Municipality-driven business models

Business models for municipal WLAN

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Abstract

Although broadband penetration has grown rapidly, there are still many areas that remain under-served. For these communities, municipal controlled WLAN opens up new options and opportunities. Additionally, wireless changes the cost and policy calculus for deploying last-mile infrastructure.

This paper explores two types of questions regarding municipal WLAN networks; Why are cities & municipal getting involved in deploying these networks & what kind of business models alterative are there.

Keywords: Municipality, WLAN, Mesh WLAN, municipal, involvement, motivation, business models.

1 Introduction

In the last few years there have been a growing number of municipal deployed WLAN networks. However to many people municipal enthusiasm for deploying and operating telecommunication networks, comes at a surprise because of the prevailing trend of deregulation and privatization in public utilities *[1]*

Increasingly, cities and municipalities are recognizing the power of providing wireless access for their employees, businesses and residents. Motivations range from ensuring Internet access for low income families, to attracting and keeping businesses via affordable access to broadband services, to decreasing costs for municipal networks while increasing city worker productivity.

Wireless broadband technologies such as, WLAN is increasing its popularity — primarily because of the lower deployment and capital costs and the freedom from cabling. *[4]*

2 Technology

Understanding the key design parameters "Wireless broadband" encompasses a dizzying array of technologies with widely disparate economic and performance characteristics.

However as this paper is about WLAN only those solutions will be presented in the study. There are basically three different WLAN models available for use today.

2.1 WLAN Networks

In the WLAN model access points distributed throughout each building provide secure Internet access to authorized mobile users nearby. Authorized users may access information stored in the headquarters through an Internet connection and custom extranet. The buildings themselves are connected by different kind of cable solutions.
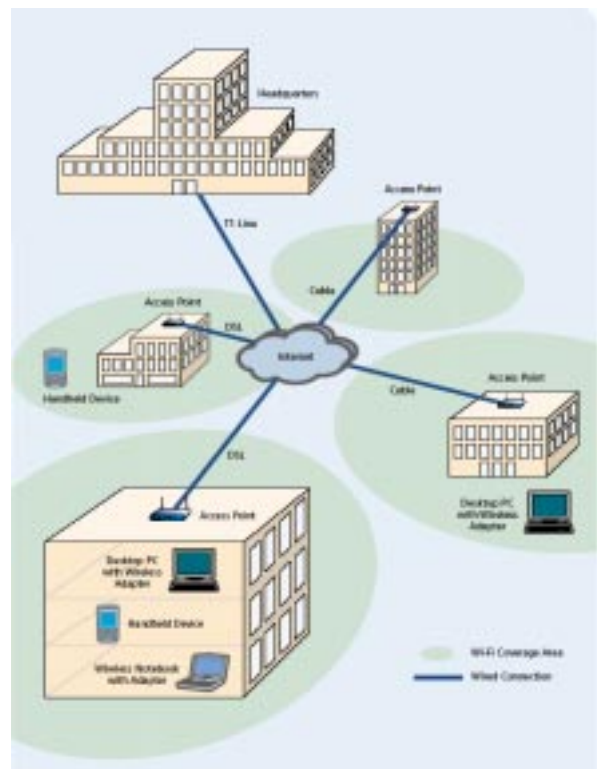

Figure 1. Standard WLAN model

2.2 Mesh WLAN Networks

To cover a large metropolitan region the Mesh approach has also been discussed. [5]

It is based on Mesh Enabled Architecture (MEA) or Quadrature Division Multiple Access (QDMA) radio protocol & the idea is to have a system where *[3]* the end points are linked to each other and then back to the wired Internet. In some designs, only base stations can act as wireless routers, handling traffic for both their own

