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CITY OF **VANCOUVER**

ADMINISTRATIVE REPORT

Report Date:	January 2, 2007
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TO: Standing Committee on City Services and Budgets

FROM: The General Manager of Corporate Services, in consultation with the General Manager of Engineering Services

SUBJECT: Options for Deployment of a Municipal Wireless Network

RECOMMENDATION

THAT Council instruct the General Manager of Engineering Services to prepare for Council's approval a policy regarding the use by the private sector of City-owned infrastructure to build privately operated wireless networks at an estimated cost of $60,000, to be funded from the 2007 Strategic Initiatives Fund.

CITY MANAGER'S COMMENTS

In February 2006, Council adopted a motion directing staff to report back on the desirability and options of pursuing a free or low cost high speed wireless municipal network for the City of Vancouver. This report provides discussion relevant to Council's request.

City staff has determined that it is impossible to move forward with a municipal wireless network at no cost to taxpayers. However, in recognition of the fact that private sector companies could in the future want to use City infrastructure to build a wireless network - and that their right to do so is federally mandated by Industry Canada – the City will require a policy framework which lays out the terms and conditions of use, as well as a cost recovery model. The details of this approach are contained in #3 of the Deployment Options section of the report. The City Manager recommends approval, with the caveat that the development of a policy framework does not by itself address the social and community objectives stipulated by Council.

The report provides details of alternative business models and deployment scenarios. However, the City Manager does not recommend proceeding with any of the other options outlined in the report at this time. The City of Vancouver should not become a telecommunications provider competing with the private sector: if there is market for wireless internet access services, the private sector will build and support it in a way which adds value to its shareholders. Further, it is our view that there are no City business processes which could immediately leverage Wi-Fi technology without further analysis and investment. To realize any or all of the stated Council goals, the City would have to make a substantial investment in an additional study to assess market and community readiness for Wi-Fi.

Should Council decide to go beyond staff's recommendation, Council could instruct the City Manager to investigate and report back on a business model that would provide the City with a more active role in deploying a wireless network across the municipality. This study – outlined in Option #4 in the Deployment Options section of this report - would involve technical consulting, a public consultation process and project management at an estimated cost of $340,000 over six months. It is anticipated that a further cost of approximately $100,000 would be required to develop and issue an RFP, evaluate responses and negotiate a contract with the successful proponent.

COUNCIL POLICY

Related policies exist for the construction of cellular towers and the installation of cellular antennae.

PURPOSE

On February 14, 2006, Council adopted the following motion:

WHEREAS:

1. Many cities are investing in wireless municipal infrastructure;
2. free or low-cost wireless internet services can serve both business and community goals;
3. various models have been adopted, usually involving public and private partners;

THEREFORE BE IT RESOLVED

THAT staff report back on the desirability and options for pursuing a free or low cost high-speed wireless municipal internet system in selected areas of the City in a way that does not add costs to City taxpayers, to achieve the goals of:

1. Promoting business;
2. Building community through electronic connectivity;
3. Bridging the digital divide by making internet access more accessible and affordable to low income residents;
4. Reducing communication costs for the City's own operations; and
5. Improving the delivery of emergency and other municipal services,
6. Including the health studies around the implementation of wireless internet services.

This is the requested report.

BACKGROUND

Technologies that enable people and computers to transmit information wirelessly have been available for many years, but mass adoption, constrained by low speeds and high costs, has been relatively slow.

In 2005, interest in the technology community focused on several large city governments that decided to deploy wireless services in their cities. Late in 2005, the City of Vancouver engaged a consultant, Civitium, who had worked with several of these cities, to prepare a high-level report on the potential for Vancouver. That report was delivered in March 2006, and recommended a comprehensive study to address:

- Political and Regulatory compliance;
- A Comprehensive Community Stakeholder analysis;
- Business Model selection, and
- RFI/RFP Development

Staff continued to investigate the technology and engage the community in discussion.

While over 250 North American cities are now reported to be either considering or deploying municipal Wi-Fi, very few cities the size of Vancouver have actual deployments that can be used as a benchmark. Despite its immaturity, this is big business, and it is projected that US cities alone will spend more than $3 billion in the next 4 years on public Wi-Fi deployments.

In Canada, a growing number of cities are looking to deploy Wi-Fi, although few have done so. Fredericton's Fred-eZone has been live for several years, but is a relatively small deployment. Toronto Hydro Telecom's Wi-Fi has been running for only a month or two. Hamilton has just decided to go ahead with a pilot deployment. Locally, the City of Coquitlam is well advanced in looking at both Fibre To The Home (FTTH) and wireless.

In Europe and Asia, while there is a similar acknowledgement that telecommunications infrastructure needs to be regarded as a public utility, efforts are focused more on FTTH than on wireless.

