

1. Describe your vision for ultra High-speed Internet in your area

Every day in America, water flows from faucets in most parts of the country without much thought or consideration. There is always enough of it, it flows hot or cold, fast or slow, however we want. It's the lowest cost utility, and the most reliable. **Volo Broadband's** expertise as an innovative Internet service provider and installer of fiber infrastructure for the American Recovery and Reinvestment Act gives us a unique vantage point. From that vantage point, *Volo sees the future of Internet service as plentiful, reliable, and low-cost like water.* We are calling this initiative **Just Like Water.**

Gigabit services worldwide are currently only in use by couple hundred subscribers¹. To us, that is no big surprise given their pricing, where recent studies have found that users are willing to pay \$45 per month for “fast speed” vs only \$48 per month for “very fast speed.”² Unless ultra-high-speed services are available at prices users are willing to pay—under \$50/mo—the development of technologies that require those speeds will continue to be stunted.

Through this award, Volo will deploy infrastructure and services that bring ultra-high-speed Internet access within easy reach of over 10,000 users in one greater metropolitan area—the first truly “smart community”. More than a proof of concept, we believe that this will create a critical mass of users receiving gigabit speeds sufficient to catalyze an ecosystem for innovative software application development.

We currently have infrastructure that makes it possible to deliver gigabit speeds to some of our current customers, but in our experience, the affordability of service is just as important as the access itself. If awarded the requested funds under the Illinois Gigabit Communities Challenge, we will be able to extend gigabit-capable infrastructure to areas and users that do not have it today, and more importantly, we will be able to offer ultra-high-speed *Digital Water* services at price points unheard of in the USA. **Just Like Water** goes a step beyond passing homes with gigabit-capable infrastructure: it brings next-generation broadband services into financial reach of the full breadth of users that make up the Central Illinois broadband market.

The combination of expanded ultra-high-speed coverage, Volo's innovative *Digital Water* services, and UC2B's “Open Access” Network will allow East Central Illinois to move beyond being a pilot project for Big Broadband, to becoming the first truly “smart” region of our nation, with the potential to organically grow statewide from that seed.

2. Provide your preliminary technical plan.

Deployment Plan

Volo will leverage existing assets in the form of:

- Existing leased fiber access from Champaign, IL to 350 E Cermack in Chicago, IL
- An existing fiber and conduit backbone that runs through Champaign, Urbana, Thomasboro, and St. Joseph (and beyond)
- An existing conduit network in St. Joseph, IL
- Existing fiber delivery to and access infrastructure within several Champaign, Urbana, and Savoy apartment complexes
- A large stockpile of conduit (108 kft) and fiber optic cable (750kft)
- The UC2B backbone and fiber infrastructure

...with the goal of maximizing the number of new users with access to ultra-high-speed Internet access per Gigabit Challenge dollar. Our overall plan for deploying these services is as follows (note: the below timeframes dovetail somewhat as is evident from the timeline in section 5):

1. Upgrade existing core facilities to 10gbps (currently 1gbps) – 45 days

¹ http://www.ftthcouncil.org/sites/ftthcouncil.org/files/residential_gigabit_subscribers_whitepaper_north_america.pdf

² “Household Demand for Broadband Internet Service.” Rosston, Savage, et al. Communications of the ACM, Vol 54 No. 2, Pages 29-31. 10.1145/1897816.1897830

2. Upgrade existing access facilities to have 1gbps user ports with 10gbps uplinks – 60 days
3. Acquire permits to connect existing conduit network to backbone in SJO – 60 days
4. Build connectivity from existing conduit network to backbone in SJO – 30 days
5. Install fiber infrastructure in conduit in SJO – 30 days
6. Market to first new-fiber customers in SJO – 30 days
7. Acquire permits to build new access conduit infrastructure in Thomasboro and SJO – 60 days
8. Build Thomasboro conduit – 75 days
9. Build SJO new conduit – 120 days
10. Deploy Thomasboro, SJO fiber infrastructure – 60 days
11. Market new services in Thomasboro and SJO - ongoing

What kind of equipment will be used?

Volo's *Just Like Water* project extends existing fiber optic networks to new locations and upgrades existing facilities from 100mbps-1gbps to 1gbps-10gbps using commodity “active ethernet” equipment.

Active Ethernet provides the most flexibility for hardware changes in the future, currently provides the simplest path to ultra-high-speed Internet, has a wide variety of compatible vendors, and is most compatible with other networks in our region.

