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MEMORANDUM

To: David Ramsay
From: Brenda Cooper
Date: May 3, 2007
Subject: Council Technology and Wireless in the Parks Study Session

RECOMMENDATION

We expect to spend about one third of the study session on the wireless project. To prepare, we are requesting that Council read this memorandum and be prepared to discuss and provide guidance on the Kirkland Free Wireless program so that we can build the level of support Council would like into the upcoming CIP process.

During the study session, we also plan to provide Council with an update on the IT Strategic Plan progress, provide a demonstration of technology we are about to deploy for workers in the field, and give you a few minutes to ask any questions you might have about technology.

The rest of this memo is devoted to the wireless project since we wanted you to have time to absorb the data that we have.

POLICY IMPLICATIONS

Generally, there are no significant policy implications unless Council directs us to build a citywide network or directs us to partner with a private provider. We are not recommending either option at this time. The wireless network does support Council goals around livability and economic development.

BACKGROUND DISCUSSION

Project History

During the 2005/6 budget process, City Council approved a wireless pilot project primarily aimed at providing wireless in selected city parks. The goals of the project were to run a pilot program for about eighteen months and use that time to gather usage information and community reaction to the project. It was decided to run the pilot in Peter Kirk and Marina Parks, and in parts of downtown, creating a sort of wireless corridor from the lake up almost to Park Place. The network is free, unlimited use, and doesn't require a password or user authentication, although users are required to agree that they understand the network is unsecured and that they will be responsible users before they can access the internet through it. Although the project started out being referred to as "Wireless in the Parks," we now generally refer to it as "Kirkland Free Wireless" since it is also available downtown.

For the 2007/8 budget process, City Council funded a service package to keep the current configuration of Kirkland Free Wireless operating through the end of 2008.

Network Costs and Support

We encountered more difficulties than expected initially getting the network set up, and it took about three months to stabilize. Since then, we spend five to eight hours a week testing and supporting the network as configured.

Initial CIP budget:	\$115,600
Current Balance	4,447

We are still under budget, although barely. Implementing the recommendations of the re-engineering study we are performing now may cause us to be slightly over budget. We should have those recommendations by late May in time to do some network tuning before the summer.

Service package approved for 2007/8 budget	\$29,049
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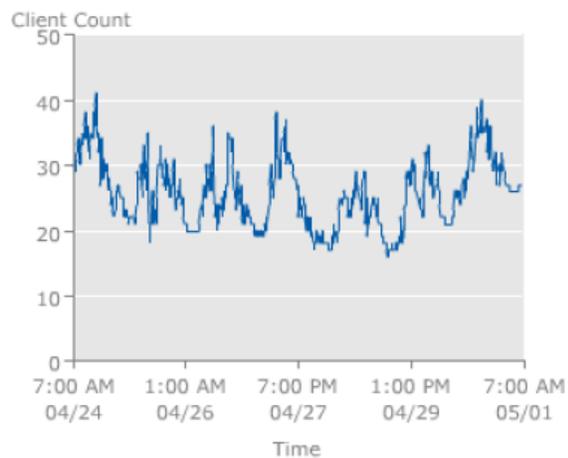
The service package includes true one-time costs and about \$13,000 a year in what will be ongoing costs for repairs and maintenance, and communications to continue using the network through 2008.

Note that the cost of implementing and supporting wireless zones is sensitive to location. The area that we chose has been fairly low-cost since we already had fiber there to hook the network routers to, and because to provide troubleshooting, testing, or support, we can easily walk down to the pilot area from our desks. Council should assume that other areas will require more staff time and perhaps more infrastructure investment should they desire to expand the network (areas near our fiber network will be significantly less expensive than areas which are not near existing city-owned fiber).

Network Usage

The graph to the right shows usage from the last week of April. As you can see, there were between twenty and forty people connected all the time. We assume that some of the overnight connections are persistent (that is connected devices that are not in active use and are not turned off). Daily usage in January was around fifteen to thirty people at any given time. We assume the increase usage is due to a combination of better weather and the opening of the Starbucks.