DISCUSSION

Vision of a Wireless City

The vision of a "wireless city" is attractive. If cost barriers are insignificant, if access is available everywhere, if the connection speed is high, and if mobility and location-awareness are enabled, a range of opportunities is presented. A small sampling:

- For either no investment or a small (<$50) investment, most residential and business computers in the city could have unlimited Internet access;
- Reading and feeding of hydro, gas, water and parking meters could be automated, offering not only labour savings, but also feedback on time-of-day use and innovative approaches to billing that (for example) might reward off-peak use;

- Tourists could have instant on-the-street access to what's on, where to go and how to get there, what to see, and guided tours through their smart phone or PDA;
- Subject to privacy concerns being addressed, cameras could either monitor or be activated to display public areas, homes, taxis, transit vehicles, and incidents attended by emergency response crews to provide an additional level of protection to both public and employees;
- "Smart " transit systems could be aware of vehicle locations, could fast-track them through traffic lights, advise travellers of when the next bus is expected, provide travellers with on-transit Internet access, and offer location and facilities information through on-board displays;
- Not only transit, but also commercial and private vehicles could be fitted with GPS receiver-transmitters, opening up numerous possibilities for fleet management, crime prevention, stolen vehicle location and services to drivers;
- Public safety and emergency response personnel could have access to site plans, mug-shots, maps, hazardous materials inventories and information even while travelling to and attending the location of an incident;
- City staff would have on-the-street real-time access to the information they currently have to go back to their offices to get and update – like building inspection schedules, materials orders and timesheets for streets maintenance crews, address look-up of lost dogs, parking ticket issuance, and retrieval of as-built plans for structures and infrastructure;
- Phone and broadcasting services could be overlaid on data service, opening up consumer options with opportunities for new, integrated and repackaged services in the converging voice, data, audio and video market;
- Location-awareness, where a wireless device like a smart phone is aware of which street it is on, which block it is on, which facility or store it is adjacent to and where it is heading, could form the basis of a whole range of internet-based service offerings, and the business opportunities to create those offerings.

To some this world will seem full of exciting potential. To others, it will seem full of threats to their privacy and potential for abuse. Many technologies present a similar dichotomy.

The technology to enable this vision – or such parts of it as we collectively choose to enable - will be here, probably within the next 10 years, but it may not be as affordable as we would like, and, despite marketing claims, it is probably not ready at the moment.

Technology

The primary technologies that are relevant to a consideration of municipal wireless are cellular digital, Wi-Fi, and WiMax:

Cellular Digital is the generic term for the wireless data offering from the incumbent cellular telephone providers Bell, Fido, Rogers, and Telus. Using the cellular infrastructure they have deployed for phone service, they are now offering data speeds of around 300 kbps – considerably faster than phone-based modem services, but still well short of "broadband" – generally considered to be over 1 Mbps. They license portions of the radio frequency spectrum which they have to pay for, and that results in costs that they must pass on to the consumer. The relatively slow speed and relatively high cost mean that these services are

currently not affordable alternatives to wired connections (like ADSL and cable) for most non-business users.

Wi-Fi is a technology that started with short-distance in-building deployments. Typically with an in-building range of less than 100', it was a convenient and sometimes cost-effective alternative to cabling, offering speeds of typically 3 Mbps. It has evolved through increased speed, improved security and "mesh" extensions to a stage where it can provide hot zones rather than simply hot spots. Although technically capable of speeds as high as 50 Mbps when dedicated to a single client, current municipal wireless implementations typically offer speeds of 500 Kbps to 1 Mbps. Wi-Fi hardware has become commoditized. It is included in almost all laptops, and a Wi-Fi card can be bought for a PC for less than $50. Add to that the fact that it operates at radio frequencies that are unlicensed and consequently free, and Wi-Fi has become an inexpensive and ubiquitous standard for wireless provision of Internet access.

WiMax is a longer-range technology that is likely to compete more with cellular digital than with Wi-Fi. It may even complement Wi-Fi, providing the long-haul transmission of data, with Wi-Fi providing the local distribution to the consumer device. Bell and Rogers have jointly deployed a pre-WiMax service in Vancouver. WiMax standards are still being developed, and support is not currently included in consumer equipment.

Wireless technologies are in a state of rapid change:

- Data transmission speeds are roughly doubling every year;
- New protocols are being developed and are vying for the market with older protocols;
- Older protocols are being enhanced through new standards with increased speeds, range, security and mobility features.

In the long term, this evolution will undoubtedly be positive for the consumer, and the vision described earlier will be realized.