Who will build the network?

Volo Broadband is an experienced network operator and infrastructure builder. In addition to operating its own network, Volo currently operates the Conxxus wireless and Fiber-to-the-home network. We previously built and still largely maintain the City of Urbana municipal fiber network that connects most municipal facilities and schools, and in the last year we have been the primary local contractor responsible for fiber optic installation in the UC2B network.

Working on the above projects, and specifically with local minority electrical contractor Southern Belle Electric on the UC2B Urbana network and as the primary contractor responsible for citywide fiber-to-the-premise deployment on the UC2B project, Volo has demonstrated its ability to:

- Train (from the ground up) and manage a substantial workforce of fiber installation technicians
- Install fiber infrastructure on a large scale under tight time constraints
- Build fiber infrastructure at dramatically lower prices than standard in the industry (or bid for fiber-to-the-premise installation won by almost \$1M)

By growing local expertise in these areas, we create careers that can foster long-term low-cost broadband deployment statewide. Volo will continue to work with its local partners to grow and manage a sustainable local workforce of fiber and underground construction experts. We will lean on outside expertise for engineering and training support (the latter through our partnership with Parkland College).

Overall, if we achieve the 45% uptake rate for services that we expect (reasonable given that we are already at 25%), this project will allow Volo to support six additional permanent positions—three in fiber infrastructure installation and three in network support. When done with this project, those fiber infrastructure positions will focus on expanding the network to other areas in Central Illinois and eventually statewide.

What areas will the network cover?

The communities included in this proposal cover a medium-sized physical area but a very large demographic range. Our new infrastructure investment will focus on the 535 housing units in Thomasboro, IL (a small lower-middle-class farm community) and the 1522 housing units in St. Joseph, IL (a more-affluent and suburban “bedroom” community to Champaign and Urbana, IL). But **Just Like Water** will also enhance our existing infrastructure to support ultra-high-speed services to 3506 housing units in Champaign, Urbana, and Savoy (a mix of low- and medium-income housing), the 4600 primarily-low-income housing units and small businesses in the UC2B “fiber-

to-the-curb” area, and the 273 social and governmental anchor institution sites being served by the UC2B network in Champaign, Urbana, and Savoy.

Why East Central Illinois

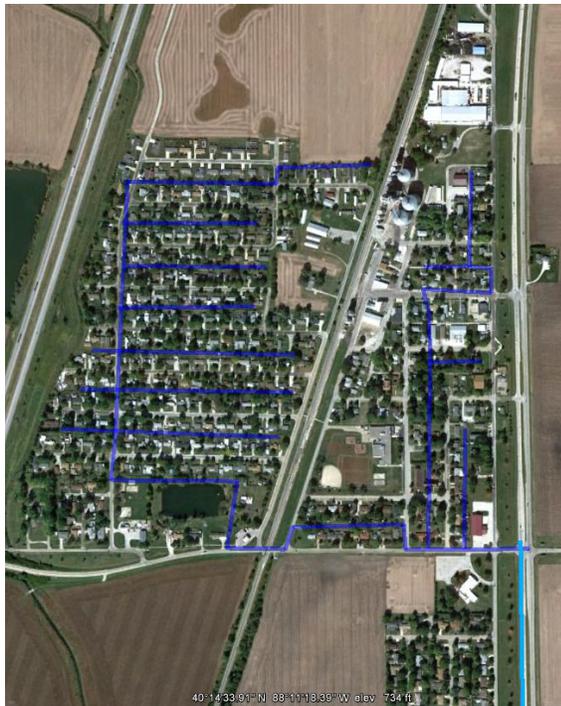
East Central Illinois is the ideal place to plant an ultra-high-speed Internet seed that will allow it to grow statewide. From the communities served by **Just Like Water**, there is a clear, sustainable growth path within Champaign-Urbana and Savoy (up to 35,000 additional premises) and to neighboring towns served by the CIRBN project (well over 50,000 additional premises). If not covered by a Conxxus Gigabit Challenge award, Rantoul and Paxton are easy additions to that list. These areas are ideal candidates for expansion because they all already have the core backbone infrastructure required to get service to and through town cost-effectively. With each new community, we increase the resources available for expansion, eventually allowing entirely unserved areas to be incorporated into the ultra-high-speed footprint.

