INTERNATIONAL MUNICIPAL LAWYERS ASSOCIATION



Work Session: VII Across the Spectrum: Hot Topics in Telecommunications

Title: WiFi – What it is and How to Deal With It

by

Presenter: Adrian E. Herbst

Presenter's Title: Principal

Presenter's Office: The Baller Herbst Law Group, P.C.

© 2006 International Municipal Lawyers Association. This is an informational and educational report distributed by the International Municipal Lawyers Association during its 2006 Annual Conference, held September 17-20, 2006 in Portland, Oregon. IMLA assumes no responsibility for the policies or positions presented in the report or for the presentation of its contents.

IMLA'S 71st ANNUAL CONFERENCE

"Following in the Footsteps of Lewis and Clark: Exploring New Frontiers in Local Government Law"

September 17-20, 2006

WiFi – What it is and How to Deal With It

Presented by:

THE BALLER HERBST LAW GROUP, P.C.

Adrian E. Herbst, Esq.
377N Grain Exchange Building
301 Fourth Avenue South
Minneapolis, Minnesota 55415
(612) 339-2026
(612) 339-4789 (facsimile)
aherbst@baller.com
www.baller.com

Adrian E. Herbst

Adrian Herbst heads the Minneapolis office of The Baller Herbst Law Group. For more than 35 years he has been on the cutting edge of cable and telecommunications matters, providing regular consulting and legal assistance to municipalities throughout the United States. This has included the initial franchising processes for cable communications as well as renewals, transfers of ownership, and a wide-range of administrative enforcement matters and development of local programming and issues related to local programming. Recently, his work has expanded with the broadband services offered in cable and telecommunications systems to include planning, competition policy, and internet services.

He has served as a key member of many national organizations in programs to provide assistance to local governments, including International Municipal Lawyers Association (IMLA), National Association of Telecommunications Officers and Advisors (NATOA), the Alliance for Community Media and the National League of Cities (NLC). He has served in many capacities on behalf of these national organizations, including developing model ordinances for IMLA and chairing a specialized rights-of-way taskforce for NATOA that developed policies and guidelines for local units of governments throughout the country. He has served as President of the Minnesota Trial Lawyers Association and Vice President of the League of Minnesota Cities and is also a member of various other legal organizations including the Federal Communications Bar Association, and the Telecommunications Committee of the Minnesota State Bar Association.

Mr. Herbst has a unique background in municipal and governmental law and policy, having been a full-time City Attorney and elected City Councilman for 16 years for the City of Bloomington, Minnesota. While serving as City Attorney, Mr. Herbst led a group that was instrumental in the development of the initial franchises for cable services. As a result of this experience, he advised many municipal organizations both on the state and national level to help initiate procedures and guidelines for cable franchising. Further, because of this unique background, he was selected to serve as General Counsel for the Economic Development Authority for the City of Bloomington, Minnesota and was instrumental in the acquisition of land for development, public financing, and spearheaded the creation, development, and negotiation of a development agreement that led to the development of the Mall of America, the largest single shopping mall and attraction center in the country.

Mr. Herbst's cable television and telecommunications services to clients include the following:

- Initial franchising
- Refranchising/renewals
- Franchise administration and enforcement
- Transfer or sale of ownership
- Feasibility studies of construction of municipal fiber optic networks
- Municipal ownership
- Performance audit
- Technical review
- Financial audits
- Franchise fee audit

- Rate regulation
- Litigation
- Negotiation
- Ordinance drafting
- Non-profit access corporations
- Public, educational and governmental operations
- Institutional network, voice, video, and data systems operations
- Programming agreements
- Community needs assessment
- Customer service standards
- Municipal rights-of-way issues
- Telecommunications planning
- Municipal websites and “E” Government
- Internet related matters, including voice over IP
- Wireless services and local ordinances and zoning
- FCC Proceedings
- Cable and Telecommunications Legislation
- Public Safety Radio Systems
- 800 MHz - Rebanding

OVERVIEW

Local Governments want to ensure that residents, institutions and businesses will have access to competitive communications services, particularly high-speed Internet access, in the near term. They view this as an important matter of economic development and quality of life. Municipal WiFi broadband initiatives may be an answer for many communities. There are numerous examples of cities across the country that have undertaken the development of WiFi and/or fiber systems.

The options for local governments are occurring against the backdrop of considerable upheaval in the communications industry. The critical technological, economic, marketing, political and legal underpinnings of the communications industry have been in constant flux since the enactment of the Telecommunications Act of 1996. Rapid and dramatic changes have occurred in communications technologies, in the nature and size of communications service providers, and in the ways that such providers market and deliver their services. New technologies and improved generations of existing technologies are emerging every day, including fiber, wireless, and broadband over power lines. Telephone companies are beginning to provide television programming over their phone lines, cable operators are beginning to offer telephone services over their cable systems, and telephone companies, cable operators, wireless firms, satellite systems, power utilities, and entities of various other kinds are offering Internet access over a broad range of wireline or wireless facilities. Many of these providers are, or will soon be, offering the "triple play" of voice, video and broadband services bundled together in complex packages that make service-by-service comparisons and cost/price/revenue allocations impossible.

In the face of these and other significant changes, Congress, the Federal Communications Commission, state and local governments, service providers, investors, consumers, and the courts, have had great difficulty in understanding and applying the current communications laws in a coherent way. As a result, widespread consensus has emerged on the need for a comprehensive overhaul. In response, all major stakeholders, particularly the giant telephone and cable companies, are jockeying at all levels of government to obtain the combination of regulation and deregulation that best suits their purposes. This year's on-going battles in the House and Senate are a product of this.

In this environment, no one can be fully confident in forecasting the future of the communications industry, or the final shape of the laws that will govern it. Nevertheless, we believe that it is possible to identify the main issues that will affect the local governments communications initiative and make reasonable predictions and recommendations on how to proceed.

While there is a distinct possibility that Congress will adopt a new law facilitating municipal entry and participation in broadband, the fact is that despite the large number of fundamental changes that are currently being debated on the federal level, for immediate purposes it is local and state law that will largely determine what local governments can do and how it can do it. Many states have laws that place significant restrictions on the ability and manner in which a local government may be involved in the provision of broadband communications services.

There is, however, latitude under the laws with respect to the indirect facilitation of services by third-party private entities.