In the short term, it is a time of significant risk to invest in a major municipal wireless deployment. While a number of cities are doing so, there are many who question the ability of the Wi-Fi technology to meet expectations. Particular issues include:

- Because it operates in unlicensed radio bands, there are no controls on who or what can share those bands – yet it is still a limited resource. As usage grows, and with it the potential for increased radio interference, continuing availability can not be guaranteed;
- Partly because of its naturally short range, and partly because of its limited ability to penetrate building walls, coverage depends on the number of antennas (known as "access points"). Initial reports of municipal Wi-Fi implementations indicate a typical coverage of around 50% outside. For in-building Internet access it is likely that the signal would need to be picked up at a window and transmitted to inside computers, necessitating additional equipment;
- The "Wi-Fi mesh" technologies typically used in municipal wireless deployments are considered by some to be a fundamentally flawed attempt to make a short-range in-building technology into a wide-area mobile solution. While the vendors of these technologies naturally dispute this, there is relatively little evidence to support claims either way in areas like mobility, quality of service, and interference.

Of the three technologies, the low cost of Wi-Fi has propelled it to the forefront of municipal wireless deployments. It offers the best opportunity to meet Council's goals within the "free or low-cost high-speed" constraints, and most of this report will be focused on Wi-Fi over the other technologies.

We must be realistic in our expectations of the extent to which municipal Wi-Fi can deliver on the vision described above. It can certainly deliver Internet access in selected public places, parks, beaches and streets. The extent to which it can deliver residential and business access will be dependent on the economics – whether the number of such customers justifies the density and distribution of access points that would be necessary to provide competitive performance. Finally, support for truly mobile applications in moving vehicles would have to be tested. With anything less than blanket coverage of the whole city, it is probably better to rely on Cellular Digital and WiMax to provide service for these classes of applications.

Vancouver

Much of the interest in municipal wireless has been prompted by what some US cities have been doing. Without tabulating the cities, the main drivers (which vary quite significantly from city to city) seem to be:

- A perception that some cities are not well served by the incumbent broadband telecommunications providers;
- A recognition of a growing digital divide between rich and poor;
- Provision of cost-effective telecommunications services to municipal sites, and
- Public safety applications, particularly providing police vehicles with access to crime and criminal databases.

In Canada, the emphasis seems to be on providing a more competitive telecommunications environment (while generating some revenue from surplus optical fibre capacity), encouraging development of technology-based businesses, and supporting internal operations and fixed connectivity to remote city sites.

Vancouver is relatively well-served with broadband access:

- Almost every business and residence has a choice of cable and DSL from several providers for fixed wireline Internet access, typically priced from $30 / month up;
- It has a new "pre-WiMax" wireless service (generically referred to as "Inukshuk") that presents an alternative to fixed wireline for nomadic (pick up, move to a new location, set up again) users;
- It has several wireless providers who can provide wireless access by mounting an antenna on a residence or small business office;
- It has a number of Wi-Fi hotspots in cafes, coffee shops, malls and other public use spaces. While difficult to arrive at hard numbers, there are probably 150-200 "for fee" hotspots and at least 200 free hotspots.

Some argue that broadband services in Vancouver could only be improved by more competition, that the existing telcom oligopoly in Vancouver is imperfect, and that the City has a unique opportunity to encourage further competition.

Large cities typically have geographically distributed facilities, like libraries, fire halls and works yards. Many incur high costs leasing telecommunications services to connect these facilities, and for them deploying city-owned wireless infrastructure can generate major savings. The City is fortunate in this regard: Vancouver is relatively compact, and the City owns an extensive duct infrastructure which has permitted deployment of optical fibre to provide data connectivity to its remote sites. Optical fibre is much faster and more reliable than any form of wireless. Around 50% of Vancouver's remote facilities are now connected by optical fibre - a number expected to grow to around 85% by the end of 2008. It should also be noted that Vancouver's public safety requirements are already well served through the E-comm radio system and that a wireless deployment would not likely improve on that.

Business models

A "blanket" Wi-Fi deployment in Vancouver would probably require around 2,000 access points, with an estimated capital cost of the order of $10 million. No estimate is available of operating costs, but they would be significant.

There has to be a sustainable financial model to support this level of capital investment and the post-implementation operating costs, and there is little evidence to date that such a model has been established. Some of the approaches being tried by other cities include:

- A commercial wireless Internet service priced (typically at $15 - $25 per month) below the existing alternatives, taking advantage of the fact that wireless technology now reduces the barrier to entry into that market;
- An advertising-supported model, where the wireless provider generates revenue from advertisements that are, through a variety of means, injected into the web browsing stream. Although this is a part of a number of business models, there is little hard evidence to indicate the level of financial support advertising can generate;
- The city is an "anchor tenant" and, based on projected internal cost savings resulting from its use of the network, commits to buying services at a market rate.

