

ADVANCED COMMUNICATIONS SERVICES; AN UPDATE

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Advanced communications services are coming at us fast and furious and the plethora of acronyms and abbreviations can be bewildering at times. This presentation is intended to provide an overview of the latest technologies being offered, summarize the hot topics of discussion at various levels, and provide an update and blow-by-blow description of happenings at the Texas Legislature. With the landscape changing on an almost daily basis, this paper may be outdated as soon as it is written and printed. However, the information is intended to give city attorneys who may not deal with these issues on a daily basis both some “talking points” at cocktail parties and an “alarm system” that will sound when the local telecommunications or cable provider walks in your door and says “Trust me, this will be good for your city.”

First, let's have some:

Scintillating Statistics and Titillating Tidbits

- One-half of all U.S. households will have broadband access by 2006, climbing to 75% by 2010. (Business 2.0, 4/28/05)
- DSL and passive optical-networking technologies will allow data transmission at the rate of 24 megabits/second – almost 6 times quicker than the fastest cable modem. Network speed should climb to 100 Mbps by 2006. (Business 2.0, 4/28/05)
- 1.9 million U.S. homes passed by Fiber to the Premises (“FTTP” – more on this later) in 2004 will become 11.8 million in 2009, or 10% of the 110 million homes in the U.S. (In-Stat research firm)
- As of September 2004, only 15% of homes passed by FTTP service were actually connected to it, and service was being marketed to less than one-half (½) of homes passed. (Render Vanderslice and Associates)

From the FCC's Reports on Local Telephone Competition and on High-Speed Internet Access Services, December 2004, as of June 2004, we learn the following:

- For 12 months ending June 30, 2004, CLEC end-user lines increased by 19%.
- End-user customers obtained local telephone service by utilizing approximately 148 million ILEC switched access lines, 32 million CLEC switched access lines, and 167 million mobile wireless telephone service subscriptions.
- Nationwide, mobile wireless telephone subscribers increased 7% during the first half of 2004 from 157 million to 167 million; for the full 12 month period ending June 30, 2004, mobile wireless subscribers increased by 13%.
- High-speed data lines connecting homes and businesses to the Internet increased by 38% during the 12 month period ending June 2004.

- Of the 32.5 million high-speed lines in service, 30.1 million served residential and small business subscribers, a 16% increase from 6 months earlier and a 46% increase for the 12 month period ending June 2004.
- High-speed connections over ADSL increased by 49% over the 12 month period; high-speed coaxial cable connections (cable modem) increased by 36%; the remaining 2.5 million connections are by satellite or wireless, wireline other than ADSL, and fiber high-speed connections.
- Advanced services lines (services at speeds exceeding 200 kbps in both directions) of all technology types increased by 44% - ADSL increased by 49% and cable modem connections increased by 47%.

Some parties predict that in the U.S., terrestrial cable and DSL services will dominate the broadband market for the foreseeable future, although as relatively mature technologies, they will grow more slowly than some of the newer access modes, like 3G wireless, Fiber to the Home (“FTTH”), satellite and fixed wireless.

From eMarketer, the following subscriber counts:

Subscribers (in millions)	2004	2008
Cable Modem	17.0	25.0
DSL	12.6	21.7
fixed wireless	2.2	6.0
FTTH	0.2	1.3
Satellite	0.4	1.12
mobile wireless (3G)	0.1	1.5
BPL	-	0.3
TOTAL	32.5	56.9

(www.eMarketer.com, 4/14/05)

Briefly, A Primer on the Technology Involved in Advanced Communications Services

What is Broadband?

Broadband refers most commonly to a new generation of high-speed transmission services that allow users to access the Internet at significantly higher speeds than traditional modems. There are generally six types of broadband access technologies:

- ✓ Hybrid Fiber Coax (“HFC”)
- ✓ Digital Subscriber Line (“DSL”)
- ✓ Fiber to the Home (“FTTH”)
- ✓ Wireless
- ✓ Broadband over Power Line (“BPL”)
- ✓ Satellite

The newest of these technologies will be briefly described and issues relating to their deployment will be explored.

What is UWB?

UWB, or Ultra Wide Band, spreads a data signal over a very wide portion of the frequency spectrum, offers high-speed data rates, consumes little power from batteries, and enables radios to fit within small-size devices. Plus, it's cool. It replaces cables among PCs, laptops, PDAs, cell phones, digital/video cameras, TV monitors, and has a short range (30 feet).

PAN is a Personal Area Network. This connects devices that are within close proximity to each other, such as PDAs, laptop computers, desk top computers, printers, scanners, faxes, and mice.

Bluetooth is a popular operator on the unlicensed, 2.4 Gbps band. You've seen people (and you may be one) who look as though they've been co-opted by the Borg – walking around with a device seemingly implanted in their skull and looping over their ear, talking into a tiny microphone. The technology that gets the signal from that Borg-ish attachment to the cell phone or Blackberry in their pocket is UWB, and probably provided by Bluetooth. The ideal application for UWB is in a home entertainment network (imagine being rid of all those wires), but Bluetooth is not yet fast enough for HDTV.

What is Wi-Fi?

The term “Wi-Fi” (short for “wireless fidelity”) refers to a handful of standards approved by industry groups that have made wireless networking inexpensive and nearly ubiquitous in the latest gadgets and computers. Operating in unlicensed spectrum, it transmits a signal up to 150 feet with 11-54 Mbps net throughput. Wireless data networking standards have been commercially available since the 1980's. Through several bankruptcies, the early providers of wireless data networking (remember Metricom's Ricochet system?) struggled to find their niche. Upon adoption of the standards for wireless local area networking (“WLAN”) in 1999, the market took off. The Wi-Fi market grew to \$1 billion annually by 2002, and sales are projected to keep growing.

The Wi-Fi standards use unlicensed radio spectrum to transfer data between devices, such as a laptop and a wireless-networking router. These standards are: 802.11b (first), 802.11a and 802.11g. These standards are set by the Institute of Electrical and Electronics Engineers (“IEEE”) and the Wi-Fi Alliance (an industry group responsible for interoperability testing).

What are the speeds?

- 802.11b offers top data transfer speed of 11 Mbps under optimal conditions, but typically achieves about half that rate in the real world.
- 802.11g and a top out at 54 Mbps, but generally perform at half the top speed.

What is WiMAX?

WiMAX is a wireless metropolitan area network (“MAN”) technology that will connect Wi-Fi hotspots to the Internet and provide a wireless extension to cable and DSL for the last mile broadband access. The standards are also established by the IEEE. WiMAX operates under IEEE 802.16. The standards provide up to 31 miles of linear service area range and allows users connectivity without a direct line of sight to a base station. It provides shared data rates up to 70 Mbps, which is supposedly enough bandwidth to simultaneously support more than 60 businesses with T1-type connectivity and well over a thousand homes at 1 Mbps DSL-level connectivity. This is often referred to as “Wi-Fi on

steroids.” It uses mainly 2 to 11 GHz bands, as opposed to the overcrowded 2.4 GHz band used by Wi-Fi.

This technology is similar to Wi-Fi, but makes wireless broadband Internet access directly available and is viewed as an alternative to high-speed cable and digital subscriber lines. Wi-Fi products create wireless networks allowing those who can connect to the networks to share resources, such as an Internet connection or a printer. WiMAX is essentially radio technology that promises to deliver two-way Internet access at speeds of up to 75 Mbps at long range. Its backers claim that WiMAX can transmit data up to 30 miles between broadcast towers and can blanket areas more than a mile in radius.

Are there any problems with WiMAX? The ability of every device on the network to pass on signals (“hopping”) means that some signals could be passed from one device to the next almost without limit. Each time the signal hops, some of the bandwidth drops away.

What’s a “Mesh”?

