MEMORANDUM

DATE: **May 1, 2011**

TO: **UC2B Policy Committee**

FROM: **Richard Schnuer**

SUBJECT: **Additional UC2B Access Facilities**

I. Introduction

This memorandum discusses including provision for two additional access facilities in the initial UC2B construction project, one controlled by the City of Champaign and the other controlled by the City of Urbana.

II. Purpose

Early in the application development for UC2B grant, alternate sites were sought to locate equipment that would help support the fiber optic network. There was even a budget allocation in the proposed budget to build a communication hut in Champaign to be able to support the various technologies and for fiber distribution in the Fiber To The Premises (FTTP) areas. It is extremely important to have access facilities in each of the communities for the following reasons:

- The network is to be open, which allows other retail service providers to attach to it and use it (at some mutually agreed to annual cost).
- Multiple nodes would provide retail service providers the ability to create their own system resiliency.
- Having a couple locations outside University premises offers vendors locations that might be more easily accessed than the University.
- Enclosed facilities help reduce the number of visible cabinets that the technology might require in the FTTP areas.
- Having multiple access facilities helps to optimizes future capabilities that might be needed in the network.
- Having access facilities in each city protects the cities from potential UC2B organizational failures to meet its operational and/or financial objectives, particularly in light of the fact that the University's role in UC2B after the completion of construction has not yet been fully defined.
- It is unclear how much expansion capability remains within the University nodes for meeting University, UC2B and retail service provider needs (for UC2B's open access network requirements).

- Huts might be needed (in the initial design) to support the technology chosen for the network (via a competitive process).
- The University was providing the sites for the main network nodes to house the network's electronics. Two nodes were used to create resiliency in the fiber network.

III. Concept

The idea is to create at least one site in each of the cities to build facilities that meet certain industry standards to provide UC2B, the Cities, and retail service providers the space and function they need to access the network (data center for communications and services). While some vendors may already be in the University nodes, the nodes in the cities would provide alternate sites for such locations and may provide vendors a more cost effective alternative for reaching and being part of UC2B's network. These nodes may also attract new vendors not currently in the University node locations.

IV. Background

There are a couple nationally known organizations that establish criteria for building data centers. These are the TIA (Telecommunications Industry Association) and BICSI (Building Industry Consulting Service International). Each association provides a tiered approach with additional standards that must be met at each successive level. Attachment A is a high level overview provided by TIA (TIA-942 - Data Center Standards Overview) that address the standards needed for each level. Each successive level adds certain capabilities and the associated standards for meeting those capabilities.

Generally, the cost to build a Tier I data center is $150.00 pre square foot and provides about 99.671% availability (or 28.8 hours down time per year). However, a Tier I data center provides only the basic data center requirements and lacks any real resiliency. Tier II data centers offer a bit more redundancy and would cost about $225 per square foot to build. Tier II centers provide about 99.741% availability (or 22 hours of down time per year). Many vendors may still not find Tier II accommodations to be adequate. Tier III data centers cost about $300 per square foot to build and offer about 99.982% availability (or 1.6 hours down time per year). Tier III is more what vendors might expect in a data center and in reliability in serving its customers. Finally, Tier IV provides the highest level of resiliency in the construction standards for data centers. Tier IV data centers cost about $450 per square foot and offers 99.995% availability (or .4 hours per year down time).

IV. Cost Estimates

Champaign - City of Champaign Building (Public Works facility located at 713 Edgebrook Drive)

The parking building has sufficient space to create a facility of 500-800 square feet that meets data center requirements with some potential for future growth. The facility has securable access and is located next to a handhole just outside the facility that could have access to a couple fiber rings (#1 and #2). The facility can also be used to house the necessary electronics and cables to connect to the fiber rings and to provide connections for FTTP. Additional square footage is available in this building, but the recommended space strikes a balance between meeting functional needs and budgetary limitations. The Policy Committee and City of Champaign would enter into an agreement regarding facility use and ongoing maintenance. The City will likely want its network equipment to co-locate in this facility, but will need to be physically isolated from UC2B's equipment and cables management with the exception of the City's connections to UC2B and the fiber it owns as part of an IRU. Two options are considered for cost estimates to remodel the facility and they are provided below:

For Tier I Standards (Estimated)

Square Feet	Demolition	Engineering	Tier I Cost	20% Contingency	Total
500 Sq. Ft.	$20,000	$25,000	$75,000	$15,000	$135,000
800 Sq. Ft.	$32,000	$25,000	$120,000	$24,000	$201,000

For Tier III Standards (Estimated)

Square Feet	Demolition	Engineering	Tier III Cost	20% Contingency	Total
500 Sq. Ft.	$20,000	$25,000	$150,000	$30,000	$225,000
800 Sq. Ft.	$32,000	$25,000	$240,000	$48,000	$345,000

Urbana - ILEAS Facility

Costs have not yet been developed for the ILEAS facility. It is already constructed to handle a certain level of the Tier III requirements, but will require site modifications and equipment. It is hoped that using this facility will help keep costs reasonable while providing the necessary components to bring the facility to a Tier III standards. One drawback to the ILEAS facility is that it is not owned by any of the parties in the UC2B agreement (University of Illinois, Cities of Urbana and Champaign). However, UC2B, Urbana, and Champaign County would enter into agreements regarding rights and obligations of the various parties.

V. Proposed Policy Board Motion Regarding Additional Network Nodes

1. That the UC2B Policy Committee directs the University to:
   - Revise the Shive contract to include preparation of preliminary design and estimates of total costs for the work necessary to include construction of two Tier III network nodes as described in the addendum "Description of Additional Network Nodes" as change orders in the Shive contract and in the initial UC2B network construction contract.
   - Develop alternatives to revise the UC2B budget to allocate sufficient funds for such costs as necessary (including engineering, construction, and any other necessary costs) to include additional network nodes in the two cities.
   - Complete the work above and transmit a memorandum summarizing the preliminary design work and its funding recommendations to the Policy Committee in sufficient time for the Policy Committee to discuss this matter at a meeting preceding the planned award of the construction contract by the Policy Committee.

2. That the UC2B Policy Board directs the University to allocate such funds to revise the Shive contract to prepare the preliminary design and cost estimates described in Section 1 above.

Addendum to Proposed Policy Board Motion Regarding Additional Network Nodes

Description of Additional Network Nodes:

Urbana – Create a protected data center in the ILEAS facility for use by UC2B and potential retail service providers for access to UC2B Fiber Network. The ILEAS facility is already constructed to handle a certain level of the Tier III requirements, but will need site modifications and equipped to make this facility complete. It is hoped that using this facility will help keep costs reasonable while providing the necessary to bring the facility to a Tier III standards.

Champaign – Create a protected data center in the City of Champaign's Parking Building to create a Tier III data center for use by UC2B and potential retail services providers for access to the UC2B Fiber Network. The City may share in some of the cost for a secured area within the data center for its equipment and access to UC2B and City fibers.