DEFINITIONS (DESCRIPTIONS) OF WIFI AND RELATED TERMS

We have included several definitions (descriptions) of terms in this section that have been taken directly from www.wikipedia.com, the free encyclopedia on line that everyone can edit. By searching the key word "wifi" a person will find the site. The word descriptions provide further information and numerous "links" to further information.

I. **Wifi** (also **WiFi**, **Wi-fi** or **wifi**) is a brand originally licensed by the Wi-Fi Alliance to describe the underlying technology of wireless local area networks (WLAN) based on the IEEE 802.11 specifications.

Wi-Fi was intended to be used for mobile computing devices, such as laptops, in LANs, but is now often used for increasingly more applications, including Internet and VoIP phone access, gaming, and basic connectivity of consumer electronics such as televisions and DVD players. There are even more standards in development that will allow Wi-Fi to be used by cars in highways in support of an Intelligent Transportation System to increase safety, gather statistics, and enable mobile commerce IEEE 802.11p.

A person with a Wi-Fi device, such as a computer, telephone, or personal digital assistant (PDA) can connect to the Internet when in proximity of an access point. The region covered by one or several access points is called a hotspot. Hotspots can range from a single room to many square miles of overlapping hotspots. Wi-Fi can also be used to create a Wireless mesh network. Both architectures are used in Wireless community network, municipal wireless networks like Wireless Philadelphia [1], and metro-scale networks like M-Taipei [2].

Wi-Fi also allows connectivity in peer-to-peer mode, which enables devices to connect directly with each other. This connectivity mode is useful in consumer electronics and gaming applications.

When the technology was first commercialized there were many problems because consumers could not be sure that products from different vendors would work together. The Wi-Fi Alliance began as a community to solve this issue so as to address the needs of the end user and allow the technology to mature. The Alliance created another brand "Wi-Fi CERTIFIED" to denote products are interoperable with other products displaying the "Wi-Fi CERTIFIED" brand.

A. History

Wi-Fi uses both single carrier direct-sequence spread spectrum radio technology, part of the larger family of spread spectrum systems and multi-carrier OFDM (Orthogonal Frequency Division Multiplexing) radio technology. Unlicensed spread spectrum was first authorized by the Federal Communications Commission in 1985 and these FCC

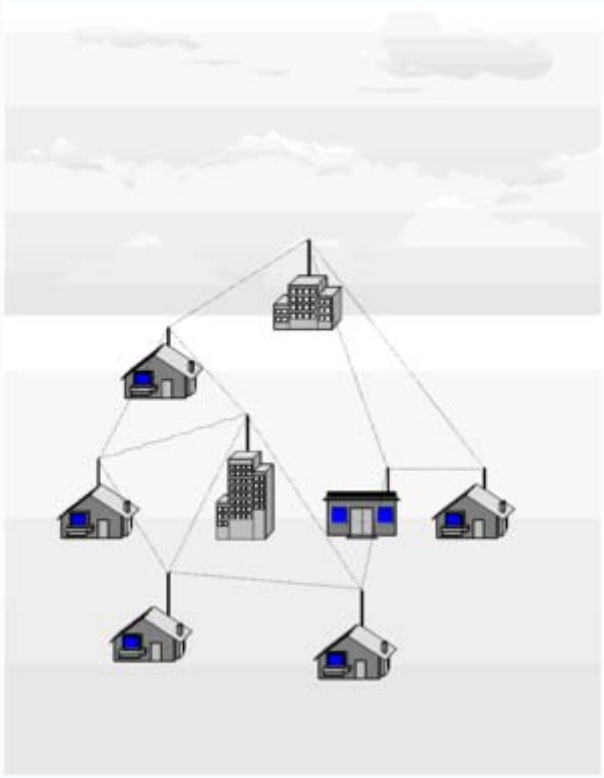
regulations were later copied with some changes in many other countries enabling use of this technology in all major countries. These regulations then enabled the development of Wi-Fi, its onetime competitor HomeRF, and Bluetooth.

The precursor to Wi-Fi was invented in 1991 by NCR Corporation/AT&T (later Lucent & Agere Systems) in Nieuwegein, the Netherlands. It was initially intended for cashier systems; the first wireless products were brought on the market under the name WaveLAN with speeds of 1 Mbit/s to 2 Mbit/s. Vic Hayes, who was the primary inventor of Wi-Fi and has been named the 'father of Wi-Fi,' was involved in designing standards such as IEEE 802.11b, 802.11a and 802.11g. In 2003, Vic retired from Agere Systems. Agere Systems suffered from strong competition in the market even though their products were high quality, as many opted for cheaper Wi-Fi solutions. Agere's 802.11a/b/g all-in-one chipset (code named: WARP) never made it to market, and Agere Systems decided to quit the Wi-Fi market in late 2004.

B. Wi-Fi: How it works

The typical Wi-Fi setup contains one or more Access Points (APs) and one or more clients. An AP broadcasts its SSID (Service Set Identifier, "Network name") via packets that are called beacons, which are broadcast every 100 ms. The beacons are transmitted at 1 Mbit/s, and are of relatively short duration and therefore do not have a significant influence on performance. Since 1 Mbit/s is the lowest rate of Wi-Fi it assures that the client who receives the beacon can communicate at least 1 Mbit/s. Based on the settings (e.g. the SSID), the client may decide whether to connect to an AP. Also the firmware running on the client Wi-Fi card is of influence. Say two APs of the same SSID are in range of the client, the firmware may decide based on signal strength to which of the two APs it will connect. The Wi-Fi standard leaves connection criteria and roaming totally open to the client. This is a strength of Wi-Fi, but also means that one wireless adapter may perform substantially better than the other. Since Wi-Fi transmits in the air, it has the same properties as a non-switched ethernet network. Even collisions can therefore appear like in non-switched ethernet LAN's.

C. Wireless mesh network



D. Wireless mesh networking is mesh networking implemented over a Wireless LAN.

This type of Internet infrastructure is decentralized, relatively inexpensive, and very reliable and resilient, as each node need only transmit as far as the next node. Nodes act as repeaters to transmit data from nearby nodes to peers that are too far away to reach, resulting in a network that can span large distances, especially over rough or difficult terrain. Mesh networks are also extremely reliable, as each node is connected to several other nodes. If one node drops out of the network, due to hardware failure or any other reason, its neighbours simply find another route. Extra capacity can be installed by simply adding more nodes. Mesh networks may involve either fixed or mobile devices. The solutions are as diverse as communications in difficult environments such as emergency situations, tunnels and oil rigs to battlefield surveillance and high speed mobile video applications on board public transport or real time racing car telemetry.

