upgraded network will help solve problems throughout the community.

Yes, university communities have a lot of advantages, and it is not an accident that Google chose university communities for its [second](#) and [third](#) fiber deployments. But while university communities will likely lead in deploying next generation networks, any community that wants to can organize to support a next generation network. Most communities have anchor tenants and many communities have existing assets to help drive down the costs of deployment. Every community faces challenges in transportation, housing, energy, health care and economic development that could be made better through the use of information delivered over bandwidth. And making the available bandwidth faster, cheaper and better makes all those tasks easier. Further, tasks that cities routinely do today, from zoning to road maintenance, from rights-of-way management to construction permitting, can be modified to improve the economics of deploying next generation networks, even before a specific provider is identified.

Increasingly, community leaders are attuned to those facts. This is not a question of being in a tech hot bed, as demonstrated by the early success in Kansas City. Nor is it a question of being a major urban center. It is a question of planning; asking what one can do today to make it easier to obtain those networks in the future.

As other communities ask the question, they will look to Gig.U communities for answers—whether it be the fiber deployment strategy that assisted Seattle, the utility/real estate partnership that aided [Gainesville](#), the regional

North Carolina Next Generation Networks—NCNGN—Takes Off

Early in the year, the communities of Cary, Chapel Hill, Carrboro, Durham, Raleigh, and Winston-Salem with the support of their [Gig U](#) partners of Duke University, NC State University, UNC Chapel Hill and Wake Forest University along with their associated Chambers of Commerce launched a regional partnership to bring next generation networks to the area. The partnership, called NC Next Generation Networks (NCNGN, pronounced “NC Engine”), issued a Request for Proposals and [received responses from eight different entities](#).

Nation's first campus 'Super Wi-Fi' network launches at West Virginia University

[“West Virginia University](#) today (July 9) became the first university in the United States to use vacant broadcast TV channels to provide the campus and nearby areas with wireless broadband Internet services.

The university has partnered with AIR.U, the Advanced Internet Regions consortium, to transform the “TV white spaces” frequencies left empty when television stations moved to digital broadcasting into much-needed connectivity for students and the surrounding community.

The initial phase of the network provides free public Wi-Fi access for students and faculty at the [Public Rapid Transit](#) platforms, a 73-car tram system that transports more than 15,000 riders daily[...]

Read the full story [here](#).

approach at the heart of the North Carolina effort, or the community outreach efforts taking place in the neighborhoods around the University of Chicago, the University of Illinois at Champaign-Urbana and Michigan State University. Others in more rural areas may look at a project using unlicensed spectrum (or, White Spaces) recently launched by our member, the University of West Virginia, and our sister organization, AIR.U. Collectively, these efforts constitute a map that can aid any community charting their own path.

If city leaders 100 years ago had perfect foresight, they would have made certain plans—setting aside land for an airport, designing for roads that could handle combustion vehicles, ensuring long-term access to water and inputs for electricity—that would ensure fewer hardships and more sustainable communities today. Today, as city leaders make plans for the Information Age economy, they need to make plans that ensure the community has the bandwidth it needs.

What Gig.U has done over the last few years—and what its members will do in the next few as well—will provide a model for becoming an Information Economy ready community.

And while not every city will act on it, what we have learned and done carries an urgent and simple bottom line for all cities: ***many things every community does today will affect what kind of broadband networks it will have in ten years; in ten years, whether it has faster, cheaper, and better broadband networks will affect everything that community does.***

The future for Gig.U

As noted above, Gig.U was not intended to become a permanent institution.

There are, however, certain tasks that Gig.U is well-situated to perform that helps advance its mission. These include:

- ***Maintaining the learning community.*** Gig.U has developed into a community of leaders that through monthly calls, a web site, and group e-mails, help each other anticipate and resolve common issues. Continuing this learning community and expanding it to other communities would be productive to the mission.
- ***Improving and disseminating tools.*** The first sentence of the implementation chapter of the National Broadband Plan says: “This plan is in beta and always will be.” So it is with the tools Gig.U created. They were designed to be improved upon as each community uses them. But some entity must have the ability and responsibility to coordinate and curate the use of the tools. Further, it would be valuable to have a wider dissemination of the tools.
- ***Thought leadership for the deployment and use of next generation networks.*** As more communities attempt to upgrade their bandwidth, there will be political push back, particularly from those whose business model could be challenged by those efforts. Gig.U’s members have already played a significant role in articulating the need for faster, cheaper, better bandwidth. While Google’s efforts garner most attention, there is significant value to have a non-economic actor articulate the message. Gig.U has played a substantial role behind the scenes in addressing the issues with local, state, and

federal policymakers as well as opinion leaders, a task that will probably require more attention as more communities consider moving forward. Already, the Project has been involved with others in addressing a broader audience of city leaders. Gig.U co-sponsored a conference, with the Fiber to the Home Council and Google Fiber, among others, to discuss how to move from *Gigabit Envy to Gigabit Deployed*. The conference attracted over 400 attendees and [featured](#) a number of Gig.U [members](#). In addition to speaking to a range of different community groups, from [Broadband Communities](#), to the [Schools, Health & Libraries Broadband Coalition](#), to the [Wisconsin Broadband Summit](#), Executive Director Blair Levin also recently spoke at the Urban Policy Advisory Group, a collection of about three-dozen Mayoral Chiefs of Staff who gather annually at the Kennedy School to collaborate on problem solving for the 21st Century city. (A summary of his comments, designed for distribution to and discussion with city officials, is attached at Appendix B.) Next month he will be making a similar presentation to a group of mayors who are gathering to discuss how to meet the future bandwidth needs of their communities.