A Wi-Fi mesh uses Wi-Fi technology, but only connects to the Internet backbone through one or a few access points. The mesh is used to create a city-wide wireless network. Mesh networks have the potential to leapfrog conventional Wi-Fi, 3G cellular, and WiMAX networks by offering more complete coverage, faster speeds, greater reliability and easier deployment. And it’s cheaper. In a conventional wireless network, each client device (PDA or laptop) communicates directly with a cell tower or Wi-Fi base station. The cell tower has to be up and running, and the laptop has to be within range to send and receive signals. A mesh network works like the Internet. All the devices are peers of one another, able to send and receive Wi-Fi, WiMAX, or other wireless signals with any other device within range. Signals are sent from one device to the next until they reach an Internet access point (equivalent of a cell tower).

A mesh network is redundant – if one node or device stops working, or is bogged down with too much traffic, then data is simply routed around it. If more bandwidth is needed, it is easy to boost performance by dropping in new nodes when and where they are required. The Philadelphia plan is to blanket the city with 3,000 to 4,000 network nodes, which will cover 135 square miles with a Wi-Fi signal. Nodes will send signals to Internet access points sprinkled throughout the city that are either hardwired or use WiMAX to connect to the Internet, with an average data rate of 1 Mbps. It costs about \$20 per household to install a mesh in a neighborhood, compared to \$700 to \$1,000 per household to do a wired broadband network, such as DSL.

What is 3G?

This refers to “third-generation” technology, which can transmit a signal between 144 Kbps to 2 Mbps in cellular coverage areas. As a potentially international network, it will allow roaming and will provide access, by means of one or more radio links, to a wide range of telecommunications services supported by the fixed telecommunications networks and to other services that are specific to mobile users. A range of mobile terminal types will be encompassed, linking to terrestrial and/or satellite-based networks, and the terminals may be designed for mobile or fixed use. This technology will also be capable of determining the geographic position of mobiles and reporting it to both the network and the mobile terminal.

What do these technologies offer?

- Improved access to education resources for students, parents, and teachers.
- Equitable and efficient distribution of costly, wired high-speed Internet connections.
- Expansion of community resources, such as library facilities and technical expertise.
- Building the platform for future e-government initiatives; public health and social service knowledge building; civil society development, and community and individual expression and freedom of speech.¹
- Public safety:
 - ✓ In-car streaming video to allow real time surveillance from headquarters;
 - ✓ RFID tagging that wirelessly transmits from a firefighter's or police officer's uniform making him or her easy to track in an emergency;
 - ✓ Wireless cameras that monitor potential terrorist targets, high traffic intersections, high crime locations;
 - ✓ In-car connectivity that allows officers to send intelligence to headquarters over the Internet, complete "digital" paperwork and transmit it to the station.
- Intelligent transportation:
 - ✓ Wireless tracking devices to monitor public bus/subway locations and update schedule information kiosks at bus/subway stops;
 - ✓ Technology to remotely adjust traffic signal schedules based on traffic delays or emergency evacuation needs;
 - ✓ Wireless cameras that stream video of high traffic intersections and is then viewed by citizens on a website.
- Healthcare:
 - ✓ Wireless laptops that allow EMTs to check a patient's records via a wireless network from the patient's home or in transit to emergency room;
 - ✓ Use telemedicine to address lack of specialists in rural areas.²

¹ *Unlicensed Wireless Broadband Profiles; Community, Municipal & Commercial Success Stories*, by Matt Barranca, New America Foundation, Spectrum Policy Program, April 2004.

² *Wireless Broadband, the Foundation for Digital Cities; a Cookbook for Communities*, by Matt Stone, Civitium, LLC, September 2004.

Are any cities running Wi-Fi or WiMAX systems?

The lure of economic growth has been strong and has prompted numerous municipalities, both in Texas and across the country, to invest in broadband deployment, both wired and wireless. An interesting study was undertaken in Lake County, Florida, to determine whether the availability of a broadband network, provided by the local government, has actually resulted in the envisioned economic growth.³ In 2001, Lake County, Florida, began offering private businesses and municipal institutions access to an extensive, municipally-owned broadband network, with fiber optic connections to hospitals, doctor offices, private businesses, and schools. This study concluded that Lake County experienced approximately 100% greater growth in economic activity relative to comparable Florida counties since making the network available.

Another interesting study concludes that municipal networks (or even the threat of municipal entry) provide the competition necessary to keep rates low and quality of service high, that municipal systems increase investment in local communities, and that municipal systems do not preempt private providers (rather, the number of private providers increases as municipalities build their systems), that local governments do not favor themselves on taxes or rights-of-ways or otherwise compete unfairly with incumbent providers, and that municipal governments are up to the challenge of running complex broadband systems.⁴

Granbury, Linden, Elgin, Lockhart, Belton, Temple and Gunbarrel City in Texas have deployed municipal networks to provide citizen access that support economic development and improve the quality of life. Fort Davis has established a Wi-Fi network that serves the city and communities of Limpia Crossing and the Davis Mountains Resort. In addition:

- **Addison** has awarded a franchise to RedMoon to build and operate a wireless high-speed data network using Wi-Fi. No reports of discussions yet on how to get coverage of 1 Mbps inside buildings.
- **Corpus Christi** is deploying a wireless data network to let 188 police and fire vehicles use high-bandwidth applications such as AVL and streaming video. This network uses service from a commercial wireless carrier for wide-area coverage and Tropos-supplied private mesh network to cover a 20-mile section of the downtown area. There will be a seamless roaming functionality and stringent network security. Tropos, a Wi-Fi provider, estimates that with \$68,000 of its equipment, one typical city square mile could offer 10 to 15 Mbps per user concurrently.
- **St. Charles County, Missouri**, wants to be the country's first totally wireless Internet county. An initial study has been funded by Partners for Progress, an organization of 28 major employers in the county. (Broadband Wireless Exchange Magazine, 4/28/05.)

³ The study was undertaken by George S. Ford of Applied Economic Studies (Florida) and Thomas M. Koutsky of First Legal Advisors (Maryland), and reported in April 2005.

⁴ "Connecting the Public: The Truth About Municipal Broadband," Consumer Federation of America, Media Access Project, and Free Press, April 2005. These and other reports supporting municipal broadband efforts can be found at www.freepress.net/communityInternet/reports.

