M E M O R A N D U M

TO: Council members and Mayor Prussing

FROM: Mike Monson, chief of staff

DATE: March 31, 2009

RE: Broadband grant acceptance

Introduction: This proposed resolution would formally accept the $22,534,776 federal grant. from the National Telecommunications and Information Administration (NTIA) established under the American Recovery and Reinvestment Act, and the $3.5 million grant from the state of Illinois. It would commit the city of Urbana to providing a local match of $345,675. Including other local matches totaling $3.3 million, the total project cost is $29.3 million.

The grant would pay Urbana $273,000 in compensation for the additional demands on city staff overseeing infrastructure construction will require. Urbana Public Works Director William Gray said he intends to hire two inspectors with the funds to oversee fiber and conduit installation on the city right of way.

Additionally, the city has received a commitment it will receive at least $214,000 in grant funding in compensation for fiber the city has already installed linking city, county, school district and park district facilities.

Background: After months of waiting, the local consortium made up of Urbana, Champaign and the University of Illinois, known as UC2B (Urbana-Champaign Big Broadband) , was notified March 2 that it had been awarded a $22.5 million broadband infrastructure grant. The cities and University have until April 9 to accept or reject the grant funding. The Champaign City Council accepted the grant funding in a 7-1 vote on March 16. The UI will accept the grant after the two city councils have done so. Kathy Young, the head of the UI's Office of Sponsored Programs and Research Administration, would accept the grant by signing it.

Two other related grant applications, seeking $1.3 million for Public Computing Centers and $3.7 million in federal funding for Sustainable Broadband Adoption, were rejected by the NTIA. A local group is reapplying for those grants in Round 2 of grant funding, seeking $4.5 million

total. The Urbana council has indicated its willingness to provide up to $210,000 in local match funding, while the Champaign council has not yet committed to providing any funding. It also now appears that the state of Illinois will not commit any funding toward these grants.

The successful infrastructure grant is composed of two key elements. The network backbone would link 137 critical institutions, including schools, hospitals, city buildings and libraries via seven fiber optic rings. The project also includes a fiber-to-the- home component, offering broadband service to 4,650 homes in 11 census blocks in the two cities for $19.99 per month. It is estimated that 2,500 households would opt to subscribe to the Internet service.

The seven fiber rings will have 495 points of connection within 500 feet of 12,000 households and 800 businesses, which could allow for future expansion. The project would not pay for connecting these homes and businesses, but they could opt to connect at a cost estimated at about $3,000 per connection.

Construction is expected to begin in earnest in 2011 and possibly extending into early 2012, according to Michael Smeltzer, director of networking at Campus Information Technologies and Educational Services at the UI.

 A project of this scope raises a number of questions and issues, some of which will have to be sorted out over time by the UC2B consortium Policy Committee, a seven-member board that will consist of two appointees each from Urbana, Champaign, the UI and also the chair of the consortium's technical committee as the seventh member. The three bodies will also make appointments to the 12-member technical committee, which will advise the policy committee on technology issues. Six of the 12 technical committee members would have voting power; the other six would be advisory.

Key issues include:

Financial sustainability: The biggest concern regarding financial sustainability is the fiber-to-the-home portion of the project. The grant application assumed a 54 percent penetration rate and showed the project having positive cash flow through six years.

Our consultant, Doug Dawson of CCG Consulting, assumed a lower penetration rate of 40 percent and projected a $259,000 cash flow deficit after five years and a $3 million deficit after 10 years, with a significant portion of that deficit being the cost of replacing the backbone's electronics for fiber-to-the-home delivery. The lower the penetration rate actually is, the higher the projected deficit would be, according to Dawson.

It should be noted that current penetration rate for broadband in the 11 census blocks is only about 40 percent overall. Furthermore, the Sustainable Broadband Adoption grant application, which would have helped train residents in underserved areas how to use broadband and likely boosted our penetration rate, was rejected by NTIA. As stated earlier in this memo, a second round grant application for Sustainable Broadband Adoption has now been submitted, but the state has declined to fund it and Champaign also has made no financial commitment.