Typical approaches involve combinations of these. As examples:

- San Francisco is looking at free service supported in part by advertising, in part from revenue from a "premium" service;
- Toronto Hydro Telecom is offering 6 months of free service; then a subscription of $29 per month;
- Vail, Colorado, is offering free service at 300 kbps, subscriptions to faster service at $60 US per month;
- Portland, Oregon, will offer free service with advertising, $20 US /month service without advertising, and may buy up to $16 million US in services over 5 years as an anchor tenant.

Deployment Options

The City can consider numerous options. The following 4 are the most likely:

1. Do Nothing:

The City can clearly choose not to intervene in the Vancouver telecommunications market. The private sector has experience providing telecommunications services, and with increasing deregulation competition has opened up considerably over the last decade. There is little doubt that even if the City does nothing, the wireless city vision will eventually be realized.

At the same time, wireless technologies introduce a new dynamic, and the City's ownership of key vertical infrastructure such as lamp standards presents it with an opportunity to use, or offer for use, that infrastructure for the benefit of its citizens.

As the City can act on this relatively easily, doing nothing is not a recommended option.

2. Public Utility:

The City could build and own a wireless network, operating it as a public utility. While this approach would provide the best opportunity to maximize the benefit to the citizens of Vancouver and would offer the potential for future revenue generation, it suffers from several major disadvantages:

- The City would have to finance the capital costs of the network;
- The City would incur the risks described in this report, and
- The City would be directly competing with the private sector in an area where it has little expertise.

Few other cities have taken this approach, and it is not recommended for Vancouver.

3. "Pave the Regulatory Way":

The City would simply facilitate the private sector building the network. At present the City has policy around construction of cellular towers, but that does not adapt well to Wi-Fi access points, which would be considerably smaller and more numerous. This policy could be extended to license access to City-owned "vertical infrastructure", typically the light poles, traffic light supporting infrastructure, and City-owned buildings that are the key assets the City can contribute.

Some areas that a licensing policy would have to address include:

- Aesthetic impact of Wi-Fi access points mounted on lamp standards;
- Compensation to be paid to the City for use of the poles;
- Ownership issues with poles jointly owned by the City and Translink;
- Terms and conditions related to issues such as installation, maintenance, replacement and indemnity;
- Provision of power (most lamp standards do not have power provided to them during daylight hours)
- Perceived radiation issues related to antennae (there has been a significant public issue around cell antennae)
- Level of public involvement in the approval process
- Federal regulatory issues concerning street access and infrastructure access.

Establishing this regulatory framework is dealt with in the Recommendation section of this report and the above work would be completed as part of the Recommendation for Council's consideration.

As a model for realizing the vision described earlier, however, it is lacking. We can anticipate that prime locations (from a commercial perspective) will be overbuilt while other areas will be neglected, and that competition will result in potential radio interference, licensees "camping" on poles, and a patchwork of non-interoperable hot zones that will not advance some of Council's goals.

4. Public Private Partnership (PPP)

In this most widely-deployed model, the City would issue a Request for Proposals (RFP) for a private partner to build and operate the network. At a high level:

The City could offer:

- Non-exclusive access to vertical infrastructures;
- Non-exclusive access to underground duct systems (and possibly aerial routes in limited situations) for optical fibre backhaul;
- Facilitation of the permitting process described under the Private Sector model in #3 above;
- "Anchor tenancies" from stakeholder agencies (including the City), committing to purchase of network services.

The City would expect the successful Proponent to:

- Finance and build the network to certain standards of coverage, availability and security;
- Operate the network within an "Open Service Provider" framework in which the successful proponent would sell wholesale wireless access to service and content providers (who might offer services like Internet access, IPTV, voice, home monitoring or automated meter reading) without restriction;
- Pay the designated rental fees for use of City vertical and horizontal infrastructure, and
- Provide wireless services to anchor tenants at or below market rates.

Through this process, the City could also hope to realize some social benefits. As examples, it could request:

- Multi-tiered service offerings that could provide restricted free access to low-income families, to visitors, or in designated areas;
- Security standards that, by requiring authentication, would minimize the potential for misuse of the network (such as criminal activity);
- Controls to protect the privacy of network registrants;
- The right to pre-empt other users in an emergency situation;
- Standards of acceptability around advertising form and content, and
- Presence on a "captive portal" – a web page that users of the network would pass through when logging on – to help the City communicate services, advisories and special events.

The benefits of this approach are evident:

- It minimizes the risk to the City;
- It is equitable in its use of a public competitive process for identifying a partner;
- It is equitable in providing open network access to competing service providers;

- It gives the City some influence in the deployment and operation of the network, and
- It has the potential for the City either to receive some revenue or to realize cost savings on internal use.