The principle is similar to the way packets travel around the wired Internet — data will hop from one device to another until it reaches a given destination. Dynamic routing capabilities included in each device allow this to happen. To implement such dynamic routing capabilities, each device needs to communicate its routing information to every device it connects with, "almost in real time". Each device then determines what to do with the data it receives — either pass it on to the next device or keep it. The routing

algorithm used should attempt to always ensure that the data takes the most appropriate (fastest) route to its destination.

The choice of radio technology for wireless mesh networks is crucial. In a traditional wireless network where laptops connect to a single access point, each laptop has to share a fixed pool of bandwidth. With mesh technology and adaptive radio, devices in a mesh network will only connect with other devices that are in a set range. The advantage is that, like a natural load balancing system, the more devices the more bandwidth becomes available, provided that the number of hops in the average communications path is kept low.

To prevent increased hop count from canceling out the advantages of multiple transceivers, one common type of architecture for a mobile mesh network includes multiple fixed base stations with "cut through" high-bandwidth terrestrial links that will provide gateways to services, wired parts of the Internet and other fixed base stations. The "cut through" bandwidth of the base station infrastructure must be substantial for the network to operate effectively. However, one feature of wireless mesh networks is that an operator need only deploy a minimal base station infrastructure, and allow the users themselves to extend the network.

Since this wireless Internet infrastructure has the potential to be much cheaper than the traditional type, many wireless community network groups are already creating wireless mesh networks.

II. **WiMAX** is defined as **W**orldwide **I**nteroperability for **M**icrowave **Acc**ess by the WiMAX Forum, formed in April 2001 to promote conformance and interoperability of the standard IEEE 802.16, also known as WirelessMAN. The Forum describes WiMAX as "a standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable and DSL".

The WiMAX Forum is "the exclusive organization dedicated to certifying the interoperability of BWA products, the WiMAX Forum defines and conducts conformance and interoperability testing to ensure that different vendor systems work seamlessly with one another." Those that pass conformance and interoperability testing achieve the "WiMAX Forum Certified" designation and display this mark on their products and marketing materials. Vendors claiming their equipment is "WiMAX-ready", "WiMAX-compliant", or "pre-WiMAX" are not WiMAX Forum Certified, according to the Forum.

A. Introduction

WiMAX is a term coined to describe standard, interoperable implementations of IEEE 802.16 wireless networks, in a rather similar way to Wi-Fi being interoperable implementations of IEEE Wireless LAN standard 802.11. However, WiMAX is very different from Wi-Fi in the way it works.

In Wi-Fi, the media access controller (MAC) uses contention access — all subscriber stations wishing to pass data through an access point (AP) are competing for the AP's attention on a random basis. This can cause distant nodes from the AP to be repeatedly interrupted by closer nodes, greatly reducing their throughput. And this makes services such as VoIP or IPTV which depend on a determined level of quality of service (QoS) difficult to maintain for large numbers of users.

In contrast, the 802.16 MAC is a scheduling MAC where the subscriber station only has to compete once (for initial entry into the network). After that it is allocated a time slot by the base station. The time slot can enlarge and contract, but it remains assigned to the subscriber station, meaning that other subscribers can not use it. This scheduling algorithm is stable under overload and over-subscription (unlike 802.11). It can also be more bandwidth efficient. The scheduling algorithm also allows the base station to control Quality of Service by balancing the assignments among the needs of the subscriber stations.

The original WiMAX standard, IEEE 802.16, specified WiMAX in the 10 to 66 GHz range. 802.16a, updated in 2004 to 802.16-2004 (also known as 802.16d), added support for the 2 to 11 GHz range. 802.16d was updated to 802.16e in 2005. 802.16e uses scalable OFDM as opposed to the non-scalable version in .16d. This brings potential benefits in terms of coverage, self installation, power consumption, frequency re-use and bandwidth efficiency. .16e also adds a capability for full mobility support.

Most interest will probably be in the 802.16d and .16e standards, since the lower frequencies suffer from lower attenuation and therefore give improved range and in-building penetration.

The WiMAX specification improves upon many of the limitations of the Wi-Fi standard by providing increased bandwidth and range and stronger encryption. It provides connectivity between network endpoints without direct line of sight in favorable circumstances. The non-line of sight (NLOS) performance requires the .16d or .16e variants, since the lower frequencies are needed. It relies upon clever use of multi-path signals.

B. Uses for WiMAX

A commonly held misconception is that WiMAX will deliver 70 Mbit/s, over 70 miles at 70 mph. Each of these may be true individually, given ideal circumstances, but they are not simultaneously true. WiMAX has some similarities to DSL in this respect, where one can either have high bandwidth or long reach, but not both simultaneously. The other feature to consider with WiMAX is that the bandwidth is shared between users in a given radio sector, so if there are many active users in a single sector, each will get reduced bandwidth.

The bandwidth and reach of WiMAX make it suitable for the following potential applications:

- Connecting Wi-Fi hotspots with each other and to other parts of the Internet
- Providing a wireless alternative to cable and DSL for last mile (last km) broadband access.
- Providing high-speed mobile data and telecommunications services

C. Broadband Access

Many cable and traditional telephone companies are closely examining or actively trialing the potential of WiMAX for "last mile" connectivity. This could result in better price-points for both home and business customers as based on the benefits of competition. In areas without preexisting physical cable or telephone networks, WiMAX could allow broadband access that has hitherto been unavailable. Home units the size of a paperback book that provide both phone and network connection points are already available and easy to install.

D. Mobile applications

There is potential for using WiMAX with legacy cellular networks. WiMAX antennas can "share" a cell tower without compromising the function of cellular arrays already in place. Companies that already own cell sites in widespread service areas have a unique opportunity to diversify. Some cellular companies are evaluating WiMAX as a means of increasing bandwidth for a variety of data-intensive applications. In line with these possible applications is the technology's ability to serve as a high bandwidth "back-haul" for Internet or cellular phone traffic from remote areas back to a backbone. Although the cost-effectiveness of WiMAX in a remote application will be higher, it is definitely not limited to such applications, and may in fact be an answer to reducing the cost of of T1/E1 back-haul as well. Given developing countries' (such as in Africa) limited wired infrastructure, the costs to install a WiMAX station in conjunction with an existing cellular tower or even as a solitary hub are likely to be small in comparison to developing a wired solution. The wide, flat expanses and low population density of such an area lends itself well to WiMAX and its range. For countries that have skipped wired infrastructure as a result of inhibitive costs and unsympathetic geography, WiMAX can enhance wireless infrastructure in an inexpensive, decentralized, deployment-friendly and effective manner.