Dawson suggested four ways that any future deficit could be mitigated and Smeltzer has endorsed them all. They include:

- The contributing agencies could pay a higher maintenance fee than what is called for now. For example, maintenance revenue from agencies is estimated at $145,000 annually (for right of use of the fiber). Dawson suggested that the cities might want to contribute their current actual costs, instead of the lower amounts called for in the project budget, to improve the balance sheet
- Selling broadband services to the roughly 800 businesses located near the fiber rings.
- Selling fiber strands to larger businesses, such as Carle, Provena or Busey Bank, which would pay a substantial initial upfront fee and also an annual maintenance fees.
- Selling wholesale access to the network to other Internet service providers, who would pay a per-subscriber fee to the consortium for providing internet and/or phone and cable television services to customers.

Other financial challenges: Not obtaining the Sustainable Broadband Adoption grant, at least not yet, presents another problem. That's because that grant funds were going to initially fund a community help desk to answer questions from broadband subscribers.

The project does call for 16 percent of all subscription income from broadband subscribers to go toward customer care, or $3.20 for every $19.99 per month subscriber. By the fourth year, projections are that this will raise $240,000 annually and help pay for help-desk support. In the initial years, the consortium might want to subcontract with Champaign Telephone Company or Pavlov Media to provide help-desk support at a lower cost, according to Smeltzer.

Longer term, the biggest financial challenge for the consortium will likely be raising the money from operations to pay for the electronics replacement for fiber-to-the-home delivery, which will likely be required by year eight. Replacement could cost $2 million or more. Realistically, the cities and UI might have to consider including funding for electronics replacement in their long-term capital improvement plans if operations don't generate enough income.

 Yet another challenge is how to pay for salespeople to sign up customers in the 11 census blocks. Smeltzer told Urbana department heads in a March 12 meeting that the grant allows for spending $1,750 per household to bring fiber to the curb (and another $1,500 to bring fiber from the curb to the home), and that there likely could be money pulled from the fiber to the curb funding used to pay for signing up residents for broadband service.

It also remains unclear whether the consortium can afford to hook up new subscribers in the 11 census blocks once the grant period runs out in February 2013 and the cost of customer installation is no longer covered by the federal grant.

As for how future consortium deficits might be covered and whether any deficits would be split three ways, or just between the two cities, Smeltzer said: "There is nothing in the IGA (intergovernmental agreement) that obligates either city or the university to contribute a dime to future operations. In fact, I think that financial decisions (of the policy committee) need to be

unanimous, which effectively gives each entity veto power over any financial requests of the members of the consortium."

Pull the plug?: Should the fiber-to-the-home portion of the project prove to be a big financial drain to the cities, a more drastic option would be to back out of the residential broadband business, either by letting the residential portion of the network go dark or selling the customer accounts to a private vendor who would operate the FTTH system.

Dawson said in his report to the cities that the grant rules require that the consortium must provide low-cost bandwidth to customers through at least the first three years of the project. Grant rules also appear to prohibit selling the network without federal approval, he said. But Dawson said he doesn't see any prohibition against selling the residential customer accounts to a private business, or going dark. Smeltzer has an identical interpretation of the federal rules.

Electronics: Network electronics were probably the area of greatest disagreement between our broadband consultant, Doug Dawson, and the UI's Smeltzer. The UI has suggested in its application that it would like to use new WDM-PON electronics, which have not yet been deployed for fiber to the home anywhere in the United States except on a small-scale test basis. WDM-PON electronics have been widely used in South Korea, where about 150,000 customers are served by the technology.

LG, a South Korean company, sells WDM-PON, in partnership with Nortel. However, Nortel is in the process of selling its share.

Smeltzer said that UI officials promised the NTIA that they would be able to provide a minimum of 100 megabits per second symmetrical (upload and download) broadband service, and that only WDM-PON or active Ethernet could provide that level of performance.