Associated 802.11b/g Clients for 'Outdoor Phase1'



Challenges and Lessons Learned

In general, the experience with this network has been very positive, and it has good acceptance from people downtown and in the parks. But nothing this complex is free of challenges:

Technical challenges:

- We've had complaints from some people who had trouble connecting to their workplace from the wireless network. We're looking into that.
- We did learn that we have to physically test the network. It can appear to be working great from City Hall, and yet the user experience can be problematic.
- Customer expectations for reliability need to be managed. Outdoor networks can be affected by environmental factors and are less reliable than indoor wireless networks like the ones in our conference room. Trucks do not drive between the computer and the access point in our conference rooms very often, but that is a typical occurrence downtown.
- Customer expectations for coverage also need to be managed. Our network was designed to provide coverage in public locations like the streets and parks, but people typically want to use it inside coffee houses. It is usually useable inside the front windows of coffee shops, but loses clarity and reliability the further customers go from the street.

Design challenges:

- Access points are not connecting to each other in the ways they were originally supposed to, but rather one of the two fiber-connected nodes is carrying almost all of the network traffic. We are doing a small touch-up engineering study to determine why and see how we might better optimize the network.
- We forgot to design shade into the parks except under trees, and laptop screens are really hard to read in beautiful direct sunlight.



Customer Feedback

We posted a user questionnaire in January of 2007. By the end of April, we had fifty customer responses. Note that because of the time frame (largely winter) that we have collected results, the answers are probably skewed heavily toward downtown users. We will continue to run the survey through the end of the summer. Survey responses have been collated for you in the following table:

Wireless in the Parks Questionnaire

Results as of March 1st, 2007 50 users.

Note: Winter survey. Will be skewed to downtown users

Question	Responses	Notes
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Live or work in Kirkland?

Do not live or work in Kirkland	15
Do not live but work in Kirkland	9
Live but do not work in Kirkland	17
Live and work in Kirkland	9

Have you used the network?

Yes	No
26	5

Note: Everyone answered the next question as if they have used the network

Frequency of Use

I've only used it once or twice	12
Periodic User - once a week or less	12
Regular User - once every few days	26

What do you use the network for?

Primarily personal	12
Primarily business	24
A mix that's at least 25% of each	14

How reliable has the network been for you?

I have not found it be reliable	1
It sometimes works	3
It usually works, but I've had problems more than once	17
It almost always works well when I try to use it	29

The pilot will end near the end of the summer of 2007. When the pilot is finished, would you like to see the wireless network:

No answer 2

Same Service, Same Place: Same level of service (free and unsecured, taxpayer funded), and same location (Peter Kirk Park, Marina Park, and part of downtown). 8

Very satisfied with the service available;

<u>Same service, a few more places:</u> Same level of services, and add a location or two a year as funding is available.	23	
<u>Same service, a lot more places:</u> Same as above, but we might need to increase taxes or charge fees to fund the expansion.	10	I'm torn between "add locations as funding is available" and "add locations but charge a small fee". I'm open to both, or a combination????? Maybe businesses in the area would be willing to pay a fee to the city rather than to their current DSL or wireless provider if they could use the network as well. THANK YOU. I LOVE THIS!!!!
<u>Different service, a lot more places:</u> Partner with a service provider, provide as close to city-wide coverage as we can. Create a more secure and "professional" network that would probably cost money to use in most cases.	5	
Other	1	blanket the entire city
If the network is expanded, where would you like to see it go (choose all that apply, or none)?		
No answer	8	
Citywide	22	
Juanita Beach and Juanita Bay parks	11	Lots of people go to Juanita Beaches and Park and Totem Lake neighborhood could benefit from this too.
Totem Lake	9	
More Business Districts	16	
More Neighborhood Parks	13	
Other	3	Redmond. Park Place. Everywhere.
How did you find out about the network?		
No Answer	3	
I opened my laptop and found it	30	
Kirkland Courier	4	
Kirkland website	2	
Someone told me about it	9	
Other	2	50 Saw sign in area; A small leaflet found in one of the Kirkland Shops