- **Minneapolis** has a privately-owned Wi-Fi system in the works. The city has requested proposals to build a \$15 - \$20 million system. Initial service will likely be provided within 12 months after signing the agreement, and city-wide service should be available 6 to 12 months after that. The system will improve city communications, linking every city building, police car and housing inspector to the city's databases. Consumers would be able to buy broadband access of 1 to 3 Mbps for \$18 to \$24/month. The city says it will attract new businesses and economic development. No tax money is involved; it will be paid for, built, owned and operated by the winning bidder. Wi-Fi antennas will go on city buildings, light poles, traffic signals. The high capacity fiber-optic network will combine all wireless signals for connections to the Internet. Fiber-optic connections will also be provided to business customers who need more capacity than wireless connections can provide. Existing hotspots will be linked to the city-wide network.
- **Philadelphia** has a plan to offer wireless access to residents for \$20/month. The network will be leased to other, private providers that will sell support and services. The network will cost \$15 million to establish and will be financed through taxable bonds and low-interest loans. It should be up by August 2005 and will cover a 135 square mile area. The city will build and maintain the network, and will lease the network back to other providers. ISPs will handle all billing, marketing, customer service, and at-home equipment needed to pick up the signals. The city will be a customer of the network by allowing city departments to buy broadband access to communicate with one another. The city expects to save \$2 million in telecommunications costs alone by year 3 (will replace T-1 leased lines and cellular subscriptions). The city will also establish a non-profit organization that will provide computers and technical training to low-income residents. The city will provide the non-profit with access to rights-of-way and to city-owned property and electric poles. Neither the city nor the non-profit will be an ISP. By wholesaling access at low prices, they hope to increase the number of ISPs delivering service to residents and businesses. This prevents the ISPs from having to set up their own infrastructure (roof and pole rights, equipment on light poles, etc.). Projected wholesale prices range from \$9 for residential to \$100 for premium businesses. Other potential customers are cable companies, hotspot roaming providers, and hotel chains.
- **Tempe** is considering a city-wide wireless network to compete with wired broadband offerings of Cox and Qwest. The monthly subscription cost is projected at \$30, and will provide unlimited Wi-Fi access for laptop and PDA users.
- **Rio Rancho, N.M.** has the first carrier-class voice-over-Wi-Fi telephone service in the U.S. in a metropolitan area. This network offers carrier-class fixed and mobile services and will be available on the Rio Rancho network, which now covers about 60% of the city, and provides an IP-based alternative to traditional "local loop" service provided by telecommunications companies. The Wi-Fi "cloud" will support mobile calls up to 55 m.p.h. Roaming in and out of cellular CDMA (code division multiple access) and GSM (global system for mobile communications) networks will be added later this year. This is a converged voice, data and video system, using 200 Wi-Fi access points connected to a pre-WiMAX backbone that provides the backhaul to the networks' operation center and the Internet. Current phone numbers will be portable onto the system. Caller ID, call forwarding, voice mail over e-mail, multiparty calling, call waiting and Web-based call control manager features are available. Consumers will pay \$29.95/line for unlimited calling in the U.S. and Canada. Business service, which will add fax, four-digit intercompany calling and other features, will be available.

- In some areas of **Michigan**, you can pay an additional \$4.95 to the gas station attendant and get access to Wi-Fi service. Also available at laundromats, fast food restaurants, and oil change businesses. Check your email while you fill up and clean up!

Critics of municipal Wi-Fi (who may or may not be shills for the industry), cite the following as important concerns, each of which can be, and have been, effectively rebutted:⁵

- Wi-Fi networks will likely cost more than the cities anticipate, thus straining already tight budgets and negatively impact taxpayers.
- Public funds used for a Wi-Fi network are diverted away from other important areas, such as education, police and fire services, and public works, that are already being cut in many cities today.
- Wi-Fi technology could quickly become outdated, leaving the city and its residents with a less-than-optimal network that offers no opportunity to recover the city's investment.
- There is no market failure in broadband, and entry by municipal Wi-Fi providers will not create greater competition – in fact, the Wi-Fi market is already very competitive, with service offerings from large and small providers alike.
- City-managed networks operate under different rules than private providers, offering the city regulatory and economic advantages.
- Municipal entry into the broadband market will likely reduce investment by current providers and threaten the business of small, local ISPs.
- There is no evidence that economic development will directly result from publicly-funded city-wide Wi-Fi deployment.
- Previous municipal attempts to deploy broadband networks (mostly wireline) have failed, and even though Wi-Fi costs are potentially lower, the municipal ownership model is still flawed.⁶

What are Cable Companies and Telcos doing with Wi-Fi?

Comcast has formed an alliance with T-Mobile (largest hotspot provider in U.S.). This gives Comcast's high-speed data customers access to T-Mobile's more than 5,000 hotspots in Starbucks coffee shops, Borders, FedEx, Kinko's, airports, and other locations.

Time Warner is rolling out Wi-Fi service to hotels, hospitals, restaurants, car dealerships, shopping malls, apartment houses, country clubs, medical clinics, airports. It is mostly pitching its RoadRunner Speed Zones to businesses, not consumers. The company will install one or more wireless access points at a location and sell the client a bucket of broadband access for a flat fee. The client can then either sell time to its customers or offer free access.

⁵ See, for example, Jim Baller's article "*Deceptive Myths About Municipal Broadband*," May 2005, at www.broadbandproperties.com.

⁶ All this from '*Not in the Public Interest – The Myth of Municipal Wi-Fi Networks*' Why Municipal Schemes to Provide Wi-Fi Broadband Service With Public Funds Are Ill-Advised, New Millenium Research Council, February 2005.

Charter offers broadband and dialup service nationally in tandem with RemotePipe, a Wi-Fi wholesaler. Charter will first offer service to residential and commercial data subscribers free on a trial basis, then will charge hourly or daily rates. Charter is also offering a wireless networking service, Charter Home Networking, which offers an integrated wireless gateway (router and cable modem in one device), wireless PC cards, installation, service and 24-hour technical support.

SBC offers its DSL customers a subscription to FreedomLink Wi-Fi- service for \$19.99/mon, with a one-year contract. SBC will also offer a discounted subscription for its DSL customers that will cover roaming hotspots.

What is Fiber to the Home (“FTTH”)?

Optical fiber has been installed by most cable providers since 1990 for the long-haul of their cable television service, and lines connecting directly into the home have historically consisted of coaxial cable. Running fiber to the home (“FTTH”), to the neighborhood (“FTTN”), or to the premises (“FTTP”) is becoming a more common method of delivering broadband services to consumers. It is possible to carry many different channels through the same fiber, and analog video can be provided along with digital data in the same fiber. A single fiber strand has enormous capacity, but in the past has had high construction costs. With the development of the fiber technology, costs are coming down, and fiber to the home is becoming more prevalent.

Cities around the country are being active in the provision of FTTH. A paper by Broadband Properties (September 2004) claims that data shows an increase in the probability of municipal action, and in the likelihood that such action will result in the choice of FTTH over competing broadband technology alternatives. Communities with municipally-owned electric utilities are most likely to deploy FTTH. Citing data from the American Public Power Association, the study concludes that municipally-owned utilities offering internal communications services are significantly more likely to offer external communications services to the public and more likely to consider FTTH. Once the facilities are installed the decision to deploy infrastructure to the public becomes incremental.⁷

The Broadband Properties paper provides the following statistics on the provision of FTTH by various entities:

	2002	2003
Municipally-owned utilities	27%	32%
CLECS	67%	42%
Small ILECs	5.4%	6%
Other	0.6%	3%
Developers	n/a	17%
Total homes passed:	80,000	190,000

The U.S. Optical Fiber Communities list was released on May 10, 2005, showing that FTTH installations have grown 83% since October 2004, now reaching 398 communities in 43 states. Verizon claims it is on track to pass 3 million homes with fiber by the end of 2005, offering customers Internet service at up to 30 Mbps. NTS Communications, an independent provider of triple-play voice,

⁷ Unfortunately, it must be pointed out that Texas cities are prohibited from providing telecommunications services, whether through fiber, coax, or plain old copper. Utilities Code §§ 54.201, 54.202. See discussion, *infra*, for likelihood of Texas cities being able to provide broadband services.

video and data services, plans to deploy fiber optic facilities to more than 90,000 premises in the Lubbock and Wolfforth, Texas areas. NTS claims it has experienced a 35% “take rate” for FTTH services after only months in the market. The “U.S. FTTH Communities 2005” list is available at www.CommunitiesInFocus.org.

What is Voice over Internet Protocol (“VoIP”)?

VoIP is the use of the technology and common language of the Internet to deliver voice communications. How does it work? Voice is digitized at the handset and sent out as packets of data that automatically route themselves over the Internet making time and distance irrelevant. Now, they are typically made on a computer using a special headset, or on a phone with a special adaptor. VoIP is increasingly available over mobile phones, using Wi-Fi technology. Eventually, it will be available on all devices, from TVs to iPods, and even to appliances like refrigerators! VoIP will make digital convergence a reality, blurring lines between telecoms, cable, computers and consumer electronics.