Dawson responds that a slightly older form of electronics, called GPON, delivers 100 megabit symmetrical and that the technology should not be excluded on that basis. Smeltzer agrees that new variants of GPON do provide higher performance levels, but that these variants are "not the time-tested GPON that Verizon is deploying" and would have to be considered new technology, like WDM-PON.

Dawson said his biggest concern with WDM-PON is that in South Korea, broadband networks are very standardized and the electronics work "with only one or two brands of routers" there. In contrast, there is much more diversity of equipment in the United States that the FTTH electronics would have to work with, he said.

By being the first U.S. fiber-to-the-home network to use WDM-PON, Dawson said he fears that "you'll be the first to solve all of Korea's problems," that customer service will suffer and UC2B will get a bad reputation and fail to attract and retain customers. Dawson said WDM-PON probably would work well with the data network envisioned for UC2B, but he predicted problems would arise if an outside Internet service provider was granted access to the open network and also wanted to offer telephone and cable television service.

Smeltzer said the UI team likes WDM-PON because, "it combines the best features of active Ethernet with the best features of GPON."

WDM-PON also can transmit over greater distances than GPON, which will eliminate the need for any pedestals or huts needed to deliver service to the fiber-to-the-home area.

Obviously there is a disagreement here that would need to be explored in depth by the technical and policy committees of the consortium.

Fortunately, both sides appear to see a common solution: a fair request for proposals process that would look at a variety of factors and weigh them thoughtfully before deciding on an electronics technology choice. "No technology is being ruled out at this time," said Smeltzer.

Conduit design: The UC2B conduit design, with seven rings, has also drawn some criticism as being overdesigned. Dawson said "no commercial network would ever be designed that way" and that the technical committee might want to look at a leaner design with fewer rings as a way to reduce costs and possibly pay for added features not now in the design. But given that the federal government will be paying for the network, and that having so many rings brings fiber close to hundreds of businesses and thousands of residents, the current design has its advantages, he said.

Ultimately, the choice is between saving money or getting to as many places as possible, and that choice must be made by the policy committee, Dawson said.

Peter Folk, owner of Volo Broadband, has been the most vociferous local critic of the conduit design, arguing that a simple one-ring design could be done for several million dollars less that would work just as well. Folk has publicly called for a request for proposals for the network's design to be issued.

"Why can't we have a public process?" Folk said. "You wouldn't buy something this big without a public RFP."

Folk also argues that the current conduit design makes it nearly impossible for the network to be run without the University of Illinois' involvement, and a design more independent of the UI would benefit the cities in the long run.

In a recent e-mail to Mayor Prussing, Smeltzer strongly defended the design, saying it was largely based on getting as close as possible to the 137 critical institutions. He also noted that the NTIA had agreed to fund the project based on the tentative design, meaning they found the design acceptable.

Smeltzer did say he wanted Folk to have a chance to make his case to the Technical Committee.

"There may be others in the community that have different ideas of where the conduits should go, and I want everyone to have a chance to have their say and make their cases," Smeltzer wrote

in a March 24 e-mail. "At the end of the day, I trust the Technical Committee to choose a design that they can support, and to recommend that design to the Policy Committee for approval."

This issue will come up almost immediately, as the conduit design must be settled by the Policy Committee before a detailed environmental assessment can begin. The consortium won't receive grant money for construction until after the environmental assessment is done, and the NTIA has set a July 1 deadline for completion of the assessment. That means the conduit design should be decided by about April 30, Smeltzer said.

Node location: Also, on the issue of design, Dawson believes that the consortium might not want to locate both network nodes on the UI campus, that one of the two nodes possibly should be located elsewhere, on either Urbana or Champaign city property. A node can be housed in a room the size of a bedroom, he noted.

Without getting into too much detail, a node in our type of network would serve several purposes, according to Dawson. They include:

- A point of interconnection with the outside world, where, for example, we would connect to the open Internet and to any other carrier that is going to be connected to the network. The node would have electronics that would allow access and egress to the network.
- A node is often a place where co-located equipment is housed. For example, a cable or phone provider might have a rack of equipment at the node to make connections they need.
- A node generally is where the fiber breaks off from the backbone rings and heads toward customers.