THE BENEFITS AND RISKS OF BROADBAND SYSTEMS

A WiFi system is intended to provide a "wireless" option to make available broadband throughout a community and is generally considered a low cost option. Broadband, high speed internet access, is also becoming increasingly possible (the triple play) by subscription to the local cable and telecommunications operator. However, their services may not necessarily meet local needs and interests and are not portable (available) from any location throughout a community like a wireless WiFi system is capable of.

I. THE BENEFITS OF PUBLIC BROADBAND SYSTEMS

A. Access to advanced communications services vital to economic growth, educational opportunity, affordable health care and quality of life

B. In the foreseeable future, the private sector will not offer more than a handful of communities outside dense population centers sufficiently robust communications services to spur economic development.

C. By owning its own network, a community maximizes its ability to

1. control the types, quality, reliability, timing and location of communications services deployed in the community

2. ensure that services will be available to the community at the lowest possible price

3. promote universal access and interconnectivity

4. enhance the community's economic development, educational opportunity and quality of life

5. minimize disruption to public property and maximize efficient use of public rights of way

6. improve government efficiency and communication with the public

7. enhance the local government's revenues from, and decrease its external expenditures for, communications services

8. spur incumbent providers to lower prices and improve quality of service

9. amounts saved will remain in the community, where they will typically recycle four or more times

D. A credible threat of municipal entry may be sufficient to cause significant changes in an incumbent's performance.

E. Communities that operate their own electric utilities are particularly well-suited to operate their own broadband systems

1. Same technological, demographic, economic forces at work as those existing in the early stages of the electric power industry. *See* J. Baller & S. Stokes, "The Public Sector's Authority to Engage in Telecommunications Activities" (April 1999), available at http://www.baller.com/library-articles.html.

2. 75% of America's public power utilities serve communities with less than 10,000 residents. In the next 3-5 years, public power utilities may be the only viable provider of advanced communications services in many of these communities

3. Public power utilities are "anchor tenants" that substantially reduce the financial risks of the building and operating public communications networks

4. Public power utilities have more than a century of experience in providing sophisticated, technologically-complex services, billing and supporting customers of all kinds, and furnishing universal service

5. Need to survive in decontrolled and restructured electric power industry against competitors that can bundle energy and telecommunications services.

II. BURDENS AND RISKS OF PUBLIC BROADBAND SYSTEMS

A. Financial

1. Costs – construction, operations and maintenance

2. Revenues – need relatively high penetration rates

3. Unavailability of suitable financing at all stages

4. Restrictions on financing

5. Costs of combating challenges by incumbents (legislative and judicial)

B. Technological

1. Changing technologies – complete obsolescence or enough competition to cut penetration below necessary levels

   a. the longer the payback period needed to reach success, the greater the likelihood of pressures from new or improved technologies

   b. include all technologies, e.g., improved performance (DSL for wireline and DOCSIS 2 and beyond for cable), WiFi, WiMax, fixed terrestrial and satellite wireless, Ultra Wide Broadband

   c. electric power lines – Manassas, VA

2. Economies of technological scale – local vs. regional, national or international operations

3. Need for expertise in multiple areas

C. Marketing

1. Government entities generally lack communications marketing expertise

2. National brands vs. local identity

3. Bundling of cable, local and long distance telephone, Internet, etc.

   a. value of whole package may offset deficiencies in any individual area – e.g., poor cable service

   b. economies of scale in operations, bulk purchasing, borrowing, advertising, etc.

4. Deep cost cutting by incumbents

D. Political

1. Deep philosophical differences – e.g., private enterprise v. local self-help

2. Regional differences

3. Major incumbents have vast political clout with Congress, many state legislatures

E. Legal – see next section

AUTHORITY TO PROVIDE COMMUNICATIONS SERVICES

I. FEDERAL LAW ENCOURAGES BUT DOES NOT AUTHORIZE MUNICIPAL PROVISION OF COMMUNICATIONS SERVICES

Federal law encourages public entities to provide communications services of all kinds, but it does not affirmatively empower them to do so.

With respect to telecommunications services, Section 253(a) of the Telecommunications Act, 47 U.S.C. § 253(a), states:

> No state or local statute or regulation or other state or local legal requirement may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.

Despite the broad sweep of this language, the Supreme Court of the United States held in *Jeremiah W. (Jay) Nixon v. Missouri Municipal League*, 541 U.S. 125, 541 S.Ct.125 (2004), that the term "any entity" in Section 253(a) does not cover public entities. The Court found that Congress had not expressed its intent clearly enough in Section 253(a) to meet the Court's extraordinarily high standards for finding federal preemption of traditional state powers. The Court stressed, however, that its decision "[did] not turn on the merits of municipal telecommunications services" and that, as a matter of public policy, municipalities have "at the very least a respectable position, that fencing governmental entities out of the telecommunications business flouts the public interest." *Nixon*, 124 S.Ct. at 1560. The Court also noted that the FCC had "denounced the policy behind the Missouri statute;" that Chairman William Kennard and Commissioner Gloria Tristani had "minced no words in saying that participation of municipal entities in the telecommunications business would 'further the goal of the 1996 Act to bring the benefits of competition to all Americans, particularly those who live in small and rural communities in which municipally-owned electric utilities have great competitive potential.'"

Similarly, in the cable area, Section 613(e)(1) of the Communications Act, 47 U.S.C. § 533(e)(1), states that a "franchising authority may hold any ownership interest in any cable system." The term "franchising authority," in turn, is defined in Section 602(10) of the Act, 47 U.S.C. § 522(10), as "any governmental entity empowered by Federal, state or local law to grant a franchise." Thus, one could reasonably read the Act as authorizing any local government to provide cable television service. The courts have read this language as merely "permissive rather than empowering" – *i.e.*, the language does not furnish a federal grant of authority to provide cable service. *See, e.g., Time Warner Communications Inc. v. Borough of Schuylkill Haven*, 784 F. Supp. 203, 213 (E.D. Pa. 1992).

With regard to high-speed Internet access (often referred to as "broadband"), there is widespread consensus among the Bush Administration, Congress, the States, local governments, incumbent and new cable and telecommunications providers, and virtually all other stakeholders, on the point that federal law should be interpreted so as to encourage the deployment of broadband communications services and capabilities nationwide as rapidly as possible.