Several examples of VoIP today:

- pulver.com’s Free World Dialup. This uses software and hardware at the customers’ premises to place calls between two computers connected to the Internet.
- Vonage’s Digital Voice and 8X8’s Packet8 services, which permit any user with a broadband Internet connection to initiate voice communications over IP technology.
- SBC’s Hosted Internet Protocol Communications Service (“HIPCS”) project, a web-browser-based information and communications management tool that users can access from anywhere through the Internet. This service allows users to access all of their communications services from anywhere they can access the Internet, customize the manner in which calls from different categories of callers are routed to them, and access from a single web page text and voice messages received from their primary phone, cell phone, and email accounts.

There are several ways to offer VoIP:

- Jump off the Internet immediately into the Public Switched Telephone Network (“PSTN”) and incur charges from telecos and IXC’s to carry traffic and terminate calls;
- Use the public Internet to get close to the destination, then drop off to the PSTN. This may be cheapest but creates maximum exposure to vagaries of Internet – delayed and lost packets; or
- Create your own Internet to get close to the destination, then drop off to the PSTN. This is more expensive, but puts the operator in control of quality and reliability.

All is not entirely rosy, however. There are some downsides to VoIP service:

1. Generally you will lose your telephone number. Callers to your old number will not be redirected to the new number, they will be told you have been disconnected.
2. 911 is problematic. Some companies are charging an extra \$5 per month for “E911” which does not dynamically recognize your location. Dialing 911 on a VoIP service connects you to the nearest PSAP (public safety answering point) for the billing address. So, emergency services will arrive at your home, which may not necessarily be where you are (you could

be using your VoIP account from someone else's broadband connection). Congress and/or FCC will probably deal with the issue of additional charges. (See more below.)

3. If the Internet goes down, so does your phone. If the power goes out, so does your phone.
4. VoIP services are usually tied to semi-monopolistic cable companies.
5. Since VoIP is Internet-based, and some of its services are accessed directly through websites, systems can get hacked into.

However, you will be able to order any area code you like. VoIP uses a router that allows both PCs and phones to be connected to the broadband Internet through the DSL or cable modem. The information from an analog phone is converted from analog to digital for the outgoing part of the call and then from digital to analog for the reverse. The call leaves the subscriber's home on the Internet; at the destination the call is transferred from the Internet to the PSTN where it is transported to the called party's phone.

Comcast Digital Voice offerings have launched in Boston and Hartford. This is a residential phone service that travels over the company's privately-managed advanced broadband network using IP technology, not the public Internet. This is different from VoIP providers and should help with quality and reliability concerns. It uses the same network used by Comcast High-Speed Internet, Digital Cable, VOD, HDTV and digital video recorders. Customers can use existing phones and phone numbers to make and receive calls, and will soon be able to use Comcast's new Digital Voice Web portal to check voice mail and manage accounts from the Internet. The price is \$39.95/month (includes E911, battery backup and 24/7 network monitoring, customer care, and technical support). Comcast plans to reach 20 markets and 15 million homes in 2005, and all Comcast markets (40 million homes) by year-end 2006. **Time Warner** and **Grande Communications** are offering similar services in Texas.

AOL is offering Internet phone service in 40 cities at \$13.99/month for a local calling plan, and \$29.99 for unlimited North American calling. Prices increase by \$5 after 3 months. New subscribers can get Internet services and phone service for \$29.99/month for first 6 months and \$39.99/month thereafter.

More about 911 Issues:

Texas Attorney General Abbott filed a lawsuit against Vonage in March 2005 for failing to make clear to its customers that the company's current service does not include access to traditional emergency 911 service. The lawsuit arose out of an incident in Houston. A family's house was being broken into; when the daughter tried to call 911, a recorded voice told her that no emergency access was available from that line. ("Stop. You must dial 911 from another telephone. 911 is not available from this telephone line. No emergency personnel will be dispatched.") The suit was filed under the Deceptive Trade Practices Act, and requests an injunction to stop Vonage from misrepresenting the type of emergency service it offers. Customers must proactively sign up for 911 service, but the limitations of that service are also not revealed.

The Connecticut Attorney General has also sued Vonage over 911 service (on grounds similar to the Texas suit), and the NYC Police Department is irate over misdirected 911 calls to administrative desks at 911 call centers.

VoIP's mobility is also its downfall with relation to 911 service. Vonage offers a subscriber the ability to pick an area code; a user in California could choose a New York area code. Technology is used to map a subscriber's physical address to the nearest PSAP to enable basic 911 calling. The burden is on the consumer, when hooking up service, to manually activate the 911 service. Vonage could modify its subscription process to collect the user's physical address and handle the 911 activation before shipping the equipment.

911 problems are linked to the technology behind Internet calling. Any VoIP carrier wanting to directly connect to the 911 system must be a certified carrier, and getting certified can be a very expensive process. In February 2005, Vonage asked the Baby Bells to begin to provide the VoIP provider access to the 911 infrastructure. Vonage and Verizon and Qwest have apparently reached agreements that give Vonage access via 911 trunks that will route 911 calls to Verizon's and Qwest's routers by November.

FCC Chairman Kevin Martin announced on May 4, 2005, that the FCC will soon be issuing an order that would require all VoIP providers that connect to the Bell telephone network to route 911 calls directly to the appropriate PSAP. As of this writing, this order is expected to be adopted on May 19 and will go into effect early in the 4th quarter of 2005. This will likely encourage the industry to develop an interim solution that will enable nomadic VoIP providers, such as Vonage, as well as affiliate carriers and smaller players, to correctly route 911 calls to the appropriate PSAP regardless of the caller's location. This is likely to increase the costs of VoIP providers, and may hurt the smaller companies. Currently, all ILECs and CLECs have the right to lease 911 trunks from the Bells and other ILECs in order to route 911 calls to the local PSAP. This may also lead to governmental fees on VoIP providers for E-911 services. If FCC rules require VoIP providers to access the PSAPs, then the VoIP providers may have to share in the cost of providing the service, such as the per-line assessments currently paid by the telcos.

It is expected that this 911 order will require VoIP providers to implement 911 service on a nationwide basis within 120 days of the order's publication. It is also expected that the FCC will require Internet phone providers to register customers with 911 providers before turning on their service, and to allow customers to update their location if they travel or move. It is not expected that the FCC will require 911 connections for services such as instant messengers, Skype, Free World Dialup, or other computer programs that allow users to talk to each other but not make phone calls outside their particular system.

On May 11, 2005, SBC Communications issued a press release announcing its plans to help Internet phone companies offer more reliable 911 services for their subscribers. Although the press release promised "safety and security" for 911 services, the big issue – the price for such access – has yet to be worked out.

It is interesting to note that according to the *Wall Street Journal*, more than half of the U.S. still lacks the technology to find cell phone callers dialing 911. The *Journal* reported on May 12, 2005, that more than one-third of the 190 million calls placed to 911 each year now come from cell phones. Virtually all of the nation's 6,000 call centers can locate land-line phones, but only 41% of them can locate cell phones. Public safety officials have apparently estimated that it would take \$8 billion and at least four more years to modernize the nation's 911 system for wireless calls.

In an interesting twist, the state-owned telecommunications monopoly in Costa Rica ("ICE") has proposed legislation that could criminalize the use of Internet telephone calls. It views VoIP as a

value-added telecom service that should be regulated. 20% of that country's international calls are made using VoIP technology.

What is Broadband over Power Lines?

Broadband over Power Lines ("BPL") uses electric power distribution wires for the high-speed transmission of data by transmitting high-frequency data signals through the same power distribution network used for carrying electric power to household users. The Internet data is transported over the utility's existing middle-voltage network. The signal is inserted in the grid at a point that becomes the hub for that portion of the network (the "cell"). Each cell on the network can support up to 256 individual devices. The hub can be connected to the Internet by any means, whether dedicated circuit (T1), fiber link, or wireless data link. Thus, although it uses wires, it behaves more like a wireless technology. Just as Wi-Fi broadcasts to everyone within radio range, BPL broadcasts to everyone on an electric circuit.