Another advantage of choosing East Central Illinois as a starting place for ultra-high-speed internet access is the amazingly broad cultural and socioeconomic range of users that this project will serve. This project will demonstrate that subscribers across multiple demographics, in several different competitive environments, respond to ultra-high-speed broadband.

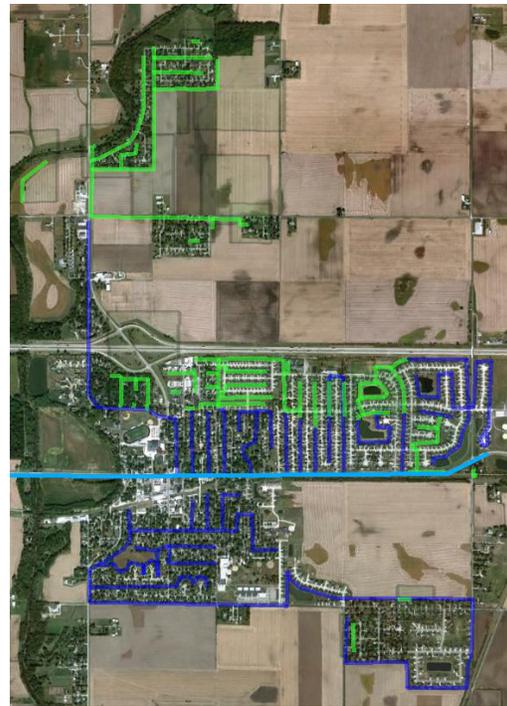
Finally, **Just Like Water** leverages the existing initiatives spearheaded by the University of Illinois in Champaign-Urbana, a founding member of the Gigabit Universities and US Ignite next-generation-broadband initiatives, by doubling the number of subscribers that can benefit from them.

Maps

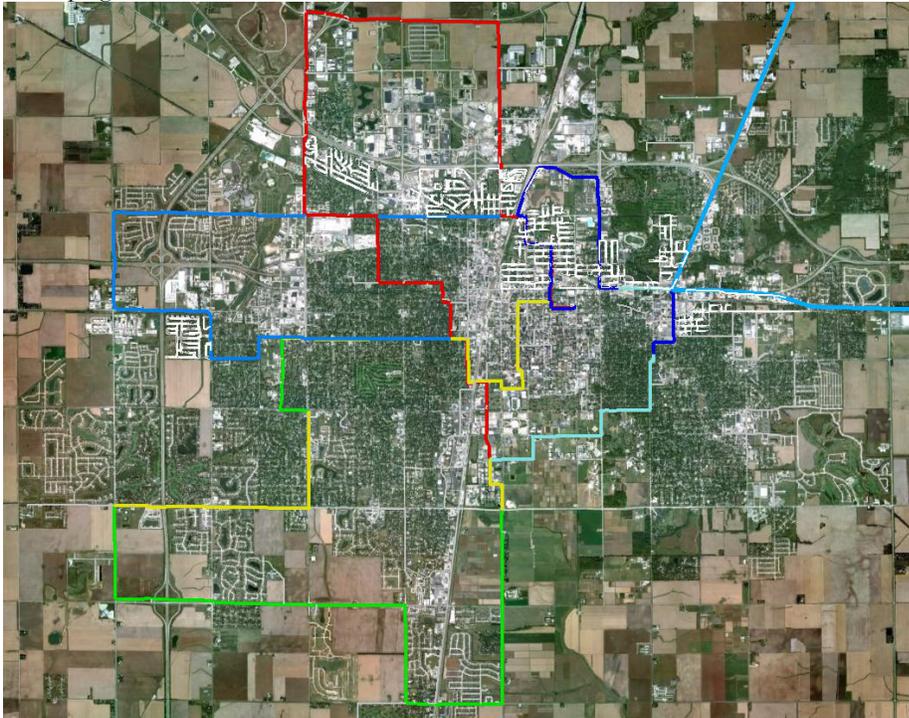
Thomasboro, IL: (blue is new conduit to be built)



St Joseph, IL: (green is existing conduit)



Champaign-Urbana: UC2B and Volo backbones:



3. What transfer speeds will be available to users of your proposed network?

Volo currently provides a range of services at a range of prices, from consumer-level wireless Internet access at 2mbps-20mbps for \$30-\$90/mo, to consumer-level fiber access at 2mbps-100mbps for \$10-\$125/mo, to commercial services priced around \$10/mbps into the hundreds of mbps.