The national goal of rapid and ubiquitous deployment of broadband is reflected in various sections of the Communications Act. For example, Section 706(a), requires the Federal Communications Commission (FCC) and the States to "encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) by utilizing, in a manner consistent with the public interest, convenience, and necessity, price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment."

Similarly, Section 706(b) requires the FCC to determine annually whether "advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion," and if the FCC's determination is negative, to "take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market." Congress also declared in Section 254(b)(3) the national policy that "Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas."

Furthermore, Section 230(b) of the Communications Decency Act of 1996 states that

> It is the policy of the United States—
> (1) to promote the continued development of the Internet and other interactive computer services and other interactive media;
> (2) to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation;
> …

Relying upon this statement, a federal district court issued a permanent injunction prohibiting a state from attempting to regulate even traditional telephone service when provided over Internet Protocol:

> Congress has spoken with unmistakable clarity on the issue of regulating the Internet: "It is the policy of the United States . . . to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation." 47 U.S.C. § 230(b); *see also Southwestern Bell Tel. Co. v. FCC*, 153 F.3d 523, 544 (8th Cir. 1998) (concluding that, based on Congress's intent to leave Internet unregulated, ISPs should be excluded from the imposition of interstate access charges); *Zeran v. America Online, Inc.*, 129 F.3d 327, 330 (4th Cir. 1997) (recognizing that "Congress acted to keep government regulation of the Internet to a minimum").

Vonage Holdings Corp. v. Minn. PUC, 290 F.Supp.2d 993 (D. Minn. 2003), *aff'd on other grounds*, 394 F.3d 568 (8th Cir. 2004).

Nevertheless, the broad national consensus on encouraging Internet-based services is suggestive only. As with telecommunications and cable services, no federal law affirmatively authorizes local governments to provide high-speed Internet access service.

II. POSSIBLE CHANGES IN FEDERAL LAW REGARDING MUNICIPAL PARTICIPATION

Both Houses of Congress have been actively engaged this year in the development of comprehensive communications legislation aimed at speeding the deployment of broadband. While much of the focus of the debate has been on the properly regulatory treatment of new video and broadband offerings by incumbent telephone companies and on the subject of "network neutrality," both of the leading bills in the House and the Senate contain specific measures preempting state prohibitions on municipal entry into broadband.[1] However, given the fact that it is already mid-summer of an election year, it is not clear whether a bill can realistically be adopted this year.

III. STATE LAWS AFFECTING THE AUTHORITY OF PUBLIC ENTITIES TO PROVIDE COMMUNICATIONS SERVICES

A. Dillon's Rule States

1. Under "Dillon's Rule,"[2] the authority of a municipality is strictly construed to include only those powers that the state's constitution or legislature have expressly granted to it or that are necessarily implied or incidental to powers expressly granted.

2. In some states, the rule is codified, and in others it is judge-made. Occasionally, a state has both codified and judge-made versions that are in apparent conflict (e.g., South Carolina).

3. Where the rule exists, silence is generally construed against public authority to provide communications services.

4. If a government entity is in a Dillon's Rule state, one must, if possible, justify the specific communications activity in question as a reasonable extension of a power otherwise granted.[3]

---

[1] In the House it is "The Communications Opportunity, Promotion, and Enhancement Act of 2006," HR.5252, sponsored by Reps. Barton, Rush, Upton and Pickering. In the Senate it is the "The Communications, Consumer's Choice, and Broadband Deployment Act of 2006," sponsored by Sen. Stevens (Committee Amendment 6-16-06) (S.2686) (Community Broadband begins at 110).

[2] Dillion's Rule is named for John Dillon, the chief judge of the Iowa Supreme Court who first articulated it in *Merriam v. Moody's Executors*, 25 Iowa 163, 170 (1868).

[3] For two examples of such analyses, see an opinion by the Attorney General of Ohio finding that vocational schools can purchase hardware and software for a system to provide Internet access to its students and then offer

B. "Home Rule" States

1. In "Home Rule" states, "home rule" or "charter" cities are generally deemed to be able to exercise any powers, and perform any functions, that are not expressly denied by the state's constitution or statutes or by the municipality's own Home Rule charter.

2. Many states – including Iowa itself -- have wholly or partially repudiated Dillon's Rule.

3. In Home Rule states, local governments have a great degree of autonomy and are often able to act in both a sovereign and a proprietary capacity.

4. **It is very important to understand exactly how a state's Home Rule provision works.** For example, in some states, only certain public entities are covered. Sometimes the state rule has presumptions that apply in certain situations but not others.[4] Some states have broad home rule language but the courts interpret the language narrowly.[5]

5. If a public entity would qualify for coverage by a state's constitutional or statutory Home Rule measure, one must ensure that the entity has followed, or will follow, all appropriate procedures necessary to take advantage of the measure.

C. State Measures

1. Some states have expressly granted local governments broad authority to provide communications services. *See, e.g.*, Ala. Code § 11-50B-3; Ariz. Rev. Stat. § 9-511(A), 9-514(A) (with voter approval); California Const., Article XI, Section 9(a) and Cal. Pub. Utilities Code § 10001; 54 Cal. Atty. Gen. Ops. 135 (1971) and Fla. Sat. Ch. XII, § 166.047; O.C.G.A. §§ 46-5-163(b) and 46-5-163(17) (Georgia);[6] Oregon Revised Statutes

---

Internet access for a fee to other entities and individuals. See http://www.ag.state.oh.us/opinions/1999/99-007.htm; and another opinion by the Attorney General of Ohio finding that a county's authority to incur debt for a telecommunications project can be derived from its authority to take actions to promote economic development and create jobs. http://www.ag.state.oh.us/sections/opinions/2004/2004%2D005.pdf.

[4] Opinion of the State of Washington Attorney General, AGO 2001-3. Although municipal corporations must have explicit or implicit authority, they enjoy a presumption in their favor.

[5] *See, e.g.*, Thomas S. Smith, *No Home on the Range for Home Rule*, 31 Land & Water L. Rev. 791 (1996).