In a common form of BPL, the broadband connection is provided over the electrical wires that enter a house; a customer can obtain Internet access by plugging a BPL modem into any electric outlet. In another form, Internet access is provided using a wireless device (such as a Wi-Fi access point) connected to a BPL distribution system outside of the home that communicates with the customer's computer or other equipment inside the home. No new wires are needed, and BPL can be accessed anywhere in each house without additional inside wiring. However, there are problems with carrying the broadband signal over long distances. Speed of data is expected to be 100 Mbps or more on the medium-voltage power lines.

In addition to customer broadband uses, BPL systems can be used by electric utilities to manage their electric power networks more efficiently for automatic meter reading, voltage control, supervisory control and data acquisition ("SCADA"), equipment monitoring, energy management, remote connect and disconnect, power outage notification, and the ability to collect detailed power usage information (such as time-of-day power demand).

BPL is a "carrier-current" system that operates on an unlicensed basis under Part 15 of the FCC's rules (47 C.F.R. § 15.1, et seq.), which allows certain low-power unlicensed equipment to operate on a non-interference basis. Carrier-current is a term used to describe systems that intentionally conduct signals over electrical wiring or power lines.

"Access BPL" is when electric power lines are used to provide Internet connectivity into a home from an outside source. Access BPL employs outdoor devices that inject data signals into the medium- and low-voltage power distribution network to provide internal access to a neighborhood. Since BPL signals cannot usually pass through an electric distribution transformer, additional equipment usually is required to allow the data signal to bypass distribution transformers, or to regenerate the data, in order to get the data signal into customers' homes. Sending the broadband data over high-voltage overhead wires can turn the electric grid into a giant radio transmitter on the valuable short-wave band, and can interfere with ham radio operations and emergency communications. The shortwave transmissions are reflected off the upper atmosphere and can travel all around the world without the help of repeaters.

The other type of BPL is "in-house BPL," which utilizes indoor adapters to transmit data signals over existing interior electric wires within a home, and to connect the data signals to various appliances. In-house BPL systems use the electrical outlets available within a building to transfer

information between computers and other home electronic devices and appliances, eliminating the need to install additional wires among devices. This was initially seen as a home networking technology, but its success was limited by competition from cheap Wi-Fi routers. Perhaps the market is there in large hotels and apartments that are not wired for the Ethernet.

A typical BPL signal will only propagate along a power line for 1,000 to 3,000 feet before it becomes too weak or distorted to be useful. Repeaters can be used to regenerate and amplify the signal. Some providers don't use repeaters, as they decrease overall bandwidth, require the use of additional frequency spectrum, and introduce some delay in the data signal.

One of main problems with BPL is actual and potential radio interference. Because BPL systems use frequencies (1-80 MHz) that radiate into the air from the open wire power conductors, they cause possible interference to licensed services, including emergency services and amateur radio operators. The open-air power lines are excellent radiators of other frequencies used in BPL systems, so they behave as transmitting (and receiving) antennas. In October 2004, the FCC issued rules to limit interference to other frequency devices, attempting to mitigate ham operators' opposition to BPL systems. Whether the interference problems have actually been solved, however, is not certain.

Current pilot projects are underway in Castroville, Weimar, Burnett and Blanco, Texas. In Weimar, BPL is now available to the downtown business district, and there are plans to serve the entire 2,200 resident town by early June. BPL holds promise especially for rural areas that now rely exclusively on satellite broadband as their only option, but significant problems still remain owing to the need for repeaters at frequent intervals.

What are the regulatory issues related to BPL?

Electric regulations. Although outside the scope of this presentation, generally the electric regulatory issues relate to cost allocation (who bears the costs of the BPL and distribution system – core electric ratepayers or BPL customers?), and affiliate transactions (potential cross-subsidization issues). See the discussion below related to SB 1748.

Communications regulations. These include easement and right-of-way issues (do electric franchise fees adequately compensate the municipalities for this additional use of the right-of-way?), pole attachments (should pole owners be allowed to increase their pole attachment rates for lines carrying broadband in addition to electric current?), provider access (should every broadband provider be entitled to access to the wires?), licensing (should providers of BPL obtain licenses, CCNs from state?) and universal service requirements (should BPL providers be required to pay into the federal Universal Service Fund and state funds?). Because each distribution system can only support one BPL provider, there will be continuing issues raised by the telecommunications and cable companies with regard to "equal access."

The FCC has proposed filtering BPL signals so that they do not use the most important shortwave frequencies, but there is no agreement on which frequencies should be filtered. The FCC's rules adopted in October 2004 regarding interference with ham radio operators require the BPL equipment to have the capability to mitigate interference by notching or shifting frequencies or remotely shutting down altogether in response to complaints of interference. The United Power Line Council ("UPLC"), an association of electric utility companies, will manage the public database of BPL projects as a way for those experiencing interference to track down the source and get it fixed. The rules also establish exclusion zones around Coast Guard and other governmental installations

where BPL is forbidden. Also, interference with radios used for public safety must be fixed within 24 hours or face being shut down.

What is Broadband in Gas?

Believe it or not, this does not refer to the consumption of beans. Nethercomm Corporation has announced the development of Broadband-in-Gas (“BiG”) technology, which is designed to multiply the current available bandwidth of cable television and other broadband systems with data capacities exceeding ten gigabits. (I’m not making this up.)

This technology uses the “private spectrum isolated within natural gas pipelines” and apparently does not require any modification to existing natural gas distribution infrastructure. Yet another way to deliver the last mile of networks, it can reportedly do so without interference or degradation of other wireless transmissions. Nethercomm is developing natural gas, broadband and consumer electronics partnerships to validate and certify its technology for use in existing natural gas pipelines. It will introduce signals into the gas lines using inexpensive equipment located at existing neighborhood network hubs and extract data at the customer or business premises (probably at the gas meter) with end-user-installed equipment that can operate seamlessly with most existing and deployed digital set-top boxes.

Critics question the ability of the UWB technology to provide the claimed high-speed data exchange rates, citing the need to have a substantial number of UWB modules embedded in the pipeline in order to overcome the distances necessarily involved. This could raise the price of the service and require substantial investment by the gas companies. Installation of the hardware would require shutting off gas service, which could be very expensive. Also, the advisability of sending UWB signals through plastic pipe is dubious.

In recent years during electric franchise renewals, most cities have at least contemplated the possibility of the electric utility offering additional, non-traditional services over its lines. From the sound of this announcement by Nethercomm, it is probably time to start having similar thoughts when renewing gas franchises.

What is Triple Play?

Triple play, the latest catch-phrase of the industry, refers to the provision of voice, high speed Internet and entertainment services by one provider. This is now a race between the telephone and cable companies as to which will provide the entire package.

Telecommunications providers need to add Internet and entertainment services to their packages. How will they do this? SBC and Verizon are approaching this from different directions. Verizon is offering FTTP under the name FiOS, and is aggressively rolling out the service. Essentially, the fiber is overlaid over copper wire, and a unit on the house converts light to an electric signal. There are different channels for different services – phone, cable, video, data. The equipment is placed throughout the neighborhood in conduits, and is ready for connection when the customer signs up. The demarcation point is on the customer’s premises. All of the fiber is underground in conduit and boxes. The system is powered by the customer’s power source, therefore it needs a battery backup or there will be no communications services at all when the power is out. This is an all-fiber network, with totally new service to each home. As a result, more construction is needed, and Verizon has been obtaining video franchises in communities (more on this later). Verizon will spend approximately \$1,000/home passed to construct its system, and intends to pass five million homes in

the next three years. This triple play is also being offered by other providers, including Grande Communications, which currently offers FTTH in Austin.