There are also caveats:

- The financial model has to be workable for the successful Proponent, and only through an RFP and possible subsequent negotiation will the City know how many of the potential benefits identified above can be realized;
- There are significant regulatory issues (discussed below) to be worked through. The PPP scenario may not be workable exactly as presented
- Ownership of Vertical Infrastructure: approximately 50% of light poles are owned exclusively by the City. The other 50% (those supporting trolley wires) are owned by Translink, who would have to agree to Wi-Fi access points being mounted on them. No discussions have been conducted with Translink on this subject, although Translink has recently conducted a pilot Wi-Fi implementation on Granville Street bus shelters.

A key component of the above is the concept of anchor tenants – organizations in the Vancouver business community who not only support the concept of municipal Wi-Fi but will actually commit to buying wireless services. "Build it and they will come" is a philosophy broadly espoused by municipal Wi-Fi advocates, but it is a surprisingly cavalier approach. The City would be in a much stronger position to conduct a successful RFP and subsequent negotiation if it can minimize the risk to the successful Proponent by offering assurances of revenue. The City itself can expect to be an anchor tenant. While the level of savings it can expect to realize, and so offer up, depends on both the characteristics of the network and the extent of its optical fibre deployment over the next 2 or 3 years, preliminary estimates of current and anticipated future wireless expenditures are presented in the following table:

Type of use	**Cost Estimate**
Public Safety (Police, Fire)	$300,000
Access to City systems by mobile workforce (building & trades inspectors; streets, utilities & parks maintenance crews; etc.)	$200,000
Blackberry e-mail	$40,000
Point-to-point data communications to remote operations inaccessible by optical fibre	$100,000
Parking Enforcement	TBD
Cell phones	$1,000,000

It should not be expected that a municipal Wi-Fi network would satisfy all these needs. In particular:

- The Public Safety applications would demand assurances of availability and security that might well preclude their co-existence on a public network, and
- The replacement of cell phone use by voice services over a wireless data network would depend on the technology maturing, the characteristics of the network, and the nature of the cell phone use.

As a consequence, cost savings that the City, as an anchor tenant, could offer to the successful Proponent may be as little as $100,000 - $200,000 annually.

Some of these same issues will apply to other potential anchor tenants, whose commitments of future purchases of service will be subject to well-defined service levels. The effort and

cost of doing this should not be under-estimated, but this level of detailed planning is necessary for a successful RFP and subsequent Wi-Fi deployment.

Council should recognize that significant work is involved in investigating this option:

- Engaging the community is essential. This engagement needs to be done formally, with goals articulated, scenarios presented, and feedback invited. There is considerable expertise in both the wireless business and wireless technology in and around Vancouver, and this expertise should be used to advantage. A major initiative like this will stand a much higher chance of success if both residents and businesses support it. The community engagement should include large organizations (like Translink, B.C. Hydro, Terasen, Vancouver Coastal Health, ICBC, Vancouver Port Authority), groups that serve Vancouver's technology industry and other business sectors, and citizens;
- Regulatory issues must be addressed as a business plan is developed, and policy and regulation relating to access to City-owned infrastructure, as described in the "Pave the Regulatory Way" option discussed in #3 above, must be developed;
- The inventory of City assets that can be offered into the partnership must be documented;
- Technology options must be evaluated as necessary to communicate reasonable expectations to the community around service levels, and ultimately to document the City's expectations to potential partners in an RFP; the cost of this study work is estimated at $340,000
- Finally, if the business plan supports proceeding and Council is in agreement, an RFP must be developed and issued and proposals evaluated, at an estimated cost of a further $100,000.

Security and Privacy

Internet-based crime is increasing, with reports of financial scams and pornography distribution making frequent headlines, and tracking down the perpetrators is challenging, even when those perpetrators are working from their homes over landlines. Law enforcers are concerned that unrestricted wireless access would offer criminals an alternative where tracking would be even harder.

None of the 4 deployment options presented above mitigates this risk completely. There are certainly hundreds, possibly thousands of unsecured wireless access points in the city at the moment, and that number can be expected to grow. It is probably safe to say that the more influence the City has in the evolution of wireless services in Vancouver, the more likely it will be able to encourage standards for security, acceptable use and authentication.

There is general consensus that a municipal wireless network should be built to high standards of security, generally involving user registration and authentication. That is at some conflict with the goal of casual use by visitors, although approaches have been developed to address this conflict.

Privacy and security are complementary. Privacy advocates fear that Internet Service Providers (ISPs) may not only sell their subscriber lists and associated personal information, but could also track their use of the Internet and make it available to others. This risk exists now, and it is not clear whether it would be exacerbated by a municipal Wi-Fi deployment,

but it may be another argument for the City to have a role in setting or encouraging standards that, among other things, protect privacy.