We will extend these “traditional” services to the new network, adding consumer-level service tiers at 200mbps for \$175/mo, 500mbps for \$225/mo, and 1000mbps for \$325/mo. Speeds up to 10gbps will be available at lower prices through this network than they are currently otherwise available, but services faster than 1gbps will require custom pricing and engineering.

Though we will offer them to remain competitive, as explained previously we believe that widespread adoption of ultra-high-speed Internet access is incompatible with these “traditional” pricing models. In order to promote true, wide-spread, ultra-high-speed Internet adoption, **Just Like Water** will allow Volo to offer a new *Digital Water* service that we believe will bring gigabit speeds and guaranteed performance “to the masses” for the first time, worldwide.

Digital Water

This new service is designed to solve two problems:

- The high price point and relatively weak value proposition for ultra-high-speed services (few technologies demand such speed, so people spend their dollars elsewhere)
- The gap between marketed (usually maximum) speed and actual typical speed seen by users that prevents them from knowing easily what they can and can not reliably do on the network. (As discussed in the whitepaper referenced as ¹ above, that gap is caused by a variety of issues, from computer hardware to home network design to provider capacity to website performance.)

Digital Water is designed to offer reliability, performance, availability, and low pricing sufficient to allow users to forget about the complex infrastructure behind its delivery. It's designed to dramatically simplify internet access purchasing, while lowering the price point that ultra-high-speed Internet access is available at.

Digital Water works like this:

- Users purchase *minimum guaranteed bandwidth* at an affordable price point of \$10/mbps. This allows them to ensure, based on the services they use regularly, that they will always have enough capacity to use those services. For example, if a very heavy user wants to ensure they can always watch Netflix on two independent devices and video chat at the same time, they need 6mbps of guaranteed minimum bandwidth for a total monthly bill of \$60/mbps.
- Bandwidth not actually used by a given user is tracked using a common bandwidth metering technology known as a *token buffer* system. Under this system, each mbps that you do not use for an hour gives you 450MB of “credit” to use at a later time at the full gigabit available on the network (up to a maximum of 11GB over 24 hours). For a very heavy user that watches 10 hours of Netflix daily, the net result is that they would be able to utilize the full gigabit speed of their connection 99% of the time for only \$20/mo.
- Users may purchase equipment protection in the form of remote and on-site service agreements to ensure that their networks and devices are set up to allow them to fully utilize their available speed.

With this system, a light user might only need 1mbps (\$10/mo) for email, web pages and their VoIP phone, but would still have access to the full gigabit speed so long as they aren't using that 1mbps connection all the time.

This system ensures that the provider can afford to expand total capacity as demand for minimum guaranteed bandwidth increases, without penalizing users for the fact that most Internet connections are idle most of the time. By analogy to physical water, *Digital water* pricing is based on usage, not the size of the pipe. Heavy users pay more than light users, but the service is provided at a cost that makes typical usage very low cost. It improves on normal pricing of physical water by making it impossible for a “leaky faucet” to result in a significantly higher-than-expected water bill.

4. How many end-users will your network service?

Location	New Coverage or Network Upgrade	Premises Passed
Thomasboro	New	535
St. Joseph	New	1522
Urbana	Upgrade	1488
Champaign	Upgrade	2000
Savoy	Upgrade	358
UC2B	Upgrade	4873
Total		10776

We want to make clear that, though only 2057 of those premises are completely new fiber builds, another 3846 have no gigabit capability today, and none of the over ten thousand premises that will ultimately have access to *Digital Water* service have access to gigabit services today or currently-planned gigabit Internet access offerings. Of the total number of premises we will pass with these services, over 2500 are current subscribers to some service, leading to an immediate 25% adoption rate and almost guaranteeing sustainability.

All together, **Just Like Water** will extend ultra-high-speed, *affordable* Internet access to over ten thousand premises at one-time cost of less than \$100 per premise.