SBC is bringing fiber to the node under its Project Lightspeed offering. This is a combined fiber and wire network, with the fiber running only as far as a neighborhood node. From the node to the homes, SBC will use existing twisted pair phone wires. All video channels will be delivered to the nodes, and each subscriber will have the capacity of four concurrent streams of video to their home, with the actual switching taking place at the node. Thus, when the user switches TV channels, the signal goes back to the neighborhood node where the intelligence resides to switch between channels. There will be a delay in the switch, but probably so small as to be not noticeable. The system receives its power from the telephone system and requires an above-ground serving area interface, usually a cabinet on the right-of-way. This service is all IP-enabled. SBC now passes 18 million homes, and expects to spend \$250/home passed, and \$600 (dropping later to \$300) per home installed.

SBC has divided the market among high-value customers (25%), middle-value customers (40%), and low-value customers (35%). The cut-off between middle- and low- value is that middle-value customers will have an average monthly bill of at least \$110 for all of SBC's services. SBC says it will build out so as to reach 90% of the high-value segment, 70% of the middle-value segment, and 5% of the low-value segment.

If this were a franchised service, it would most likely violate 47 U.S.C. § 541(a)(3) and (a)(4), which require that a franchising authority must assure that access to cable service is not denied to any group of potential residential cable subscribers because of the income of the residents of the local area in which they reside, and direct the franchising authority to allow the applicant's cable system a reasonable period of time to become capable of providing cable service to all households in the franchise area.

Economic red-lining is quite an issue at federal and state levels. Rep. Markey (Mass) has focused on Verizon's Massachusetts fiber rollout, targeted primarily at upscale, mostly white, suburban communities. SBC is in trouble in Chicago for allegedly favoring upscale neighborhoods for deployment of its high-speed Internet fiber project, Lightspeed. Part of the debate centers on the "hands off" regulatory measures, which the telephone companies believe enable them to install fiber-optic networks without first obtaining local and state regulatory approval. In 2002, AT&T Broadband was charged in a class-action lawsuit in Florida for red-lining high-speed broadband Internet service.

The National Association of Broadcasters is also concerned about plans of Verizon and SBC to wire homes with high-speed fiber connections. The Association argues that Congress should prohibit SBC and Verizon from offering digital TV unless they follow an extensive list of government regulations: local broadcasters must remain the only source for network programming, fiber providers must be required to "black out" the availability of certain sports games, and local TV broadcasts must be carried on fiber networks. How about compliance with privacy rules and set-top box interoperability requirements? How about compliance with indecency rules? How about compliance with anti red-lining prohibitions?

SBC has thrown down the gauntlet in the war of words between it and franchising authorities. SBC has said that since it uses a pure IP platform to deliver its service, it has no intention of seeking local franchises, and has taken its case to the Congress. As SBC's assistant VP for regulatory policy, Brent Olson, has said, "We are going to have more people welcome this service than take us to court on franchise grounds."

Verizon is also on the warpath against franchise requirements. Even though Verizon has obtained franchises from some smaller cities in Texas (and at least one in Florida), it is clearly hedging its bets and expending lots of effort to moot any additional franchise requirements. In fact, Verizon Communications, Inc. chairman and CEO Ivan Seidenberg recently offered a deal to broadcasters “We’ll carry your programming if you help us eliminate franchising requirements to provide video in competition with cable.” Mr. Seidenberg has called the franchising process the biggest barrier to Verizon’s entry into video, and has suggested a federal level solution. (Addressing National Association of Broadcasters, Las Vegas, NV, 4/18/05.)

Cable providers, on the other hand, simply need to add voice to their data and entertainment lineup. Since the 1980’s, high-quality fiber optics have been deployed by cable companies to hubs serving about 2,000 homes, where signals are divided and sent on to nodes serving 200-600 homes. Fewer amplifiers are now needed to reach most customers. Digitization has also increased the capacity to several hundred channels by allowing as many as 10 digitized channels to be supported in the same frequency “slice” (6 MHz) previously required for a single analog channel. The cable networks are able to support broadband telecommunications services as well as video.

Internet access is a big money-maker for cable companies, who now claim close to 20 million subscribers at \$40-\$45 per month for broadband access. Cable operators pass virtually all TV-equipped homes and have about a 60% penetration. They have continued to deploy fiber and have upgraded their systems to easily add voice services, including to large businesses and business parks.

Telecommunications providers, however, have lost about 25% of their access lines between 2000-2004, which is attributable to fewer second lines as broadband penetration has made them superfluous, to cable telephony, and to the proliferation of wireless service. The bulk of cable providers’ network deployment is done. They still have to split nodes to provide the additional capacity required for broadband business (about \$125/subscriber), and have to add telephony at a cost of \$250-550/subscriber. Most cable companies will be providing telephony using VoIP, but some (Cox) started off using conventional circuit switching which goes through conventional channels and switching.

Cable companies (and telcos) are bundling their services, offering discounted video or data services if telephony services are also purchased. This could have a substantial impact on the amount of franchise fees paid to cities; if \$50 cable service, \$40 telephone service, and \$40 data services are combined and sold for \$100, where is the revenue allocated? Is this up to the company? the City? GAAP? In fact, Comcast cites bundling as representing savings and convenience to consumers, reducing churn, improving loyalty, and providing higher lifetime value to service providers.

What’s the Quadruple Play?

Just throw wireless into the mix and add the feature of “mobility,” which wireless of course dominates. Data and entertainment by wireless providers is still limited, but available.

What is Going on at the Texas Legislature?

Funny you should ask. What a long, strange session it’s been. A more tortured path for tortured legislation would be hard to imagine. The lesson to be learned here is to never try to write a paper three weeks ahead of time while the legislature is in session and expect the paper to be timely and up to date when it’s presented. The landscape changes daily; bringing the writing of this paper to a close required me to essentially give up with trying to keep it current – it was never getting done!

HB 789 – the major telecommunications utility re-write of the Public Utility Regulatory Act.

As passed by the House, this bill essentially deregulates (even more) the provision of telecommunications services and encourages “intermodal competition.”

This bill creates new definitions:

- “network provider” is an entity, whether or not certificated, that is not a service provider, and that uses any technology to offer voice communication to the public over a wireline network that the provider or an affiliate of the provider owns or controls.
- “service provider” is a local exchange company or a provider of interexchange telecommunications service.

The bill maintains the prohibition against municipalities being certified as network or service providers. A municipally-owned utility *can*:

- provide a governmental function or service to its customers that is enabled, enhanced, delivered to, or available to the public using the Internet, including bill paying services, emergency services, constituent services, utility meter reading, and permitting;
- provide access to its transmission and distribution facilities under a contract with another entity that allows the entity to provide the entity’s customers with high speed data services using BPL technology, so long as the compensation to the city covers its costs incurred in the provision of such access;
- provide any energy related services.

Under this bill, municipalities *cannot*:

- Offer for sale to the public a service for which a certificate is required or a non-switched telecommunications service used to connect a customer’s premises with another premise or a long distance provider;
- Charge for wireless broadband services, including Wi-Fi, unless charges were assessed on January 1, 2005, in which case the charges can continue.

This bill also addresses utility relocation:

- Relocation at provider’s expense to permit widening or straightening of a street;
- City must give 30 days notice and must specify the new location in the right-of-way.

And pole attachment fees:

- City or municipally-owned utility cannot charge fees that exceed what they would be able to charge if they were regulated by the FCC;

- Not later than September 1, 2006, the city or municipally-owned utility shall charge a single, uniform pole attachment rate to all entities not affiliated with the city or muni regardless of the services carried over the network attached to the poles or in the conduit (*i.e.*, lowest rate allowed by FCC).

And 911 services:

- A certificated provider must provide access to 911 service provided by a local authority or dual party relay service.

