NEW BUSINESS
Agenda Item No. : _____
CC Mtg.: 11/8/05

DATE: August 18, 2005

TO: Mayor and City Council

FROM: Joseph W. Luchi, Economic Development Coordinator

SUBJECT: PRESENTATION REGARDING FEASIBILITY STUDY FOR WIRELESS COMMUNICATION NETWORK IN THE CITY OF FOLSOM AND DIRECTION TO STAFF TO PROCEED WITH A WIMAX PILOT PROGRAM

BACKGROUND/ISSUE

Wireless Fidelity (WiFi) communication has become a growing segment of the communication industry as internet service providers and equipment manufacturers have responded to user demand for inexpensive, reliable and mobile access to the internet. WiFi Hotspots, where users, particularly business persons, can access the internet without a direct wired connect, have proliferated. Clearly, the communication industry is moving toward enhancing and promoting WiFi communication networks as the norm for providing service to the internet. Cities and regions which offer WiFi service are positioning themselves to be competitive in developing and attracting businesses. In fact, many communities including Philadelphia, San Francisco, and Sacramento are turning to City-wide WiFi networks as a means to serve the growing demands from residents and businesses for instant mobile communication. The Highway 50 Corridor Study by the Sacramento Regional Research Institute also identified WiFi infrastructure as a potential opportunity that may greatly impact growth and development along and beyond the corridor.

In light of these industry trends and the growing interest in WiFi, the City requested proposals for a technical and financial feasibility study of developing a community-wide, wireless network throughout Folsom that would involve minimal City costs plus would not necessarily compete with private sector interests. A copy of the Statement of Work for the Feasibility Study is attached (Attachment No. 1). The City received proposals from three consultants: Civitium, Azulstar, and Tellus Venture Associates. Based on experience and background, the City selected Tellus Venture Associates, a California-based company. Tellus Venture had recently completed a similar feasibility study for the City of Lompoc in Central California. The City of Folsom co-funded the feasibility study with Intel Corporation (Intel).

Tellus Venture Associates has completed its feasibility study for the City of Folsom and concluded that a wireless broadband system serving the entire City of Folsom is technically and financially feasible. A copy of the feasibility study was previously furnished to City Council under separate cover. For your convenience, a copy of the Executive Summary from the feasibility study is attached (Attachment No. 2). The

consultant recommends proceeding with a pilot program as a proof of concept enabling the City to stake a claim to an unlicensed frequency that will be used by the next generation of WiFi communication entitled "WiMax" or Worldwide Interoperability for Microwave Access. The intent of this effort is not to compete with private-sector interest. Instead, the objective is to create a system that could attract the interest and involvement of the private sector and/or other public sector users.

The consultant is prepared to present at tonight's meeting the key findings from the feasibility study. Following Council consideration of those findings, staff is seeking direction from City Council regarding proceeding with the recommended pilot program.

POLICY/RULE

As the legislative body of a Charter City, the City Council establishes policy and direction regarding all municipal affairs.

ANALYSIS

Several factors provide an opportunity for the City of Folsom to develop the foundation for a community-wide network that will meet the needs of residents and businesses while positioning the City as a leader in the wireless communication industry. The first factor is existing service levels. The results of the feasibility study indicate the entire City of Folsom is well served by existing "wired" Internet Service Providers (ISPs) and a variety of wireless Internet services are already available in Folsom. These conditions are due, in large part, to the high technical sophistication of users in this community. As further evidence of this sophistication and use, radio spectrum surveys indicate that wireless networking technology in Folsom is in heavy use. Meanwhile, recent regulatory rulings by the Federal Communication Commission (FCC) mean that incumbent telephone companies, such as Comcast and SBC, do not have to allow third parties ISPs, like Earthlink and America-On-Line (AOL) to resell Digital Subscriber Line (DSL) service on the telephone companies' infrastructure. As a result, these large well capitalized ISPs will need to find other means to provide service to their customers. This ruling is scheduled to take effect the middle of next year. These factors all lay the groundwork for the City to position itself to take advantage of the next generation of wireless communication, WiMax.

WiMax Standard and Conceptual Design

Since Comcast and SBC are already well-entrenched in providing broadband service in this community, the consultant feels Folsom would be better served by considering the next generation of wireless technology called WiMax. The next generation of mass-produced wireless technology will be based on the WiMax standard. This standard is expected to be approved sometime in the first quarter of next year.

WiMax is capable of operating over longer distances than standard WiFi and can penetrate through stationary objects like buildings and trees. It is also not limited to line-of-sight configurations. Just as importantly, the necessary capital outlays for a WiMax communication system are a tenth of what would be required using current WiFi

technology. The consultant notes that the radio frequencies that will be used for WiMax are generally unoccupied in Folsom. This means the City could stake a "claim" to one of these unused pre-WiMax frequencies. This availability of unlicensed frequencies combined with the fact that the highest point in Sacramento County, Carpenter Hill, is located in Folsom gives this City a unique advantage in creating a WiMax "warm zone" or umbrella that would allow wireless communication throughout the community.

Business Models

Based on the WiMax technology approach, the consultant has developed four business model scenarios. The objective of these scenarios is to meet the needs and interests of early users while ensuring that income covers operating costs by the second year of operations and the initial capital investment can be paid back out of operating surpluses sooner rather than later. The four different business model scenarios are shown below and are described in more detail in the attached Executive Summary as well as the study.