clients and other base stations as well. In other designs, every subscriber unit acts as both end point and transit point, greatly increasing the redundancy, but also the complexity of the network. [5]
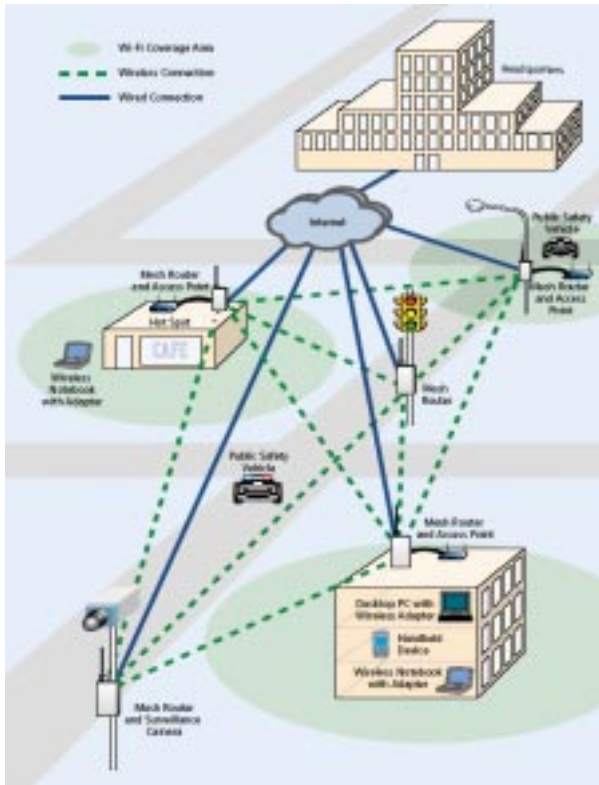

Figure 3. Mesh WLAN model

3 The municipal role in providing Communication infrastructure

The force that is driving the current wave of municipal WLAN deployment is that e.g. WLAN networks are relatively inexpensive to deploy and to operate and also take advantage of available city assets such at street lights and urban furniture which make ideal antenna sites.

Municipal entry into communication services may be justified economically in three basic types of scenarios:

(1) In a response to a market failure

(2) As part of the local municipal's role in providing basic infrastructure services

(3) In a way to opportunistically take advantage of scale or scope economies afforded by investments or services that were put in place for another reason.

3.1 Market failure

In this case the municipal involvement may be needed because the private alternatives are inadequate. The costs of deploying infrastructure and operating services may be too high relative to the revenue that can be expected so that an insufficient number of private sector providers enter the market. In the most extreme cases, it may be uneconomic for any private carrier to offer the service.

The lack of adequate competitive alternatives may arise for a number of reasons. The market may be too small to sustain more than one facilities-based provider (i.e., a natural monopoly), or even if there are two or three competitors, competition may fail to be sufficiently robust

However, even if a local municipal does decide to invest in local access infrastructure, this does not mean that the municipality needs to provide end-to-end retail services. There are a variety of business models available for how a municipality may offer such services. These include:

(1) Retail Service Model

(2) Franchise Model

(3) Real Estate Model

(4) Coordination Model

3.1.2 Retail Service Model

In the Retail Service model, the municipality offers retail services to consumers over infrastructure that it owns and operates. This form of entry requires the greatest degree of resources and operating involvement in providing communication services,

3.1.3 Franchise Model

At the moment the most common model deployed is the Franchise model wherein the municipality contracts with a private firm to build and operate the facilities. While it is possible that the incumbent telephone or cable company could respond to the municipality's bid, in most cases, the respondents are new carriers. The basic model is similar to the traditional model of municipally franchised cable television service.

Wireless alters the range of players that might be considered and the architectures/services that might be offered.

3.1.4 Real Estate Model

The Real estate model presents a much more limited form of municipal entry. Under this model, the municipality provides access to conduit or public rights-of-way. In the wired-world, this includes access for stringing or burying cables; while in the wireless world, it includes locations for mounting antennas. In this model, the municipality partners with private providers

to deliver end-to-end services to consumers. This model requires relatively limited investments in communications specific resources and capabilities, yet offers an opportunity for the local municipal to manage access to outside plant

3.1.5 Coordination Model:

Another minimalist and common form for municipal entry is the Coordination model. In this case, the municipality provides a nexus for demand aggregation (e.g., buyer groups).