Cities found themselves with allies at the Committee level: Michael Dell himself made personal calls to Speaker Craddick and other lawmakers, speaking against legislation that would prevent cities from offering Wi-Fi services. One can surmise that this type of pressure caused the “No Municipal Wi-Fi At All” provision to be eventually deleted.

The Senate Business and Commerce Committee considered a substitute bill, introduced on May 16, 2005, and provided by the Chairman of that committee, Sen. Troy Fraser. As initially considered by the committee, the substitute bill did not contain any of the HB 3179 provisions (statewide cable franchise) (see discussion below). The substitute bill also did not initially deal with Wi-Fi provided by local governments. These provisions could be added to the bill when it reaches the Senate floor. As of May 19, 2005, this bill was left pending in the committee.

HB 3179 – the statewide cable franchise bill.

Initially, this was a negotiated bill – parties at the table were the telcos, the cable companies, the wireless companies, and cities. What began as an attempt to deal comprehensively with “communications,” be it wireline, wireless, video, voice, or data, ended up something else entirely. As introduced, HB 3179 envisioned an “intermodal communications assessment” as an amendment to the Tax Code that would be applicable to all communications services, defined as “the transmission, conveyance, or routing of a video service or voice service by or through any electronic, radio, satellite, cable, optical, microwave, or other medium or method, irrespective of when devised, regardless of the protocol used for such transmission or conveyance.” Voice and video services included IP enabled voice and video.

The intermodal communications assessment would have been imposed on each sale of a communications service that is a taxable item at the rate of 3.95%. The fee was to have been paid to the Comptroller on a quarterly basis, who would then parcel the funds out to municipalities and the Office of Rural Community Affairs on the same basis as provided in Chapter 321 or Chapter 151 (sales tax disbursements). A savings clause was provided, with the result that if any part of the assessment is held to be invalid, or if any communications service provider is determined by law to be exempt from the payment of the assessment, the *rate* of the assessment would have been adjusted to the extent necessary to maintain *the same level of collections* that would have been collected but for the exemption. What’s confusing is the additional language that provides that the remaining providers shall be afforded an adjustment that ensures “competitive neutrality in the application of the assessment.” Those words are what got the ball rolling in the first place on this bill; it’s not clear how that would have been applied. If one voice provider is exempted (because of the use of IP to provide the service), but non-IP providers are not exempted, one could expect the non-IP provider to claim that its obligation to continue to pay the assessment was not competitively neutral, in which case we would have been back to square one. Such a discussion is clearly academic, however, because of what

happened after this bill was introduced, and *after* public hearings were held on it. But more on this later.

Other provisions of HB 3179, as introduced, are as follows:

- Provides for a *de facto* state-authorized franchise to provide video services upon compliance with the following:
 - ✓ Within 90 days after the provider offers digital video service at 750 MHz capacity, and upon request by a municipality, provide the municipality with PEG access channel capacity (up to 3 channels for population of at least 50,000, up to 2 channels for population of less than 50,000), with the number of channels not to be less than the number received by the city under a franchise immediately preceding the effective date;
 - ✓ If the video service provider is also a CTP, then video service must be offered to the same areas where the CTP uses its network to provide voice service, with no discrimination against low-income, minority, or rural residents in the sequence of providing such service; and
 - ✓ Service provider must abide by any customer service requirement established by the city (not to exceed the FCC requirements).
- Allows video service providers to terminate franchises by providing notice to cities of same, effective on the date of receipt of the notice.
- Provides for city enforcement of these requirements, but a city is not allowed to discriminate against, or provide preference to, any provider. A city may also require that a video service provider register with the city and maintain a current point of contact, that the provider file reports as to compliance with customer service standards, provide reasonable sanctions for non-compliance with the above requirements, and establish guidelines for the use of PEG access channels.
- Preserves the cities' police powers in the management of public rights-of-way. Police power regulations must be competitively neutral and may not be unreasonable or discriminatory, and may not infringe upon business decisions of communications service provider.
- Prohibits city charging pole attachment fees or conduit use fees that exceed the fees it could have charged if it were regulated by the FCC.
- Prohibits city from charging any other fee for use of right-of-way.
- Provides for payment of relocation costs, as follows:
 - ✓ All relocations to accommodate public improvement projects to be performed at provider's expense;
 - ✓ Public improvement projects defined as construction or improvement activity in a public right-of-way undertaken by or on behalf of a city or in conjunction with another entity for any public purpose, other than a construction or improvement activity undertaken solely for beautification purposes;

- ✓ City to give advance notice, and to design public improvement projects to minimize the relocation of any communications facility; and
- ✓ Provider to have no less than 90 days to relocate facilities and city must designate new location along right-of-way.
- Repeals Chapter 283, Local Government Code (access line fees).
- Repeals Chapter 62, Utilities Code (Broadcaster Safeguards).

Having early on seen the handwriting on the wall, TML and TCCFUI and individual cities joined the discussion about HB 3179, and worked to make this bill more palatable to cities. The telcos were on board, wireless was on board, but cable balked. The cable industry charged that the bill would allow SBC and Verizon to engage in red-lining, and unless the phone companies were held to the same ubiquitous service requirements that the cable companies had been held to by franchises granted by cities in the past, the cable industry was not going to support the bill.

After public hearings were held on HB 3179, the House Regulated Industries Committee passed a committee substitute that looked very little like the original bill or even the earlier committee substitute that was the subject of the public hearings. Not only did the bill change substantially without public input, the substance of the bill (and of several others) was added to the PUC sunset bill (SB 408, passed by the Senate without the telecommunications language), and to HB 1779 (another PUC sunset bill). HB 3179, HB 1779, and SB 408 were both on the House calendar on May 12, 2005.

As passed by the Committee, the bill ignores intermodal competition, does away with the intermodal communications assessment, and establishes a *de jure* statewide cable television franchise, to be granted by the secretary of state. The “certificate of franchise authority” grants the authority to provide cable or video service as requested, authority to use and occupy public rights-of-way subject to police powers of municipalities, and is fully transferable. This bill also allows a cable service provider to terminate any municipal franchise beginning on September 1, 2005, by providing written notice to the city. The city retains the right to audit franchise fee payments for one year after termination; the audit period cannot exceed four years prior to termination. On termination, the provider has to pay the city a 5% gross revenues fee.

For the first time, “gross revenues” are defined to include:

- all fees charged to subscribers for any and all cable or video service, commissions received by the provider (*i.e.*, home shopping commissions); and
- a pro rata portion of revenues derived from advertising (based on number of subscribers in the city divided by the total number of subscribers in the regional or national compensation arrangement).

“Gross revenues” specifically does not include:

- revenues not actually received (“bad debt”);
- revenues received by an affiliate or other person in exchange for supplying goods or services used by the provider;

- refunds, rebates, or discounts to subscribers, leased access providers, advertisers, or the city;
- revenues from non-cable or non-video services including telecommunications services or information services;
- revenues paid by subscribers to home shopping programmers;
- sale of cable or video for resale in which the purchaser is required to collect the 5% fee from the purchaser's customers;
- any taxes;
- the provision of cable service to customers at no charge as required or allowed by a city;
- foregone revenue from provision of free or reduced-cost cable service;
- sales of capital assets or of surplus equipment;
- reimbursement by programmers of marketing costs; or
- directory or Internet advertising revenue.