Health

For any deployment of Wi-Fi in Vancouver, equipment must comply with federal standards that address primarily exposure to the electromagnetic radiation that these devices generate in order to communicate. The standard is Industry Canada's radio frequency exposure compliance standard RSS-102. For the purpose of regulating exposure to radio frequency fields, Industry Canada has adopted Health Canada's Safety Code 6, which prescribes maximum broadcast power levels for transmitting devices. Locally, the Radiation Protection Service of the BC Centre for Disease Control has studied the health issues around cellular towers and has concluded that they pose no health risk.

There remains a concern on the part of some people that these standards are either inadequate or not well founded on empirical studies. Despite reassurances by the Medical Health Officer, this has resulted in occasional opposition to the construction of cellular antennae in the city (Council's policy is to require a public process around all cellular installations).

A Wi-Fi deployment such as is being considered would not contribute significantly to the overall level of signals that make up our radio environment:

- Vancouver is well served with radio, television, cellular, pager and other wireless services, all of which contribute to a background radio frequency "noise";
- There are hundreds of existing commercial and free Wi-Fi access points provided for the convenience of customers in coffee shops and internet cafes, and probably thousands or tens of thousands more wireless routers in homes;
- The ubiquitous cell phone is generally accepted as safe, yet the nature of its use so close to the body results in signal strengths that are much higher than a Wi-Fi transmitter located 50' away;
- The same unlicensed radio frequencies that are used by Wi-Fi equipment have been used for years by cordless phones and microwave ovens that exist in many homes.

Despite the above, it is impossible to prove that there is no risk, and Council can expect that concerns will be expressed in the community about a city-wide wireless deployment in which access points are clearly visible on City streets.

Regulatory Issues

There are several regulatory issues to be further addressed before the City could be confident in moving forward:

Special Rights / Franchises:

The Vancouver Charter prohibits Council from granting special rights or a franchise to any person without the assent of electors (S.153). While the City may not grant exclusive access to City infrastructure without the assent of electors, the City may grant the successful Proponent non-exclusive access to City infrastructure.

Should exclusive access to City infrastructure be deemed desirable by a successful Proponent, there are two options:

- Obtain the consent of the electors through a plebiscite, or
- Request an amendment to the Charter to allow the grant of special rights or exclusivity in this case.

Federal Jurisdiction:

Wi-Fi is "telecommunications" which is within the exclusive jurisdiction of the federal government. A Wi-Fi provider must:

- Comply with Industry Canada requirements, and
- Comply with the *Telecommunications Act* administered by the Canadian Radio-Television and Telecommunications Commission (CRTC).

Beyond this legislation, we are not aware of the federal government having established any position on municipal Wi-Fi in Canada. In the US, the subject has been controversial and legislation varies from state to state.

In Canada, cell phone antennae placement has been administered by Industry Canada. Most cell phone antennae in Vancouver are located on private buildings. We have a policy which allows placement on other structures such as Hydro poles on City streets however few antennae have been constructed in this way largely because the onus is on the telecommunications company to satisfy nearby residents that the installation is safe.

With Wi-Fi, on-street infrastructure - such as lamp standards or Hydro poles - is the only realistic location for antennae due to the need for a much finer grid of antennae. The federal government remains committed to the roll out of competitive telecommunications providers and for this to occur using Wi-Fi there will be a need for multiple providers to have access to lamp standards and other on-street infrastructure.

Unlike the administration of antennae locations, most aspects of the telecommunications business are regulated by the CRTC. The CRTC has been very clear in many rulings that they are opposed to arrangements which would limit the access of competitive telecommunications providers to the infrastructure necessary to provide service.

We can expect in the future that if Wi-Fi is successful there will be a number of competitive companies that would like to service the Vancouver market. Consequently, we can also expect that the Federal regulators, whether Industry Canada or the CRTC, will be concerned about any arrangements that Vancouver might make to limit access to infrastructure that could support appropriate antennae. Granting special rights or a franchise to one company would likely be strongly opposed by the Industry.

FINANCIAL IMPLICATIONS

Municipal wireless is a complex topic, with few well-established precedents for the City to follow, and a range of conflicting opinions.

It is anticipated that the development of a policy framework as recommended by this report will require a significant amount of staff work involving consultation with wireless providers and the broader community to establish a policy that meets needs and protects the public. The total cost of developing this policy framework is estimated at $60,000 and will be funded from the 2007 Strategic Initiatives Fund. When implemented, there will be a new administrative workload, the magnitude of which will depend on the level of adoption. Those costs can be recovered through fees, subject to Council's approval.

Task	**Internal/External**	**Cost (est.)**
Policy Research and Development	Internal	$30,000
Health & Safety Consulting	External	$30,000
TOTAL		**$60,000**

As noted in the City Manager's Comments, a decision by Council to embark on further study into alternative business models will require additional funding and specialised external resources. The work to be done is summarized below, along with estimated resource requirements and whether they are expected to be available internally or must be external. It should be noted that staff generally are stretched thin: Planning for the City's role in the 2010 Winter Olympics is beginning to introduce a new workload, and at least 4 major information technology related systems (Implementation of 311 Service, Infrastructure Management Strategy, Amanda Permitting/Licensing/Compliance System, and VOIP-based City Telephone System Replacement), will be implemented in the next few years, each introducing significant organizational change and demanding significant staff involvement.