5. Preliminary budget.

Grant-funded items				
Item	Qty	Unit	Cost	Ext. Cost
Updates to core switching infrastructure	2	ea	\$ 24,000.00	\$ 48,000.00
Thomasboro conduit infrastructure	18000	ft	\$ 5.00	\$ 90,000.00
Updated access ports	3846	ea	\$ 75.00	\$ 288,450.00
St Joseph new conduit infrastructure	67000	ft	\$ 5.00	\$ 335,000.00
UC2B backbone ring infrastructure IRU	67.5	mi	\$ 3,000.00	\$ 202,500.00
Total Grant-funded infrastructure				\$ 963,950.00
Matching funds and resources				
Champaign-Urbana-Thomasboro-SJO backbone network	20.5	mi	\$ 26,400.00	\$ 541,200.00
1.25" conduit	108000	ft	\$ 0.60	\$ 64,800.00
Drop cable	750000	ft	\$ 0.10	\$ 75,000.00
2gbps network connectivity	18	months	\$ 8,500.00	\$ 153,000.00
Town and Country network infrastructure	638	units	\$ 150.00	\$ 95,700.00
St. Joseph existing conduit infrastructure	44082	ft	\$ 5.00	\$ 220,410.00
Total contributed matching resources				\$ 1,150,110.00

6. Partnerships

Volo Broadband's public-sector partners in **Just Like Water** are:

- The Villages of Thomasboro and St. Joseph, IL
As the focus of new construction, these governmental entities will facilitate access to right-of-way and help organize information sessions for residents of their communities.

Contacts:

Village of Thomasboro:

Mayor Anthony Grilo
217 643-2675
101 W. Main St.
Thomasboro, IL 61878

Village of St. Joseph:

Mayor B.J. Hackler
mayor@stjosephillinois.org
207 E. Lincoln
St. Joseph, IL 61873

- Parkland College
Volo and Parkland currently work together to close the digital divide in Central Illinois: Through our existing Parkland/Volo Digital Equality Initiative (<http://volo.net/equality>), we improve access to low-cost computer hardware, while Parkland's DCEO Digital Divide Grant funded activities help improve digital literacy.

As part of the **Just Like Water** initiative, Volo and Parkland will also work together to develop training, apprenticeship, and career development programs for broadband technicians. In addition, the users of the **Just Like Water** network will have gigabit access to Parkland, improving their ability to participate in Parkland's many online classes.

Contact:

Executive Director, Workforce Development at Parkland College
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Champaign, IL 61821

- The Urbana-Champaign Big Broadband (UC2B) Project

As an "open access" network, part of UC2B's mission is to encourage innovative third-party providers like Volo, and innovative services like those that will be offered under the **Just Like Water** initiative. Part of the UC2B vision that has not yet been realized is promotion of new applications for ultra-high-speed Internet including eHealth and green applications. The **Just Like Water** initiative will provide thousands of additional users with access to the eHealth and green applications that develop over time around the UC2B network. In addition the **Just Like Water** initiative will provide thousands of area residents with improved gigabit-speed access to the 273 local social anchor institutions that will be served by the UC2B network, including health care facilities, churches, retirement communities, schools and colleges, and those 273 anchors with improved access to thousands of potential or current constituents.

Contact:

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Urbana, IL 61801

7. Assuming you receive your state award by July 31st, 2012, What is your estimated project timeline

August 1 – September 15:

- Upgrade existing core facilities to 10gbps (currently 1gbps)

August 1 – September 30:

- Upgrade existing access facilities to have 1gbps user ports with 10gbps uplinks
- Acquire permits to connect existing conduit network to backbone in SJO

October 1 – October 31:

- Build connectivity from existing conduit network to backbone in SJO
- Market *Digital Water* to Champaign-Urbana area users

November 1 – November 31:

- Install fiber infrastructure in conduit in SJO
- Market to first new-fiber customers in SJO

November 1 – December 31:

- Acquire permits to build new access conduit infrastructure in Thomasboro and SJO

January 1 2013 – March 31 2013:

- Build Thomasboro conduit

April 1 2013 – July 31 2013:

- Build SJO new conduit

August 1 2013 – September 30 2013:

- Deploy Thomasboro, SJO fiber infrastructure
- Market new services in Thomasboro and SJO - ongoing

8. What leaders and/or organizations in your community support this proposal?

See attached letters of support.