Comments
Great service. Thank you. Don't let it end as I can take my "office" almost any where in town.
Wonderful! Makes me come to Kirkland more often because I know I can finish any business I may have.
This service is awesome....Plz don't discontinue it.....!!!!!!
Expand it with a Service Provider. It's great asset to have.
Since the City of Kirkland insists on turning this into a "pedestrian? community, then free wireless access should be available to those who wish to wander and use their computer along the way.
I currently have a t-mobile account and it would be helpful to partner with a service that was partnered with multiple service providers to eliminate the need to sign up for another service. I think Boingo does this.
Allow for not having to click "access" each time I try logging on after having been logged off for a while; allow Kirkland residents higher bandwidth; discontinue censoring/filtering of non-"family" sites.
<p>I just tried to send the following message via your link to "wireless@ci.kirkland.wa.us" and it bounced back with "The message reached the recipient's e-mail system, but delivery was refused."</p> <p>Your efforts to pilot a free community wireless are appreciated and I hope it grows into more comprehensive, stronger coverage. I have a boat moored in the KYC Marina just south of the Kirkland Marina. I have been using my Verizon cellular broadband for the last year or so for Internet access from the boat but I saw your splash page come up today so I thought I'd try to log on. I don't know where you access point(s) are placed but the signal strength in front of Anthony's Homeport is minimal. Our boat is actually toward the north end of our marina...we're probably only 100 yards directly south of where the Kirkland Marina dock meets the shoreline.</p> <p>I get an alternating one to two bar signal (of five) and it's not strong enough to hold a VPN connection to my office. I'll keep trying to log on periodically to see whether I can get a little stronger signal over the next few months. Are you planning to add more access points in the near future? I needed to bring up my cellular broadband to be able to send this email but hopefully that will change in the future.</p> <p>Again, thanks for the efforts to provide wireless service and I hope it's a first step in a larger effort.</p>
<p>Would be great to see more advertising on home pages1. www.kirklanddowntown.org2. www.explorekirkland.comIt is especially poor inside Lakeshore Veggie House (www.bestveggiehouse.com). Perhaps this could be bolstered inexpensively by adding paid (funded by the businesses) access points inside the frequently used locations for example restaurant, cafes and bakeries.</p>
<p>Something is not correctly configured to allow for VPN connectivity which is critical if people are to use it for casual business connectivity. In this case I am not able to connect to the MSFT VPN. This is a nice service to have but not essential for me as I use my cell phone for broadband and VPN connectivity in public places.</p>
<p>I think this is a really great idea, and that if more people know about it, they will use it. Everybody loves free internet and Kirkland is the kind of place where people will enjoy this service.</p>

We have an email address setup specifically for the wireless project. Since we have already shared some of the email with you, I won't duplicate it all here, but a representative example is below:

