

## **Broadband Summary & Relevance to Economic Development**

### Broadband Demand Overview

The need for broadband connectivity is increasing across many business and industry sectors. Given the amount of internet content, data processing demands, internet commerce and data storage/backup systems that are a part of nearly every commercial entity, businesses of any size will see productivity benefits as a result of increased connectivity speeds. It is estimated that the demand for expanded bandwidth will increase ten-fold by 2015, while mobile data traffic will double each year for the next five years. The existing fiber infrastructure in the City represents a competitive advantage over other regional communities of similar size. However, not all businesses and/or properties are connected to the existing network.

### Current Situation

An August 2011 survey found that businesses are currently using a wide variety of internet platforms, with speeds ranging from 10 Mbps to 100 Mbps. Virtually every business reported an anticipated increase in demand over the next five years, with 100-500% growth reported. Most businesses are satisfied with their current provider, although some are unable to expand service as desired based on the initial cost of this service expansion.

### How can Connectivity Drive Value?

For many businesses, broadband is an essential component of their operations and only locations which can provide this amenity will be options. The pool of companies who fall under this umbrella is increasing each year as businesses move to VOIP (voice over internet) phone systems, cloud storage and other data-intensive business tools. There is also a demonstrated benefit for existing businesses. A study of rural internet usage identified a .25 percent per year increase in employment for every percentage point increase in broadband use – for Waterloo, this equates to 10 new jobs if 13 additional households are connected to broadband(Crandall, Lehr & Lita).

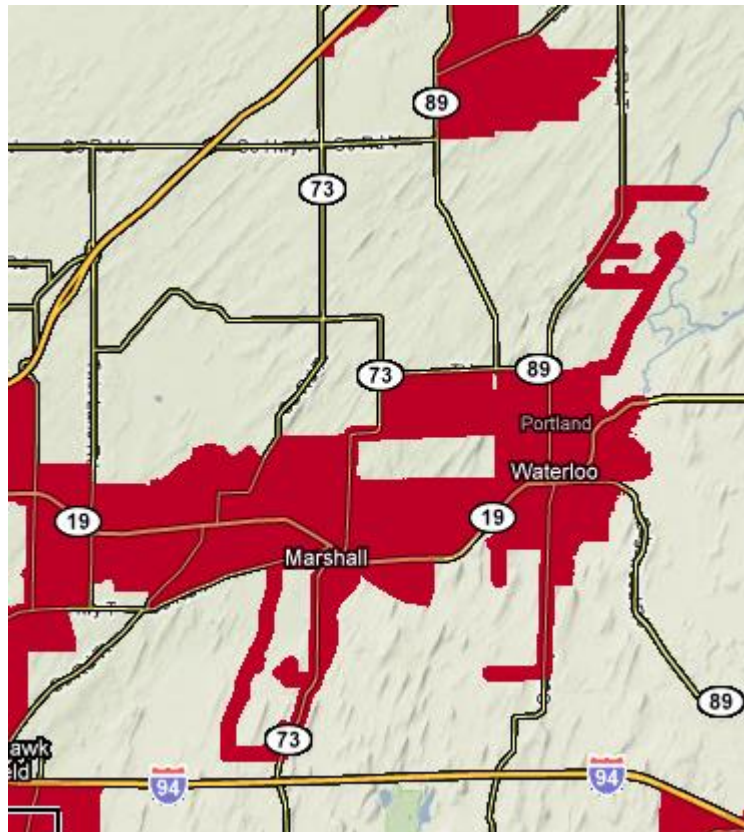
### How can the City capitalize on this amenity?

By offsetting the initial cost of connecting to the in place fiber network, the City can help qualified businesses tap into the system and create or expand jobs within Waterloo. As not all spaces are equally suited for these types of industries, this program is best designed as a matching grant based on new employment or private investment within the City. The program should offset the cost of the initial installation and connection cost, which creates a permanent improvement which will remain with the property. Businesses that use the incentive to create jobs can have the loan forgiven after a suitable period of time. An additional benefit of creating an established incentive program utilizing fiber is the ability of other groups such as property owners and brokers to utilize the program as a marketing tool.