Bill Dejarnette

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Deborah Lissak

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Anthony Grilo

Mayor, Village of Thomasboro
217 643-2675
101 W. Main St., Thomasboro, IL 61878

B. J. Hackler

Mayor, Village of St. Joseph
mayor@stjosephillinois.org
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Charlie Smyth

Urbana City Council, Ward 1 Councilmember
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csmyth@sbcglobal.net

Tammie Ruff
Director of Community Services, Housing Authority of Champaign County
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205 W. Park Avenue, Champaign, IL 61820

Janice Mouschovias
Director, English Center USA
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staff@englishcenterusa.com / 217 344-3310

9. What technical, business and other strategic resources will you bring to this project?

Gargoyle Technologies D/B/A Volo Broadband has been providing Internet service in Champaign Urbana for over ten years. In addition to our own network, Volo currently provides bandwidth and other operational support for Conxxus, Wigi Wireless, Silver IP, Connectivity U (local and regional Internet Service Providers) and Sotel (a large St Louis based VoIP telephone service). In addition, Volo works with local entities to deploy fiber infrastructure that suits their needs.

Members of our team have been responsible for construction of private ISP networks and updating and expanding existing fiber networks, with hundreds of miles of fiber construction, and thousands of terminations, over ten years. These projects include:

- Urbana portion of UC2B Backbone Fiber
- UC2B fiber to the premises (whole network)
- Conxxus middle mile conduit backbone
- Fiber to the City of Urbana
- Fiber to Urbana School District 116
- Design and deployment of the Volo Broadband fiber network

Volo's commitment to developing in-house competence through work experience in diverse areas related to network design, deployment, and management have contributed to our expansion into a wide diversity of communications spaces. We have deployed direct buried, ducted, aerial, tower-mounted, and inside premise fiber systems, using both industry standard and novel techniques as are appropriate to a given task. Our Director of Underground Operations deployed hundreds of miles of conduit and fiber before joining Gargoyle Technologies. For this project, we will be leveraging in-house expertise in fiber infrastructure installation and management in addition to our CEO's network deployment philosophy, *Fiber on a Shoestring*, which will be presented at the Illinois Broadband Council's conference this September.

Over the years Volo has developed a reputation as the go-to company for high quality, comprehensive Internet Service. Our experience with managing our own infrastructure led us to develop unique monitoring and data management systems to allow us to keep track of multiple networks, document network changes in detail and in real time via web and smartphone interfaces, and troubleshoot the networks on site or remotely. We have successfully leveraged those systems to document and monitor other networks, being the authoritative repository of fiber information for the City of Urbana and the Urbana School District. The data in this system can be accessed either directly from a computer or smartphone, or can be exported in KML, ESRI/ARC, and other data formats. Because of the interactive nature of this system, it is not amenable to providing "documentation samples"—instead we invite you to try it out. Contact Peter Folk (pfolk@gargtech.com / 217 721-3893) to set up a guest login and demonstration.

Gargoyle Technologies Inc. provides 24x7x365 support for all of the customers of its Internet service provider operation, including proactive monitoring of our own fiber infrastructure. We understand the issues surrounding supporting customers in a live fiber plant, and have technicians on call and representatives waiting by the phone at

all times, capable of diagnosing problems and directing their solution as appropriate (whether that means one person fixing the problem with a splice, or a team of people excavating a cable, installing a new handhole, and using mid-span entry to fix a few broken strands without disturbing others.

Our primary expertise is in the more technical areas: fiber design, installation, testing, monitoring, and repair. We outsource engineering and construction services to companies that specialize in the particular type of construction or other services we need for each job, from a roster of contractors we have worked with over the years. Outsourcing those services allows us to focus on the technical areas with highly-mobile technicians, while drawing on local resources when heavy equipment is required.

Most substantial among those local collaborations is our partnership with Southern Belle Electric and HVAC, LLC, to recruit, train, and manage a new labor pool with expertise in underground and fiber construction.

By awarding Volo Broadband the funding for Internet access *Just Like Water*, the state will bypass the many levels of hand-off between the entity that wins the award and the entity that ultimately does this work. This will shorten the time to deployment and maximize the dollars spent.

10. Web links to any additional information that should be considered

Our GIS network work mapping resources and other supplemental information are available at <http://volo.net/gigchallenge> .

In addition to internet service, Volo broadband provides refurbished computers for six Public Computer Centers, reduced-cost bandwidth to the major PCC at the Urbana Free Library, and affordable refurbished complete computer systems (LCD monitor, keyboard, and mouse for only \$135) through the **Digital Equality Initiative, a partnership between Volo Broadband and Parkland College** established in 2011 to help increase digital literacy in the Champaign-Urbana area. Internet *Just Like Water* will increase the services available for these anchor institutions and partnerships.