Continuing the work

The best avenue for continuing the work is unclear, at this point a certain ancient wisdom rings true: “you are not obligated to complete the work, but neither are you free to abandon it.” In the case of Gig.U, the existing membership has moved the process forward, particularly for their own communities. As the mission broadens beyond test beds for next generation networks to models for the information economy ready community, it is fortunate that others have undertaken this task so that, like a number of streams coming together to form a mighty river, Gig.U’s efforts are part of a larger force. In the days ahead Gig.U leadership will find ways to continue the work, to continue refining the map, and to join with others who wish to lead bringing world-leading broadband networks to the United States.

Gig.U wishes to thank Charlie Firestone, Tricia Kelly and all the staff of the Communications and Society Program of the Aspen Institute for their support.

Appendix A

Community Toolkit

- **A Community Assessment Worksheet**, primarily designed for city administrators, provides a comprehensive list of assets and opportunities for cities to improve the conditions for investment in networks—by reducing capital expenditures, lowering potential operating expenditures, decreasing risk or increasing potential revenues.
- **A Demand Identification Website**, designed to assist those in charge of local outreach efforts, allowing communities to assess the interest of community members in upgraded networks through a generic, customizable web site.
- **Generic Request For Proposals and Generic Request for Information Templates**, designed for municipal attorneys, providing templates for communities that wish to discuss paths for an upgrade (the RFI) and for those who wish to move to the next phase and negotiate with a service provider to deploy an upgrade—amongst other options (the RFP).
- **A Strategic Memo**, designed for community leadership that discusses common issues and opportunities such as issues involved with dealing with owners of multiple dwelling units, business leadership, and rights of way.

Appendix B

Upgrading Broadband Networks: One Formula, Three Strategies, Four Tools and One Bottom Line

One Formula

Q: Why don't American communities have world leading wireline broadband networks?

A: The math of investing in an upgrade, specifically:

$$C+O > (1-r)R + SB + (-CL)$$

That is, for all the current and potential players, the sum of CapEx and OpEx for a next generation network is greater than the risk adjusted revenues plus system benefits plus the threat of competitive losses.

To improve the investment opportunity, reverse that equation by taking actions that reduce CapEx, OpEx and risk and increase revenues, system benefits and competition.

Some actions should be taken without a counter-party willing to deploy a next-generation network; some should only be taken if there is a counter-party willing to deploy such a network.

Three Strategies

Asset utilization and improvement.

- Inventory assets that if better utilized or improved could lower the cost of deploying next generation networks (rights-of-ways, utility poles, conduit, buildings, etc.).
- Make data and other information available regarding conduit, ducts, and other rights-of-way, as well as government-controlled facilities to which providers can attach equipment.
- Establish policies that make rights-of-way and poles available to providers on a clearly defined, reasonable basis through a rapid approval process.
- Ensure that make-ready work is done expeditiously, coordinate with new providers to save costs and allow them to perform the work themselves through approved contractors.
- Adopt Dig Once rules and proactively install ubiquitous fiber conduit—and even dark fiber.

Regulatory flexibility to accommodate new business models

- Allow neighborhood-by-neighborhood builds through pre-commitment strategy.
- Expedite permitting and inspections to reduce stoppage time.
- Pre-approve novel construction methods like microtrenching.

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- Use single point of contact.

Demand Aggregation

- Tie build out to aggregation.
- Target areas for big bandwidth.
- Use tools to enable areas to self-organize.
- Organize anchor institutions, key economic beneficiaries.

Four Tools

A Community Assessment Worksheet

- Primarily designed for city administrators.
- Provides a comprehensive list of assets and opportunities for cities to improve the conditions for investment in networks.

A Demand Identification Website

- Designed to assist those in charge of local outreach efforts.
- Makes it easy for communities to assess the interest of community members in upgraded networks through a generic, customizable web site.

A Generic Request For Proposals and Generic Request for Information

- Designed for municipal attorneys.
- Providing templates for communities that wish to discuss paths for an upgrade (the RFI) and for those who wish to move to the next phase and negotiate with a service provider to deploy an upgrade (the RFP).

A Strategic Memo

- Designed for community leadership.
- Discusses common issues and opportunities such as issues involved with dealing with owners of multiple dwelling units, business leadership, and rights of way.

One Bottom Line

Many things every city does today will affect what kind of broadband networks it will have in ten years; in ten years, whether it has faster, cheaper, better broadband networks will affect everything that city does.