### Background & Current Situation

Waterloo is connected to a variety of existing data networks including copper (Frontier), fiber (Charter), mobile broadband and satellite coverage. Depending on the type of network, connectivity speeds in the City range from 3 mpbs to 100 mpbs. On the mobile broadband front, US Cellular and Verizon provide the highest level of data service, while AT&T and Sprint have more limited data coverage. Satellite providers include the City within their Milwaukee market, limiting the use of these services by area residents. For wired data service, Frontier has a copper network which extends through a majority of the City and provides up to 12 mpbs of service. Charter operates a fiber network with increased connectivity which varies by location within the community. The map below illustrates the areas within the City currently served by Cable providers.

### Cable Modem Coverage (includes copper, fiber and cable)



- | Recorded Providers Serving Waterloo |
|-------------------------------------|
| US Cellular                         |
| Charter                             |
| Verizon                             |
| Frontier                            |
| AT&T                                |
| Sprint                              |
| HughesNet (Satellite)               |
| WildBlue (Satellite)                |

Source: Link Wisconsin

Each of the above systems provides capacity which is intended to serve particular uses. The table below highlights the amount of bandwidth which is recommended for typical uses to allow convenient access to particular data or activities over broadband networks. The significant increase in Netflix, Hulu and other streaming media channels have increased the demand for service in excess of 10 mpbs on residential networks.

## Recommended Bandwidth Capacity by Usage

Application	Recommended Bandwidth
Mobile voice call	6 kbps to 12 kbps
Text-based e-mail	10 to 20 kbps
Low-quality music stream	28 kbps
Medium-quality music stream	128 kbps
High-quality music stream	300 kbps
Video conferencing	384 kbps to 3 Mbps
Entry-level, high-speed Internet	1 Mbps
Minimum speed for responsive Web browsing	1 Mbps
Internet streaming video	1 to 2 Mbps
Telecommuting	1 to 5 Mbps
Gaming	1 to 10 Mbps
Enterprise applications	1 to 10 Mbps
Standard definition TV	2 Mbps
Distance learning	3 Mbps
Basic, high-speed Internet	5 Mbps
High-Definition TV	7.5 to 9 Mbps
Multimedia Web interaction	10 Mbps
Enhanced, high-speed Internet	10 to 50 Mbps, 100 Mbps emerging

Source: GigaOm

## Waterloo Current Usage and Demand

In order to assess the level of existing demand and potential opportunities, a residential and business connectivity survey was conducted in August of 2011 which identified the following:

- **Residential Usage and Demand:** Just under one quarter of residents responding to the survey have internet service which provides speeds of 8 mbps or greater. However, approximately half of respondents reported using the internet for high-demand activities such as streaming movies, file transfer and working from home. Current residents expressed the greatest dissatisfaction with the reliability of Charter service, and the inability to select alternate providers for high speed service given that satellite providers do not offer Madison stations to Waterloo residents.
- **Business Usage and Demand:** Small business users (retail and service establishments) were satisfied with current service, which typically included cable or DSL service with a local server for system backup. Service was reportedly reliable and anticipated future growth was within the capacity of existing providers to handle. Large businesses (manufacturing, medical and schools) reported significantly more demand for connectivity. Many businesses had recently upgraded service or were planning to do so in the next year. Typical service speeds for this group ranged from 20 mpbs to 100 mpbs over largely fiber-based service, with most businesses anticipating a five-fold increase in demand over the next five years. Firms also reported a desire to address data storage and backup issues, including cloud storage, outsourced data center activities, etc.

## Prospective Businesses

While existing businesses demand growth is a relevant element in the long-term connectivity plan, the majority of existing businesses are connected to a cable network and happy with their provider. To

determine if a program which provided fiber service hookups to existing buildings would represent a competitive advantage in recruiting new companies, stakeholder outreach was conducted with individuals responsible for handling leasing or IT needs for small internet-based businesses with high connectivity requirements (graphic design, website services, gaming design, etc) to determine if fiber optic connectivity would be a saleable feature and influence site selection. Based on these discussions it was determined that:

- Existing fiber optic service to small spaces (1,500 to 3,000 SF) is in fairly limited supply,
- The presence or limited-cost immediate availability of fiber optic service in a community could be a fairly strong draw, and
- The most effective means of conveying this message to receptive parties was by marketing an established program together with available space opportunities in locations where tech-savvy companies would be seeking space.