[6] The Georgia Public Service Commission has held that the Georgia statute authorizes municipalities to offer telecommunications services without having to comply with various imputed-cost requirements that Bell South and the Cable Television Association of Georgia claimed to be necessary to create a "level playing field." *Order on Reconsideration Granting Interim Certificate of Authority With Conditions*, Docket No. 6329-U (September 3, 1996), *aff'd The Cable Television Association of Georgia, et. al v. Georgia Public Service Comm'n*, Case No. E-53464 (Ga. Super. Ct., May 19, 1997). The Commission has also held, however, that neither the Act nor MEAG's enabling legislation authorizes it to furnish telecommunications services. *Order*, Docket No. 7967-U (March 31,

§ 759.020; Va. Code § 15.2-2160 (competitive local exchange services) and § 56-484.7:1 ("qualifying communications services").

2. Some states authorize local governments to provide some services but not others:

   a. Missouri prohibits the state's political subdivisions from providing all telecommunications services and facilities other than services to telecommunications providers (under certain circumstances), services for internal use, services for medical and educational purposes, emergency services and "Internet-type" services. Revised Statutes of Missouri § 392.410(7).

   b. Tennessee bans municipal provision of paging and security service but allows provision of cable, two-way video, video programming, Internet and other "like" services only upon satisfying various anti-competitive public disclosure, hearing and voting requirements that a private provider would not have to meet. Tenn. Code Ann. § 7-52-601 *et seq*.

   c. Arkansas prohibits municipal entities from providing basic local exchange services, but not other telecommunications services. Ark. Code § 23-17-409

   d. Washington expressly authorizes Public Utility Districts to provide wholesale telecommunications services but not retail services. RCW § 54.16.330.

3. Some states have enacted outright prohibitions on municipal telecommunications activities. Examples follow:

   a. Texas bars municipalities and municipal electric utilities from offering telecommunications services or facilities directly or indirectly through private telecommunications providers. Texas Pub. Util. Code § 54.202 et seq.

   b. Arkansas prohibits municipalities from providing local exchange services. Ark. Code § 23-17-409.

   c. With certain limited exceptions, Nevada precludes cities with populations of 25,000 or more from offering any telecommunications services, as defined in the federal Telecommunications Act. Nevada Statutes § 268.086.

1998), *aff'd, Municipal Elec. Auth. of Georgia v. Ga. Pub. Serv. Comm'n*, 241 Ga. App. 237, 525 S.E.2d 399, 403 (1999), *cert. denied, Municipal Electric Authority of Georgia v. Georgia Public Service Comm'n* (Ga. 2000).

4. Some states have enacted measures that are not explicit prohibitions but impose burdens that are difficult, if not impossible, to meet. For example,

   a. Minnesota requires municipalities to obtain a 65% super-majority vote in order to provide telecommunications services. Minn. Stat. Ann. § 237.19.

   b. Massachusetts expressly authorizes cities and towns to provide communications services but impose onerous voting requirements. M.G.L., Ch. 164, Sections 34, 35 and 36.

   c. South Carolina allows public entities to provide telecommunications services subject to various imputed-cost requirements. S.C. Code § 58-9-2600.

   d. Utah authorizes municipalities to provide cable and telecommunications services, UT Code § 10-8-14, but if they choose to provide retail services, the Code subjects them to extremely onerous procedural requirements and substantive restrictions, UT Code § 10-18-101 *et seq*. (Law exempts provision of wholesale service to private providers and grandfathers arrangements in effect on March 1, 2001.) UT Code § 10-18-032 places restrictions on funding mechanisms for bonds but grandfathers municipalities that have taken action as of March 2004 (this grandfathers the member cities of UTOPIA).

   e. Virginia now allows localities to provide local exchange and other communications services, but subjects localities to various onerous burdens. Va. Code §§ 15.2-2160, 56-265.4:4. Additional burdens have been imposed with respect to cable service offerings.

   f. Florida allows municipalities to exercise home rule authority to provide telecommunications services, Fla. Const., Article VIII, § 2(b); Fla. Stat. Ch. XII, § 166.021(3) but imposes ad valorem taxes on municipal telecommunications services, Fla. Stat. Ch. XII, § 166.047. (Provision invalidated under Florida law in *City of Gainesville v. Zingale*, CA No. 2000-CA-00 1582 (Cir. Ct. 2d Cir., Leon Co., March 20, 2002), *aff'd, Dep't of Revenue v. City of Gainesville,* 859 So.2d 595 (Fl. Dist. Ct. App., 1st Dist 2003), *appeal pending, Dep't of Revenue v. City of Gainsville,* No. SC 03-2273 (Fla. S.Ct.)

   g. Wisconsin imposes burdens on municipal communications providers not imposed on nongovernmental providers. Generally, it requires municipalities to conduct a feasibility study and hold a public hearing prior to providing telecom, cable, or Internet

services. It also prohibits "subsidization" of most cable and telecom services and prescribes minimum prices for telecom services. Wis. Stat. §§ 196.203-04; 66.0419, 66.0422.

h. Pennsylvania requires that municipalities obtain the approval of the incumbent provider before offering competitive communication services. If the incumbent promises to provide a comparable service within 12 months, the municipality is prohibited from moving forward. If the incumbent fails to respond adequately, the municipality is free to proceed. 66 Pa. C.S. §§ 3001-09.

5. Several state legislatures recently considered new restrictions on public communications providers the vast majority o these were rejected. For a list of current state restrictions go to www.Baller.com

6. Others considered, or are considering, measures to decontrol incumbent activities

7. If state law authorizes or permits public communications projects, be sure to comply with or challenge relevant procedural requirements. For example,

8. Recent trend in new state legislation – "fair competition" requirements

a. In response to a proposed fiber to the home system by Lafayette Utilities Services (and opposition by Cox and BellSouth), the State of Louisiana recently enacted a compromise law (SB 877) that imposes certain requirements on potential municipal providers, and that protects them in certain ways:

i. Feasibility study. The feasibility study must show, for all communications services *as a group*, that revenues will exceed costs over the life of the bonds, in an amount sufficient to cover the bond obligations.

ii. Municipal providers' commercially-sensitive information is protected.

iii. Municipalities may use existing referendum procedures. If none, then must use procedures set forth in SB 877.

iv. Municipalities can fund "startup costs" from other sources.

v. Municipalities can make inter-utility loans, similar to private-sector inter-affiliate transfers, subject to rules under development by LPSC.

vi. Municipalities can pledge resources of other utility services to obtain favorable interest rates, terms and conditions.

vii. Municipalities can use revenue from sales of all communications services to repay bonds.

viii. Municipalities must set prices high enough to cover direct, indirect, and imputed costs.

ix. SB 877 explicitly gives municipalities the right to bundle services, and use any other business practice that a private sector provide may employ.

