

Potential Value of Mesh Network Services

Currently the only alternative to a mesh network for the City would be to purchase a data service from one of the major wireless carriers (Sprint, AT&T, Verizon, etc.). All of the data rates for these carriers are about the same (State of Wisconsin rates), with unlimited data service costing approximately \$50.00/month per account. This data service would provide bandwidth of 1.5 Mbps optimally, with actual throughput probably being lower. Throughput rates would be determined largely on the proximity to a cell tower and the number of people using the cell tower at any given time. Some of the applications that would be supported using the mesh network may not be usable with the carrier network due to insufficient bandwidth.

The MadCity Broadband (MCB) mesh network would provide free unlimited access to the City of Madison as defined in the terms of the contract. (*The City shall be provided unlimited service accounts with MCB or other ISP satisfactory to the City at no charge, for use by agents and employees of the City in connection with public safety, infrastructure, public works, neighborhood services and similar municipal activities.*) The mesh network would provide bandwidth of 1.5 Mbps minimally and could provide higher throughput, depending on the proximity to an access point and the number of people using an access point at any given time.

Following is an estimate of the number of user accounts that the City might need and a partial list of the potential applications that could be supported by the mesh network. An estimate of the annual financial savings that could be realized by the City, if MCB mesh services were used instead of a wireless carrier, is included. This number is highlighted in **red** and was arrived at by multiplying the \$50 monthly rate (charged by wireless carriers) by the number of proposed users and then multiplying that number by 12 (months).

160 Metro Vehicles **\$96,000**

- Real-time bus location that could allow citizens to sign-up for electronic notification of bus arrivals.
- Provide riders with the ability to "ride and surf" (surf the Internet while riding the bus).
- Install informational screens on the buses that could also be used to sell location-based advertisements.

211 Police Vehicles **\$126,600**

- Live access to the MPD Records Management system.
- Live access to security cameras.
- Police vehicles could be strategically positioned around an incident and provide pictures to command staff either on location or at a command post.
- GPS-like vehicle location could streamline dispatching.
- Possible IP-based wireless telephones

45 Fire Vehicles **\$27,000**

- Ambulances could stream vital sign information and possibly pictures to hospital emergency rooms while transporting patients.
- Fire vehicles could be strategically positioned around an incident and provide pictures to command staff either on location or at a command post.
- GPS-like vehicle location could streamline dispatching.

200 Public Works Vehicles **\$120,000**

- Real-time location of snowplows and refuse collection vehicles would facilitate more efficient routing of vehicles.

300 Field Workers (Water Utility, Health Dept, Fire Dept., BI, Engineering, Assessor) **\$180,000**

- Real-time access to the Land and Asset Management system (ELAM)
 - Work order access without going to a central office
 - Live entry of inspection forms
- Access to maps

Total annual savings: **\$549,000**

The City is in the process of applying for some federal ARRA stimulus money with Madison Metropolitan School District, UW-Madison, Dane County, and MadCity BroadBand that would provide for a 70-mile fiber optic loop. This fiber optic loop would connect all of the MMSD schools all Madison Public libraries, some UW and Dane County facilities and nearly all city-owned facilities. The loop would be largely pole-to-pole using mostly MG&E poles, but some city infrastructure will be used. Following is an estimate of the city-owned facilities that will be needed and their approximate value.

Number	Facility	Annual Cost	Total
3	3 Water Towers	\$22,000	\$66,000
1	1 Radio Tower	\$22,000	\$22,000
4	4 Buildings	\$22,000	\$88,000
450	450 City Poles	\$250	\$112,500
10	Miles of conduit	\$4.00/lineal foot	\$211,200
Annual Value of city-owned facilities			\$499,700.00