By aggregating demand, the municipality may be able to e.g. reduce the risks (and costs) to private sector entry by demonstrating an assured base of demand for broadband services. Wireless technologies, and especially the potential for edge-based/customer-provided infrastructure through mesh networking, raise new opportunities for municipalities to help coordinate community networking efforts. The municipality can help educate consumers as to new technical options for deploying local wireless hot spots and linking those together to support community-wide coverage networks. *[2]*

3.2 Basic Infrastructure

According to the "basic infrastructure" rationale, municipal networks may be justified as just another example of community provision of basic infrastructure services. These are services that are

(1) Used by everybody and are perceived as essential services;

(2) May be a natural monopoly or have a public goods aspect (i.e. excluding non-paying users is costly)

(3) Provide important spill-over benefits that are central to or

Obvious examples include roads and water and sewage systems. While these could be provided via regulated private contractors, such an approach is relatively rare. Other basic infrastructure services include electric power and gas distribution and public transportation.

Because basic infrastructure is perceived as essential to economic activity (i.e., it is used by most businesses), ensuring adequate access to such services is viewed as necessary to promote economic development goals. Additionally, access to communications and media services is often viewed as important for a number of social goals. For example, it can help maintain community cohesion, support democracy and the functioning of the society. While the "basic infrastructure" model appears distinct, it may be subsumed as just another example of a "market failure" *[2]*

3.3 Opportunistic

The third rationale – "opportunistic entry" – is associated with situations where the municipality is doing something else that makes it relatively low cost for them to expand into offering communication services. The municipality's entry into communication services may be able to take advantage of scale and scope economies when only an incremental investment is required to expand into communication services. *[2]*

4 Some arguments against municipal involvement

Even though municipal involvement is increasingly getting more common in the WLAN communication field, the feedback and reception is not always positive.

Opponents of municipal WLAN type of deployment raise three main objections.

Firstly they claim that the municipal involvement results in an unfair competition for private carriers because the municipal is able to use public assets, regulate the private companies, avoid fees and taxes, obtain low cost finance i.e. allowing them to offer network access at below-cost prices.

Secondly they argue that municipal municipals have no particular technology expertise and are likely to prove incompetent in selecting technological approaches application and business models

Thirdly they believe that municipal intervention favoring one specific technology creates a distortion by foreclosing competition among alternatives in the market place *[1]*

Another thing that also is worth considering is that in some countries (e.g. in Finland) the regulator has defined WLAN Hotspot services as public telecommunication if the services are offered without prior restrictions (authentication). This means that the municipals get operator obligations concerning both quality & security of the network – adding additional complexity and costs.

When taking these views into account it is easy to notice some consideration is needed when deploring municipal WLAN. When extending municipal activity into rapidly changing markets like those for communication services, it would especially for communities without a municipal utility or a technically sophisticated local resource be worth considering if the desired results & effects are possible to reach without a too direct role in the provisioning of broadband services. With wireless technologies especially, the franchise, real estate, or coordination models seem especially attractive in these cases.

5   Summary

In the last few years there has been a growing number of municipal deployed WLAN networks. The most common WLAN network models are: Standard WLAN Networks & Mesh Networks.

The force that is driving the current wave of municipal WLAN deployment is that they are relatively inexpensive to deploy and to operate and also take advantage of available city assets.

Municipal entry into communication services may be justified economically in three basic types of scenarios: 1) In a response to a market failure 2) As part of the local municipal's role in providing basic infrastructure services 3) In a way to opportunistically take advantage of scale or scope economies afforded by investments or services that were put in place for another reason.

However the municipality does not need to provide end-to-end retail services. There are a variety of business models available for how a municipality may offer such services. These include the Retail Service Model, the Franchise Model, the Real Estate Model and the Coordination Model

Even though municipal involvement in the WLAN area in many cases has been successful, not all of the reception has been positive.

After studying the different reasons for municipal involvement together with the available business model it is worth to notice that an municipal without a utility or a technically sophisticated local resource should be careful to assume a too direct a role in rapidly changing markets as the communication market especially as the desired effects often can be reached with surprisingly small contributions & involvement.

References

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Additional Reading

Several sites on Internet, e.g.

http://www.dailywireless.org/

http://www.calcomwebsite.com/

http://www.w2i.org/