b. Some states have enacted "imputed cost" requirements – e.g., Louisiana, Missouri, South Carolina, Utah, and Virginia

i. How impute costs? Who's comparable? How obtain data? (*See* Georgia Public Service Commission brief in Marietta FiberNet case).

ii. If imputing requirements read to require raising prices, they are fundamentally anticompetitive and contrary to the public interest

c. *See* T. Hazlett and G. Ford, *The Fallacy of Regulatory Symmetry: An Economic Analysis of 'the Level Playing Field' in Cable TV Franchising Statutes*, 3 Business and Politics 21, 43 (2001), http://www.manhattan-institute.org/hazlett/the_fallacy_of_regulatory_symm.pdf

9. Who regulates? What is regulated?

a. State public service commissions increasingly involved in determining initial qualifications – e.g., Georgia, Iowa, Utah, Virginia,

b. Some states also regulate compliance with "fair competition" requirements – e.g. Georgia, Utah, Virginia

D. Local Restrictions

1. Local ordinances, charters, franchises, pole agreements, bond restrictions, contracts, etc., may contain explicit or implicit barriers to entry. **Review these carefully**.

2. For example, the City of Alameda, CA, had a charter provision that precluded it from establishing any new utilities without a 2/3 vote of the electors – a practical impossibility. The City was able to, and did, eliminate the charter provision by a simple majority vote.

IV. LOCAL LEGAL ISSUES

A. City or utility charter provisions

B. Local ordinances and resolutions

C. Local cable and telecommunications franchises

D. Local zoning requirements, including tower siting ordinances

E. Easements

F. Contracts

G. Bond instruments

INVOLVEMENT MODELS AND STRUCTURES

A. Public communications projects have come in many shapes and forms; some of these involvement models can be applied to WiFi as well as fiber (wireline) municipal projects

B. Examples

1. Publicly-created, independent communications entity – e.g., Memphis Networx

2. Public communications services only to government and educational users – e.g., Portland Integrated Regional Network Enterprise (OR); Milwaukee (WI); many others

3. Publicly-owned communications utility providing only wholesale services to retail providers – e.g., NOANet (WA and OR)

4. Publicly-owned communications utility providing retail services to public – e.g., Bristol (VA); Kuztown (PA); Tacoma (WA); Ashland (OR); Cedar Falls (IA); Glasgow (KY); Chaska (MN); Moorehead (MN); scores of others

5. Non-profit entity – e.g., Corpus Christi, Georgia Public Web, Philadelphia Wireless.

6. Strategic partnership with private sector – e.g., Corpus Christi (TX); Philadelphia (PA); Hawarden (IA) (with LongLines and NIPSCO); LaGrange (GA) (with Charter); Shawnee (KS) (Shawnee Municipal Authority, Com Solutions and Systems Inc., and the Oklahoma Municipal Services Corporation)

7. Lease of municipal facilities to private-sector provider – e.g., Anaheim (CA)

8. Construction and sale of municipal facilities to private sector provider – e.g., Lynchburg (VA) (sold $3.5 million 42-mile fiber-optic network to CFW Communications (now nTtelos) for $1 and, in return, received (a) 30-year irrevocable right to use all of the fibers it had previously been using; (b) 8 fibers on all new routes in City; (c) Cow's agreement to offer broadband service to 95% of addresses in City within 4 years; (d) the best telephone rates in Virginia for 10 years; (e) hundreds of thousands of dollars worth of technical assistance and equipment discounts, (f) various other benefits).

9. Regional entities – e.g., Oregon Central Coast Economic Development Alliance; UTOPIA project in Utah; proposed Tri-Cities project in Illinois; *eCorridor* Project in Virginia; SweetNet County, WY; Rural MD. (NB: *see GTE Northwest, Inc. v. Oregon Public Utility Comm'n*, 39 P.3d 201 (Or.App. 2002), on a county's authority to provide extraterritorial telecommunications services.)

10. Demand aggregation – e.g., Chicago CityNet (IL); BerkshireConnect (MA); Stillwater (OK).

11. Some major communities currently evaluating WiFi municipal initiatives includes – San Francisco (CA); Minneapolis (MN); and Seattle (WA).

C. In structuring involvement models and using facilities developed for other purposes in the past, it is particularly important to consider tax implications (e.g., public/private partnerships are likely to qualify as "private use" for federal tax purposes, thus removing potential tax advantages)

OTHER CONSIDERATIONS

A. Predatory pricing and other anticompetitive conduct by incumbents – s*ee, e.g.*, Scottsboro (AL) Power Board filings and FCC response at http://www.baller.com/library-comments.html; *see also* NATOA's testimony to Senate Judiciary Committee, attaching extensive Baller Herbst analysis of anticompetitive practices of cable incumbents, http://judiciary.senate.gov/hearing.cfm?id=1041; *see In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, MB Docket No. 04-227, Notice of Inquiry, (rel. June 17, 2004), *Comments of the National Association of Telecommunications Officers and Advisors and the Association for Community Media*,(filed July 23, 2004)(available online at: http://www.natoa.org/public/articles/NATOA-ACM_Comments_No._04-227_(07-23-04).pdf

B. Access to essential facilities and programming – *see, e.g.*, APPA's comments to the FCC on exclusive contracts for programming, http://www.baller.com/library-comments.html; *see also In The Matter of Implementation of The Cable Television Consumer Protection and Competition Act of 1992, Development of Competition and Diversity in Video Programming Distribution, Section 628(c)(5) of the Communications Act Sunset of Exclusive Contract Prohibition, Report and Order*, at ¶ 7, 17 FCC Rcd. 12,124, 2002 WL 1396090 (rel. June 28, 2002); *see In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, MB Docket No. 04-227, Notice of Inquiry, (rel. June 17, 2004), *Comments of the National Association of Telecommunications Officers and Advisors and the Association for Community Media*,(filed July 23, 2004)(available online at: http://www.natoa.org/public/articles/NATOA-ACM_Comments_No._04-227_(07-23-04).pdf

C. Access to customers, particularly in multi-user settings – *see In the Matter of Telecommunications Services Inside Wiring …*, CS Docket No. 95-184, MM Docket No. 92-260,, *First Order on Reconsideration and Second Report and Order* at ¶ 71 (rel. January 29, 2003), at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-9A1.doc.

D. "Level Playing Field" issues – *see, e.g.*, state statutes, cases and analysis of these issues in City of Louisville briefs and court decisions at http://www.baller.com/library-comments.html.