### **Pricing**

Reliable pricing information is difficult to obtain given the proprietary nature of fiber networks and various corporate writeoffs available within broadband companies based on anticipated subscriber levels. However, stakeholders interviewed were asked about the typical cost to install fiber service into a new space which was not currently served (but was in a community with a fiber network). The average cost for this expansion was reported to be \$3,000 to \$4,000 per space. As an existing fiber network has been confirmed near the downtown area and Hwy 19 corridor, these prices are likely comparable to the installation cost within these areas of town. Further research will be required to determine what costs may be required for installation of fiber networks into additional areas such as the business park.

### **Conclusion & Recommendation**

The existing broadband and fiber amenities are an attractive amenity from the perspective of many business types. This demand will increase over the coming five years as internet and data processing/storage demands increase for a variety of industries and residents. In the short term, expanding the use of the existing network can help improve productivity of existing businesses and create greater utilization of currently vacant real estate. Programs which make it cost effective to connect to this existing network will increase the value of spaces and provide a marketing tool for the City and property owners to convey the value of this amenity to prospects. A profile of what this program could look like is provided on the following pages. Over the longer-term, creating more customers in the community will increase the ability to partner with broadband providers to expand the network to better serve additional expansion corridors, such as the business park.

Other secondary or future initiatives could also include partnerships with mobile data providers to increase the 3 and 4G services provided within the community, address the ability to provide satellite coverage affiliated with the Madison market and utilize grant or other funding to offset the cost of linking more City households to existing networks to increase the marketability of City residential properties.

### Connectivity Incentive Program Overview

The connectivity program is intended to assist with the up-front cost of wiring a commercial space and extending the connection between existing fiber optic lines in the community and individual buildings/spaces/sites. The program is intended for businesses which can demonstrate a need for fiber capacity, based on business plan or presence of fiber at their present place of business. In return for this assistance, businesses will create one job per \$1,000 in loan funds. If the jobs remain for the three-year startup period, the loan is forgiven. The table below highlights the potential costs and benefits of this program for both the City and prospective business.

**Program Overview:** The City of Waterloo would agree to cover the initial cost of connecting buildings within the TID 2 district to the fiber line (up to \$5,000). In return, tenant agrees to sign a minimum of a three year lease (or purchase) space in the district and to employ a minimum of three full-time equivalent positions in the district, or one job per \$1,000 in City expenditure). Tenants would also be eligible for any future tenant improvement matching funds under the annual property improvement program to pay for interior cabling and space buildout.

### Program Costs/Benefits

**Anticipated Costs:** Total anticipated costs associated with the program depend upon the number of new companies which can be attracted. In TID 2, there are currently approximately 25,000 square feet of vacant space, not all of which is being actively marketed. Several of these spaces will likely be occupied by retail or restaurant tenants, which would have limited need for broadband connectivity. However, if two-thirds of the space were ultimately home to office or service businesses, this could create 50-60 jobs in Waterloo. With a cap of \$5,000 per space, the total multi-year cost of the program would not exceed \$40,000, contingent upon jobs remaining in the community.

In addition to the repayment provision for jobs which are not retained, the program would create lasting benefits by creating a fiber link to a space, which would not require additional funds for subsequent tenants. Additionally, many companies which would be suitable for these spaces are principal-owned entities, increasing the likelihood that some or all of the employees would reside within the community.

**Tenant Benefits:** For a tenant considering a 1,500 square foot commercial space in the downtown area, the following table represents the cost typically associated with a relocation and space buildout and illustrates the potential cost savings resulting from selecting a location in Waterloo's TID 2 district and utilizing the Connectivity Incentive. In sum, programs available in Waterloo would make the cost of starting a business 18% cheaper than other locations requiring a similar level of buildout.

Cost Item	Typical Cost for 1,500 SF
Fiber Connection	\$3,500
Move Cost (\$2.00 per SF)	\$3,000

Includes cost of moving, hookup fees, phone routing, etc	
<b>Space Buildout (\$25 per SF)</b>	<b>\$37,500</b>
Includes paint, carpet, cabling, lighting, fixtures, offices/cubicle buildout, furnishings and assumes significant reuse of existing equipment	
<b>Total Move Cost</b>	<b>\$43,500</b>
<b>Benefit Item</b>	<b>Potential Incentive Benefit</b>
<b>Fiber Connection</b>	<b>\$3,000</b>
<b>Tenant Improvement Match</b>	<b>\$5,000</b>
<b>Percent Savings in Waterloo</b>	<b>18%</b>