- Very nice surprise to have wireless on the dock, my wife and I are over-nighting for the first time and love the waterfront here in Kirkland. Please pass on our thanks to the planning team involved with making this pilot wireless project possible. Keep up the great service!
- This is a great idea. Don't pull the plug on this project.
Citywide wireless from the big companies is a few years off, but it would be very cool to have a few more hotspots like this that have free wi-fi. It would be good to advertise to visitors and on the site. I'm about to head over to the FAQ and read up on it and I will test this out once it gets a little warmer out. You should make sure people know how easy this is to do from their PDAs and phones versus going to a Tully's (free) or a Starbuck's (premium).
- I know that you can make wireless possible. I am one of the owners at Kingsgate Ridge Condo
This is what I found out about the wireless in Kirkland Area today.
http://www.ci.kirkland.wa.us/depart/Information_Technology/Kirkland_Free_Wireless/Frequently_Asked_Questions.htm.
Could you see if you can extend wireless to our complex with over 200 families at no additional cost to us? We have a lot of low income or fixed income family living here.
- Hi, I have happily connected to your wireless service in Kirkland, but it doesn't work, and it says re-open your browser.
Never works.
How come people are so unable to do a task so simple as setting up a wireless system like this? Kirkland! Wireless! Great service, way to go Kirkland!
Oh, but just one thing.....
.... it doesn't work
- Getting some work done here in downtown over a cup of coffee.....
(contact info snipped) (Let's get wi-fi to Houghton!)
- Definitely a strong reason to visit, shop, and spend time in the Kirkland downtown area.
- I wanted to thank you for the free wi-fi project. I'm a real estate appraiser who is constantly in the field. I have a laptop so that I can keep my work moving even when I'm away from my home office, but I often need to do research on the internet and am constantly on the look out for a wi-fi connection. I was very excited when I discovered that I can work anywhere in/around your downtown area. It definitely saved the day today, when I needed to put some finishing touches on a report and get it emailed out to the client on-time.
On a side note, however, I parked in a 2hr spot at 4pm and arrived to a ticket on my call when I returned just before six. The ticket was time stamped 5:49 and stated that I was 20 minutes over! Unfortunately, the office was closed by the time I discovered the errant ticket, so I have not yet been able to remedy the situation. I plan to call during business hours tomorrow and am looking forward to a quick resolution. Before receiving the ticket, I was thinking that I want to try to get more work in this area as it's a pleasant place to do business as well as shop and eat! But, after getting a ticket for legitimately parking downtown, I'm not so sure.....
Best of luck to you on this trial project. I hope it becomes permanent and sets the bar for other cities in the Puget Sound area.

Possible Future Choices

<u>Choice</u>	<u>Survey Numbers</u>	<u>Comments</u>
<u>Discontinue service</u>	Not given as option on survey	Would require taking down the equipment and signs. There would be little to no residual value in the equipment at this time.
<u>Same Service, Same Place:</u> Same level of service (free and unsecured, taxpayer funded), and same location (Peter Kirk Park, Marina Park, and part of downtown).	8	We would like to continue optimizing this option, including some network re-design and the design of some benches that would make the network easier to use on sunny days
<u>Same service, a few more places:</u> Same level of services, and add a location or two a year as funding is available.	23	We agree with the majority of our survey respondents, and feel that new locations should be slowly added as funding can be worked into major park development efforts or becomes available from one-time sources.
<u>Same service, a lot more places:</u> Same as above, but we might need to increase taxes or charge fees to fund the expansion.	10	It is much less expensive to administer a network that we own and don't place restrictions on or take money for. We don't believe that city wifi is a money-making proposition for us because we have a number of local businesses that provide paid access, some of which can even be accessed from the public locations that fit our current business model. We are not in a position to compete effectively with them, and have no business driver to do that (rather, we would like to see them succeed).
<u>Different service, a lot more places:</u> Partner with a service provider, provide as close to city-wide coverage as we can. Create a more secure and "professional" network that would probably cost money to use in most cases.	5	This is an untested business model that we have been watching. Currently, major municipal wifi providers like EarthLink are not expanding into new markets but are trying to get their current markets to work. We think this should still be watched in case it becomes a good idea in the future.

Recommendation

We'd like to stay the course on this project through the end of 2008, keeping the network where it is and continuing to improve our existing service. We may request funding for enhancement in the downtown area and for benches with shade as part of the CIP process. We are also pretty busy and don't have any way to add staff at this juncture. We will also need to start budgeting for equipment upgrades and/or replacement in 2009 or 2010, which will part of this CIP process. We'd also like to advertise more, since most people found it by accident.

In the longer term, we'd like to slowly add network locations as the cost becomes feasible. We consider prime locations for expansion to be Juanita Bay and Beach Parks and the associated close-by business district, McAuliffe Park, and other business districts like Houghton and Totem Lake. If we can also get staff help, we could add two or three locations in the 2009/10 time frame. We'd be happy to do so sooner if the funding is available.