E. Incumbents may attempt to resurrect arguments they lost in early legal challenges to municipal systems

1. Inside wiring issues – *e.g.*, Glasgow, KY, dealt successfully with such issues in litigation in late 1980s and early 1990s, and then Congress codified protections in Cable Act Amendments of 1992. The FCC recently stated that the inside wiring rules apply to all multichannel video

programming distributors (MVPDs) in the same manner. In essence, the order maintains the status quo, reaffirming the contract-oriented rules governing home run wiring, inside wiring and MDUs. *First Order On Reconsideration And Second Report and Order, Cable Inside Wiring*, CS Docket No. 95-184; MM Docket No. 92-260, (rel. January 29, 2003), at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-9A1.doc.

2. Antitrust issues – *e.g.*, City of Paragould, AR, dealt successfully with such issues in *Paragould Cablevision, Inc. v. City of Paragould*, 930 F.2d 1310 (8th Cir. 1991).

3. "Public purpose" issues – *e.g.*, City of Morganton, NC, dealt with such issues successfully in *Madison Cablevision, Inc. v. City of Morganton, NC*, 325 N.C. 634, 386 S.E.2d 200 (1989).

PLANNING

Planning and evaluation of issues will need to be initiated by local government. We suggest a committee be designated to consider the following. This section is only intended to be illustrative of what should be considered. It is very important, because of a wide range in differences in community size, goals, budgets, etc., to create a planning process that best matches a particular community.

I. GENERAL CONSIDERATIONS

A. Legal authority and limitations

B. Local needs

C. Purpose of municipal WiFi or other broadband initiative

D. Ownership and operation model, i.e. municipal, public, private partnership, private

E. Digital inclusion priorities (overcoming digital divide)

F. Physical build out – who will perform?

1. City

2. Private contractors

3. Other public contractors

4. City created non-profit corporation?

G. Management of system – who will perform?

1. Need to develop process to determine of who will manage system.

2. Non-profit corporation?

H. How do you manage system to serve needs of all, keep it safe, and keep it operational?

I. Financial Issues -- Need economic analysis, what is going to be needed to build and maintain this system?

J. Legal and technical consulting requirements

II. SERVICE CONCEPTS.

It is anticipated that during the planning stage it will be essential to identify and describe potential expectations of the City. This may include at least the following:

A. Government services:

1. Inter-City services, including emergency and non-emergency services, communications for inspectors, police, fire, and emergency services

2. Traffic control – wireless camera connectivity services

3. Broadcasting services, including emergency broadcast

4. Parking enforcement, community surveillance, and other

5. Waste Water

6. Fleet management

B. Residential services:

1. High-speed broadband connectivity

2. Mobile high-speed broadband connectivity

C. Business services:

1. High-speed broadband connectivity

2. Mobile high-speed broadband connectivity

3. Video conferencing

4. Other

D. Community development services:

1. Informational services – for example, to tourists

2. Interactive community meeting capabilities

3. Economic developments services and visitor amenity services

The above is simply a brief overview of some of the possibilities and it is very likely that this will be considerably expanded.

III. OVERVIEW OF CITY MARKET AND ENVIRONMENT.

Information gathering will develop a record to support decisions and recommendations of the City, provide a clear picture of where things stand in the City in terms of communication service capabilities, identify assets in the City including current telecommunications infrastructures, wireless, and fiber optic networks, and other information illustrating the market potential and current and future service needs.

The following is an outline of information gathering to consider:

A. Overview of commercial and industrial businesses in the City.

B. Description of the community's residents and the makeup of the community residents.

C. Age categories.

D. Income categories.

E. Educational level.

F. Business growth and/or population projections.

G. Past and future planning, including vision plans of the City.

H. Major community assets, including museums and other attractions.

I. Major public institutions (a map showing the location):

1. City, county, and state government buildings.

2. Universities and colleges.

3. Public and private schools.

4. Convention centers.

5. Libraries.

6. Hospitals.

7. Other.

J. Publicly owned infrastructures:

1. Roads.

2. Fiber networks.

3. Other.

K. Private infrastructures:

1. Existing Wi-Fi systems, fiber or other types of telecommunications and cable television infrastructures. For each of these, if there are franchises or licenses, a file or record should be available for easy access.

L. A competitive commercial and retail networks.

M. Cable, telecommunications, and/or other forms of communication capabilities offered on a retail basis or commercial basis to business and/or residents.

N. Basic research should also include analysis of retail prices and products offered in the market, household products and prices available, and analysis of the business community and needs.

O. Market surveys. Potential surveys include:

1. Separate survey for business and/or residents.

2. Survey of community and government leaders.

3. Other.

P. Military installations, description of any networks or links.

1. Other.

IV. APPROACH TO STUDY.

A. Create a Committee to recommend a broadband vision plan for the community. The Committee may use a consultant to provide consulting assistance and legal services and general guidance throughout the Committee process. A high level technical consultant should perform a study and coordinate and work together with the Committee and its consultant, which will lead to a recommended broadband development option for consideration and approval by the community.

B. Explore possible ownership models, including sole ownership, partnership with others, including other municipalities or independent private entities. As part of this, it will be essential to create an anticipated budget necessary not only for the cost of the network, but also ongoing operation and maintenance.

C. Based on information and planning process develop an implementation plan. The implementation plan will include a detailed description of all steps that may be required to lead to the development and completion of a network, operation, maintenance, marketing and promotion and other essential requirements necessary as determined by the Committee. The implementation plan may also include preparation of a Request for Proposal, identification of potential third party responders and the criteria for selection.

CONCLUSION

This paper is intended to provide a preliminary legal analysis of the authority and options currently applicable to local governments regarding a broadband initiative. It is clear that there are a number of restrictions and limitations currently applicable based upon various state laws. While there may be change(s) in the future should Congress proceed to enact laws that preempt state barriers to municipal broadband, it is not at all clear when or whether such laws may be enacted. This paper, therefore, has been primarily focused on the ability of local governments to initiate a WiFi broadband project based on consideration of current applicable federal and state law and the importance of a through planning process.

There are a number of options to consider in order to achieve local objectives. It will be important for local governments to evaluate the options and to identify a workable model should a local government choose to proceed to implement or facilitate the development of a wireless (WiFi) broadband network.

This paper may or may not be exhaustive of all the considerations and possibilities, but should provide a basis upon which further discussions can take place to arrive at an approach that best suits the needs and requirements of a community.