Scenario	Assumptions	Estimated Capital Required ($000)	Years to Positive Cash Flow	Years to Break Even	5-yr IRR	10-yr IRR
Base Business Model	Self-contained	$174	3	7	(15.6%)	21.8%
ISP Partner Scenario	Major ISP is brought in	$128	2	4	46.9%	65.5%
Local Consortium	Joint commercial venture	$106	2	4	28.5%	51.5%
Membership Scenario	Private joint facility	$83	2	6	(4.5%)	16.7%

The first scenario assumes a Folsom-wide wireless broadband system that is fully self-contained enterprise capable of paying the full cost of all necessary resources. The second scenario assumes an established ISP would be brought in as the operating partner. Under this scenario, operating costs would be lower as the ISP could capitalize on economies of scale in terms of assets, brand identity, and customer account management. The third scenario envisions the creation of a local consortium of major institutional users to own, manage, operate, and be served by the system. The final scenario, Membership, is intended to be a privately shared facility by some large users. It would not be offered to the public; but, would be more designed to serve internal institutional needs.

The Base Business Model would eventually pay for itself but with a negative five-year internal rate of return (IRR), it would not justify the risk and investment involved. Risk is reduced in the ISP and Local Consortium scenarios with five-year internal rate of returns of 46.9% and 28.5% respectively. The Membership scenario is not intended as an investment-oriented enterprise. However, with a few large users the costs could be justified simply on the basis of internal need.

Staff is sensitive to creating a system that may compete directly with private-sector interests. It is staff's intent to not compete with the private sector. Rather, staff is interested in promoting the framework of a WiMax system that would either attract private-sector internet provider involvement and participation or serve the focused needs of specific institutional or other users in the community (i.e., City, SMUD, Kaiser Permanente, Mercy Hospital, etc…).

Recommendations and Next Steps

The consultant recommends a series of recommendations or next steps. Those next steps are briefly summarized below:

1. The City should establish a pilot program that stakes a claim on an unlicensed pre-WiMax frequency that allows the City to confirm the proof of concept for a prototype WiMax warm zone.
2. Begin small with a private-public partnership that minimizes cost and risk.
3. Solicit input from local residents, businesses, and institutions at key points of the pilot program to determine if the technology is evolving to meet future needs.
4. Keep existing ISPs aware of the pilot program's progress and encourage them to explore opportunities to participate as partners at some later stage.
5. After the WiMax standard is finalized and the first generation technology can be assessed, a small group of core users or stakeholders should be formed.
6. The core or stakeholder group, with participation from existing ISPs, should determine the initial technical design and business structure of a city-wide, WiMax-based broadband communication system.
7. Once the design and business structure have been established, the WiMax system can be funded and launched on a scale and timeline that best meets the needs of the market.

This approach will allow the City to quickly position itself to take advantage of current opportunities by claiming unused WiMax frequencies and soliciting key partners in getting the system up and running. In addition, by moving quickly with a low-cost pilot program, risks and benefits are minimized. At the appropriate time, this pilot program can be converted into a community-focused enterprise.

On an encouraging note, City staff has held a series of discussions with Intel representative regarding assistance with getting the pilot program operating. Intel has indicated a willingness to provide technical assistance and hardware for the program. The consultant has spoken to other technology providers who have expressed great interest in working with the City in establishing the pilot program. While the details regarding setting up the pilot project would still need to be worked out, these initial positive overtones suggest there is viability to the City's approach.

The consultant also has proposed a timeline for this effort from pilot program to full citywide service. This timeline incorporates a mixture of the individual business models and various scenarios as the pilot program develops and expands over time. While actual

milestones might shift depending on circumstances, staff would use this timeline as overall direction in proceeding with the project.

The consultant anticipates the pilot program parameters will be established before the end of the 2005 with pre-WiMax equipment installed in the first quarter of 2006. In the second quarter of 2006 as WiMax standard equipment becomes more readily available; the core or stakeholder group that would be interested in an eventual citywide system could be formed creating the basis for an enterprise modeled about the local consortium and membership scenarios previously described. By the third quarter of 2006 as the DSL ruling takes effect an existing ISP could be brought in and might be interested in funding and operating a citywide broadband system. Otherwise, the fourth quarter of 2006 would be spent securing funding. Once the funding is secured, Requests-for-Proposals could be issued with full citywide service launched by the third quarter of 2006. It is important to note that cash expenditures are minimized until funding, either from investors or users, are secured.

At this stage, staff is seeking City Council approval to proceed with a pilot program to test the proof of concept merits of such a system. Following a sufficient time to evaluate the pilot program, staff will return to the City Council with recommendations regarding proceeding beyond the pilot project. As mentioned previously, staff is working with Intel and other technology vendors to donate the necessary pre-WiMax equipment and software for the pilot program.

FINANCIAL IMPACT

Costs to the City to implement the pre-WiMax system should be minor consisting primarily of staff time involved in securing access to facilities at Carpenter Hill and consultant time to assist with design and implementation of the pilot project. Estimated consultant costs are expected be below $10,000. These staff and consultant costs can be absorbed within existing budgets. If costs become greater-than-anticipated, staff will return to the City Council for further direction.

ATTACHMENTS

1. Copy of Statement of Work for Feasibility Study
2. Copy of Executive Summary of Feasibility Study for Wireless Communication Network in Folsom

RECOMMENDATION/CITY COUNCIL ACTION

Staff recommends the City Council provide direction to staff pertaining to development of a wireless communication network in Folsom. In particular, staff requests City

Council direct staff, via motion, to proceed with a pilot program to demonstrate the merits and benefits of a WiMax system.

Respectfully submitted,

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Joseph W. Luchi, Economic Development Coordinator

Attachment No. 1

Attachment No. 2