The first phase deliverable – a report to Council which will present a business plan for Council's approval – is expected to take 6 months, with costs estimated as follows:

PUBLIC AND TECHNOLOGY CONSULTING STUDY		
Task	**Internal /External**	**Cost (est.)**
Project Management: Develop terms of reference Engage consulting resources Coordinate staff in gathering information Monitor other municipal wireless deployments Coordinate community engagement, regulatory and technical resources Prepare business plan Report to Council	Internal + External consulting	$ 85,000
Community Engagement: Solicit needs, opportunities and challenges from: Telecommunications companies Governmental entities Business & technology community representatives Cultural & social organizations Other local municipal governments Identify anchor tenants & estimate financial commitment Validate and match deployment scenarios to needs & opportunities Assess & document level of support	External consulting	$90,000
Regulatory Consultation: Framework of an RFP to select a partner Pre-negotiate access to vertical infrastructure Validate proposal with federal government (IC/CRTC)	External consulting	$50,000
Technology Review: Inventory vertical and horizontal infrastructure assets Review potential licensed spectrum availability and suitability Develop technology deployment scenarios (geographic extent, level of service), validate through community engagement	External consulting	$84,500
Contingency (~10%)		$30,950
TOTAL		**$340,450**

Should Council agree to proceed to the implementation stage after this initial study is completed, it is anticipated that a further cost of approximately $100,000 would be incurred to develop and issue an RFP, evaluate responses and negotiate a contract with the successful proponent. This implementation planning cost, which may be better estimated at the end of the initial study phase, would be reported to Council in the business plan report.

CONCLUSION

The vision of a wireless city is attractive, as is a vision of a city whose citizens have universal access to information, unimpeded by financial barriers. Realizing the full spectrum of this vision however will require additional investment to engage in a public consultation process and further study as outlined in Option 4 of this report.

Staff recommends that Council approve the development of a policy framework as outlined in the Recommendation section of this report. Approval of this recommendation would allow

the City to provide some degree of regulation over the use of its infrastructure and would better enable the private sector in building and operating a privately run wireless network.

Other options discussed in this report are not recommended as they would require additional investment and would not therefore meet Council's directive of a free or low cost high-speed wireless municipal internet system, as contained in its resolution of February 14th, 2006.

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VANCOUVER
Economic Development Commission

Municipal Wireless Network

January 2007 Report

Municipal Wireless Network

Vancouver City Council sought the advice of Vancouver Economic Development Commission (VEDC) on the proposal to establish a wireless network throughout the City of Vancouver. The wireless network concept is thought to have a range of economic and social issues that would benefit from insights from the Vancouver business community. The advisory role on this issue would also be one of two "test pilot" issues to engage the VEDC in City policy decisions that affect the City's efforts to build a strong, sustainable economy.

VEDC's position on this issue is taken within the context of the six guiding principles for economic development approved by Council in July 2006 and is intended to move the discussion forward in a positive manner.

RECOMMENDATIONS

1. That City Council endorse the establishment of a city-wide system for wireless internet access as a matter of high priority and on an accelerated time-scale.

2. That City Council instruct city staff to develop a regulatory framework that will encourage the development of this wireless network by allowing private sector service providers to use the City infrastructure for that purpose and establish any other mechanisms needed to encourage this development.

3. That City Council support VEDC in a pro-active role to work with the private sector to investigate and report back on a business model that would provide the City with the opportunity to provide leadership in deploying a wireless network across the municipality. Special attention should be given to specific P3 approaches that incorporate business models that minimize risk to the City and maximize both economic and social benefits. To effect this work, City Council would approve the necessary resources to undertake the work in a substantive and methodical way. VEDC would report back to City Council on this business model within a mutually agreed upon timeframe that reflects the scope of work and resources available.

PROCESS

In response to the City Council request, VEDC's Board established a small sub-committee of Directors in late November 2006 to address the matter. The Wireless Sub-Committee, chaired by Bruce Clayman, reviewed the white paper authored by Civitium dated March 27, 2006, the PowerPoint presentation on the subject made to Council on September 11, 2006, and the Administrative Report authored by Martin Crocker and Shari Wallace dated January 2, 2007 (RTS No. 05576). As well, the sub-committee met with senior City staff members and held discussions with representatives of the local wireless industry cluster interested in the concept.

The draft report from the subcommittee was considered by the Board of Directors of VEDC on January 18th, 2007 and this final report has been endorsed by the Board.