Dawson recommends having one node off the UI campus for the following reasons:

"In a network like this, it would seem to be sensible to have one node on the campus and another (or eventually many others) somewhere else," he wrote in an e-mail to the city. "Clearly, the UI is one of the bigger users of the network and also where the Internet backbone connection comes from, so a node there makes perfect sense.

"But having a node elsewhere would be a more natural thing for outside carriers (Internet service providers, cell-phone companies, long-distance telephone companies). Carriers are first always a bit nervous about access and security measures at government locations – a neutral hut location would be more what they are used to. In the long run, if there ever came a day when the network might be sold, then a buyer is going to be very leery about buying a network that only has connections on a state-owned property. In thinking very long-term, having a node outside the campus is a hedge against the day when the cities might see financial benefit to selling the network," he wrote.

Smeltzer points out that if the nodes are to connect to both the Urbana and Champaign rings, the nodes need to be in the middle of everything "and that equates to campus."

"Every time we add a remote aggregation point, we have created another location that needs a back-up generator, electrical service and cooling," Smeltzer said in a March 24 e-mail. "The more locations we have to support, the higher our operating costs will be."

General manager: Dawson and Smeltzer both agree that hiring a general manager to run the fiber to the home Internet business, and who would report directly to the policy committee, is a top priority. The general manager should be hired four or five months before the first customers begin receiving service and he or she should be charged with making the business profitable, according to Dawson.

The general manager can and should play a major role in knocking on doors and signing customers up for broadband service during the early stages, he added.

Alternatives:

1. Accept the federal offer of funding from the federal and state governments as one of the agencies that make up UC2B.

2. Reject the offer of federal and state funding.

Advantages to accepting grant:
- Would make Urbana-Champaign competitive in attracting high-tech companies needing redundant and fast Internet connections.
- Would provide underserved residents in the 11 census blocks, including five in Urbana, with low-cost, high-speed Internet service.
- Would install a network backbone that would easily be able to serve businesses and residents willing to pay roughly $3,000 to connect to a fiber ring, and would serve 137 critical institutions from the start. Larger companies wanting dedicated fiber would have to pay substantially more.
- Leverages $22.5 million in federal funding and $3.5 million in state funding with a local contribution of just $3.3 million. Urbana's share is $345,000.
- Would create 90 construction jobs for one year.
- Would provide an excellent starting point for municipal broadband. Consortium would get a taste of what operating a municipal Internet service provider business is like.

Disadvantages to accepting grant:

- There are real questions about whether the fiber-to-the-home portion of the project can pay for itself, particularly the electronics replacement necessary in year eight estimated to cost at least $2 million.
- Urbana has already done an excellent job in connecting city, school district, park district and county facilities with fiber, having already hooked up 25 governmental facilities. Information Services Manager Bill DeJarnette estimates that he could connect all of the Urbana critical institutions that the grant would serve (another 19 or so locations) with

fiber for about $600,000. Only five governmental sites in Urbana remain to be connected, according to DeJarnette.

- Loss of independence. Urbana would have to work in partnership with the city of Champaign and the University of Illinois as part of the UC2B consortium. City officials could be outvoted on the direction of the consortium, and withdrawal from the consortium or dissolution would undoubtedly be a painful process.

Fiscal impact: The money for the city's $345,000 match would come from the city's TIF 3 fund, which is well-funded and can afford the expenditure.

The city would receive $273,000 in direct and indirect compensation from the grant, which Public Works Director William Gray intends to use to pay for hiring two inspectors to oversee right-of-way conduit construction.

The city also has received assurances from Smeltzer that it would receive grant compensation for the $214,000 the city has already spent to date installing fiber. Champaign would receive compensation for its more limited fiber installation as well. The exact formula for how this expense will be paid out has not been finalized, but there appears to be agreement among the three consortium partners to move forward on this.

The most immediate challenge will be to make the fiber-to-the-home portion of the project profitable and to connect as many businesses near the seven fiber rings as possible to improve profitability.

Recommendation: Although it requires taking an admitted leap of faith, the opportunity presented by the federal infrastructure grant is a significant one. High-speed broadband is fast becoming a necessity for many businesses and the broadband network envisioned will set the community up well for economic development success, connecting another 25 or so critical institutions and making it easy and relatively cheap for many businesses to connect to the network.

Making the network profitable will be a considerable challenge for the three consortium partners, but, at worst, even if the fiber-to-the-home network fails, it appears that UC2B can reduce its scope and still have a successful, sustainable network for local governments and businesses. Additionally, serving the 11 census blocks will provide the cities with valuable experience should the city councils eventually decide they want to build a municipal broadband network that serves Urbana and Champaign.

The mayor and staff recommends passage of the resolution accepting the federal grant.

RESOLUTION NO. 2010-03-005R

**A RESOLUTION AUTHORIZING THE MAYOR TO EXECUTE
AN AGREEMENT WITH THE U.S. GOVERNMENT FOR THE
ACCEPTANCE AND UTILIZATION OF GRANT FUNDS
(UC2B Big Broadband Project)**

WHEREAS, the City of Urbana has a population of more than 25,000 and is, therefore, a home rule unit under subsection (a) of Section 6 of Article VII of the Illinois Constitution of 1970 and 65 ILCS 5/1-1-10; and

WHEREAS, the American Recovery and Reinvestment Act provides for the granting of certain monies to chosen communities for the creation of a broadband infrastructure to expand broadband usage into un-served and underserved neighborhoods; and

WHEREAS, the City of Urbana, the City of Champaign, and the University of Illinois have formed, through an executed intergovernmental agreement, a consortium to apply for said grant monies and to construct said broadband infrastructure for the use and enjoyment of their un-served/underserved populations; their business and technology communities; and their educational institutions; and

WHEREAS, the City of Urbana desires to become a benchmark community in providing high-speed, broadband capacity to all of its citizenry, businesses, governmental partners, and schools, so that those entities may take advantage of advanced or cutting-edge computing, learning, and communication tools and technology; and

WHEREAS, the State of Illinois is providing certain grant matching funds to assist the communities in meeting their financial commitment to the broadband project; and

WHEREAS, the consortium partners have all agreed that each partner will receive credit for any fiber optic infrastructure it has already installed;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF URBANA, ILLINOIS, as follows:

Section 1.   That the City of Urbana will accept, with its consortium partners, grant monies for the construction and

implementation of broadband infrastructure (the Big Broadband project), and in doing so, the City will work closely with the other consortium members to do the following:

A. Study, and if appropriate, adopt the financial recommendations from Doug Dawson/CCG Consulting and other experts to create a sustainable, ongoing network operation that is financially self-sustaining;
B. Devise a fair financial accounting process that will compensate each consortium partner for the fiber optic infrastructure that it has already installed;
C. Use an RFP process, vetted by consortium members, to procure conduit design, engineering and electronics. The conduit design should place one of the nodes off campus in Urbana;
D. Pursue the application for the Google Fiber project in order to complement the network backbone and to expand residential and business access to the broadband network.
E. Broaden the charter of the UC2B intergovernmental body to assure that the consortium is chartered to meet the networking goals of the community.

Section 2. That the Mayor of the City of Urbana, Illinois, be and the same is, hereby authorized to execute and deliver any and all Agreements between the City and the U.S. Government for the UC2B Big Broadband project, and the City Clerk of the City of Urbana, Illinois, be, and the same is, hereby authorized to attest to said execution of said Agreement, as so authorized and approved for and on behalf of the City of Urbana, Illinois.

Section 3. That the Mayor, or her designee, is authorized to take such actions as are required of the City under the Agreement(s).

PASSED by the City Council this _____ day of _____, _____.

    AYES:

    NAYS:

    ABSTAINS:

    _____
    Phyllis D. Clark, City Clerk

APPROVED   by   the   Mayor   this   _____   day   of

_____, _____.

_____

Laurel Lunt Prussing, Mayor