It should be noted that the time frame for VEDC consideration has been very tight. One of the goals of this test pilot is to identify effective ways for the VEDC Board to provide Council with value-added input from an economic development perspective. Recommendations for enhancing VEDC engagement will be made at a future date.

SUMMARY

The VEDC believes that the City should become a world leader in logistics and telecommunications in a manner that will foster economic development, support social enhancements and maintain environmental integrity and it believes that a city-wide wireless network would have the capacity to meet these requirements. VEDC also concurs with City staff that The City of Vancouver should not become a telecommunications provider competing with the private sector for the internet market, but rather provide the "business environment" needed to encourage and support the creation of this capacity. There is a narrow window of opportunity for Vancouver to take action that would put us at the forefront of innovative cities world-wide.

DISCUSSION AND RATIONALE

As mentioned, the Wireless Sub-Committee of VEDC developed its position within the context of the City's Guiding Principles. The Sub-Committee reviewed each of the six guiding principles for civic economic development and provided commentary *in italics* under each of the entries as to the relevance of the proposal to meeting those guidelines.

<u>Competitive Business Climate</u>

Vancouver will establish a competitive business climate that puts the city ahead of competitor jurisdictions.

> *Establishment of a municipal Wi-Fi network would improve Vancouver's business climate and provide the opportunity for improved business efficiency in numerous ways. Unlimited wireless internet access opens up the potential for local businesses to improve access to customers, governments and businesses to use wireless techniques for non intrusive means to gather data (power, water, etc), tourists to access maps and travel information in real time on location, disabled to obtain assistance and support for enhanced mobility and the general public to have more immediate access to information.*
>
> *In addition, the image of Vancouver as a leader in adoption of innovative business tools would be enhanced. Not to do so would result in Vancouver being viewed as behind the times.*

World Class Industry Clusters

Vancouver will identify, grow and build world-class export-oriented industry clusters that contribute to a diverse and resilient economy.

> *Vancouver is already a strong competitor in the wireless space, as exemplified by the 250 companies that are members of WINBC, the industry association. This dynamic cluster is already active in global trade and the creation of a City wide Wi-Fi wireless network would provide them with the opportunity to enhance this position. These firms will gain additional experience from the provision of goods and services, the opportunity to introduce and test new technology in this environment and the ability to market their expertise on a global basis through the success showcased in this endeavor. This will further enhance their competitive position with respect to establishment and operation of systems elsewhere in Canada and around the world.*

Strategic Infrastructure Investment

Vancouver will make investments in infrastructure that are strategic, sustainable, and focused to deliver economic returns to the city.

The City is not required to make significant financial contributions in order to foster a city wide Wi-Fi network. The City simply needs to develop a policy framework that will allow private firms to utilize a range of City equipment as "hosts" for the network and to use their considerable moral suasion to encourage other groups such as Translink to follow suit in a consistent manner.

In turn, the City could make further "strategic" investments into prospective private suppliers depending upon the desires of City Council. Investment by the City, whether of in kind nature or involving additional resources, would be highly strategic – setting the infrastructural stage for further development of the wireless cluster and enhancing business activity in general. The business model would be chosen for its effectiveness and its economic and environmental sustainability. One possibility would be for the City to convert their lease fees into equity in a prospective firm and/or provide "anchor tenancy" agreements for the provision of specific Wi-Fi services in exchange for the private sector implementing activities that support "social" objectives.

The determination of the most effective business model is something that is completely consistent with the mandate of VEDC and should and can be pursued on an "urgent" timeline, with appropriate resources.

<u>High Quality of Life</u>

Vancouver will maintain a high quality of life that attracts and retains skilled and talented workers required to drive the city's economy.

Quality of life in the 21st century includes availability of access to a range of communication channels including the internet. Making that access convenient and universal across the City would enhance quality of life and help achieve these goals. In addition, the strengthening of the wireless cluster, mentioned above, would be a further attractant to highly qualified persons in that industry and related industries such as New Media.

<u>Regional Leadership and Collaboration</u>

Vancouver will provide regional leadership for economic development.

As the first municipality to implement a city-wide wireless system, Vancouver will clearly demonstrate its leadership and will provide a "test bed" for developing new and innovative concepts that could later be deployed across the region and perhaps around the world. If other municipalities choose to adopt the same or similar model, collaboration should result in some economies of scale.

Sustainability

The City of Vancouver will be a global leader in sustainability practices, balancing social, environmental and economic considerations for the benefit of both residents and business.

> *An accessible city-wide wireless system will help enhance sustainable social networks throughout the City and the identification and selection of a sustainable business model will ensure its continuation into the future.*

Conclusion

The VEDC congratulates the City Council and City staff for considering the proposal to establish a municipal wireless network and looks forward to further involvement in the development of a business model that can support and encourage sustainable development in the City.