As to PEG, if the cable or video provider receives a request from a city to provide capacity for PEG access channels, and if it is "technically capable" of providing the capacity, it must do so within 120 days. If no PEG channels were provided as of September 1, 2005, then the provider only has to provide up to 3 channels to a city with a population of at least 50,000, and up to 2 for smaller cities. However, the number of PEG channels shall not be less than the number of PEG channels the city has activated under the terms of any franchise, contract, or other agreement, as of September 1, 2005. Numerous conditions were attached to this requirement:

- Cable or video provider, at its sole discretion, can place any channel on any tier of service after September 1, 2005;
- Except, city can designate up to 3 PEG channels (or 2 if a smaller city) to remain on the lowest service tier for which no equipment is required to receive the channel;
- BUT, if service is only digital service, then PEG channels will be available in digital format;
- Provision of initial access channel and continuation of provision of pre-existing access channels subject to usage and programming minimum hours (40% of 12 hours of programming for each business day on average over each calendar quarter must be non-repeat programming – rises to 50% if city is entitled to 3 channels);
- All costs of construction to be borne by city;
- Operation of the PEG channels is the responsibility of the city;
- Any PEG channel not utilized for at least 8 hours/day will not be available to the city until city can certify a schedule of 8 hours/day of daily programming, but no obligation of provider to carry the channel on a basic or analog tier.

How about I-Net? If an I-Net was being provided prior to termination of the franchise by the provider, then the provider would be required to continue to provide the same I-Net capacity, provided the city compensates the provider at its actual incremental costs for such capacity.

How about free cable services to schools? If provided prior to termination, then they must continue to be provided to the same extent.

How about facilities relocation? The committee substitute added procedural requirements into the mix: the providers get to “vet” the city’s designs and plans; the providers get to offer “potential design alternatives” to avoid facility relocation or minimize relocation costs; if the city rejects an alternative design it must give written reasons for doing so. The bill also adds a provision that the cost of burying existing aerial facilities is not a “public improvement project,” meaning the city would bear the entire cost of such a relocation. Only relocations for the purpose of widening or straightening streets are to be paid for by the provider; other relocations are at the city’s cost. The city can recover its costs if it complies with the following:

- Within 90 days of the effective date of the section and before September 1 of every year thereafter, cities with public improvement projects planned for the next year that *may* involve facility relocation at the city’s expense, have to initiate a planning process;
- Upon request, the providers must tell the city the total number of linear feet of right-of-way they occupy, their forecasts for costs associated with relocation for the next calendar year, and route maps showing general location of facilities;
- City issues its findings on the total amount of linear feet currently occupied or maintained by all providers, total amount of linear feet occupied by each provider, total average amount of relocation costs projected, per linear foot cost of facility relocation (total projected costs of all providers divided by total amount of linear feet occupied by all providers), and setting a fee for the next fiscal year;
- After 1/1/06, city may adopt an ordinance for the collection of facility relocation fees from each provider operating in the city;
- Each provider pays the annual relocation fee based on amount of linear feet occupied;
- City can assess fee only if it has public improvement projects budgeted for the next fiscal year and must true-up its costs annually.

How about fees for use of rights-of-way? City can assess a fee not to exceed \$100 as compensation for the use and management of rights-of-way.

Customer service requirements? The FCC’s customer service requirements must be complied with *until* there are more than two providers offering service, including satellite services.

Mandatory build-out? No requirements for mandatory build-out can be imposed.

Regulation of cable service? A city’s authority to regulate a cable or video provider is limited to requiring the provider to register with the city, to establish reasonable guidelines for the use of PEG channels, and to require reports within 30 days on compliance with customer service standards *if* the provider has “continued and unresolved customer service complaints indicating a clear failure on the

part of the provider to comply with the standards.” If these reports are not provided, are incomplete, or verify noncompliance, the city can file “an appropriate proceeding in the municipal court.”

Police powers? City can exercise nondiscriminatory police powers regarding use of rights-of-way, but cannot require any monetary compensation, non-monetary compensation, facilities, value, in-kind support, free service, or other thing of value for the right or privilege of providing service or using the public rights-of-way.

The bill also requires the PUC to conduct a study and file a report with the legislature by September 1, 2006. The study is to contain the PUC’s revenue-neutral, technology-neutral, and competitive-neutral recommendations concerning compensation flowing to the cities from voice, video, and cable providers. The report is to identify the following:

1. all sources of compensation that have been received by the cities historically from providers of voice, video, and cable;
2. the providers of voice, video and cable services available to consumers within cities without regard to the technology used to deliver the services;
3. alternative funding mechanisms, including an additional municipal sales tax or any other additional municipally-imposed alternatives, which would be revenue neutral to the cities, and technology-neutral and competitive-neutral in application to providers, their services, and their customers; and
4. the payment mechanism of the fees, including all municipal fees and franchise fees.

The sponsor of HB 3179, Rep. King of Parker County, was also the sponsor of the House’s PUC sunset legislation, HB 1779. Both HB 3179 and HB 1779 were scheduled for House floor action on May 12, 2005, the last day for a House-originated bill to be voted on and sent to the Senate. When HB 1779 was called up, several amendments were attached before the bill was postponed until later that day. When it was called up again, Rep. King attempted to amend it by tacking on the provisions of HB 3179. A point of order was called challenging the amendment as not being germane to the subject matter of the bill (*i.e.*, the continuation of the PUC under sunset provisions). The point of order was withdrawn, but the consideration of the bill was postponed until later. The Speaker refused to bring HB 1779 up, and it effectively died. HB 3179 was not voted on, so it died, too.

The next effort to get the HB 3179 provisions passed was to attach them to SB 408, the Senate PUC sunset bill. A committee substitute for SB 408 containing those provisions, and a pre-filed amendment to SB 408 that is essentially HB 3179, was considered by the House on May 18, 2005. Rep. King introduced the amendments as “perfecting amendments” that simply attached all the amendments that were approved to HB 1779 before the point of order was raised on that bill. A point of order on SB 408 was raised by Rep. Talton, claiming that the amendments were not germane and changed the original purpose of the bill (which was to continue the PUC). The point of order was sustained, and HB 408 has been sent back to committee. Its future as of this writing is uncertain.

What’s happening in the Texas Legislature with regard to BPL?

SB 1748 by Fraser was passed by the Senate and is pending in the House Regulated Industries Committee (as of 5/18/05). A committee substitute has been offered. As passed by the Senate, SB 1748 would add a new chapter 43 to the Utilities Code. It declares the deployment of BPL to be in the

public interest, and each electric utility should be encouraged to construct, maintain, and operate BPL systems, although they should not be required to implement BPL. SB 1748 would apply to electric utilities, whether or not they are offering customer choice under Chapter 39 of PURA. (It should be noted that municipally-owned utilities and electric cooperatives are not included within the definition of “electric utility” in PURA. As defined in the bill, “electric utility” includes an electric utility and a transmission and distribution utility as defined in Section 31.002(6) or (19).)

This bill would allow an electric utility to allow another person, including an affiliate, to own, construct, maintain, and operate a BPL system and provide BPL services on its electric delivery system. The BPL operator will determine what BPL Internet service providers can have access to broadband capacity on the system. If any of the BPL system is installed on facilities owned by a telecommunications utility, the owner of the BPL system must pay the telecommunications utility an annual fee consistent with “usual and customary charges for access to the space occupied by that portion of the installed BPL system.” The bill also requires the electric utility to charge the owner of the BPL system for the use of the electric delivery system.

Neither the PUC nor any state or local government or other regulatory authority can do the following:

- Require an electric utility to install a BPL system or offer BPL services;
- Require an electric utility to allow others to install a BPL system;
- Prohibit an electric utility from installing a BPL system or offering BPL services;
- Require a franchise or an amendment to a franchise or impose or collect a charge, fee, or tax from any entity for the use of right-of-way for a BPL system or for the provision of BPL services, unless the city is not already collecting a charge or fee from the electric utility for the use of the right-of-way to serve retail electric customers; or
- Impose any charge on the provision of BPL services that is greater than the lowest charge imposed on other providers of Internet services.

If an electric utility permits the installation of a BPL system on its electric system, the provision of BPL utility applications and other BPL services consumed by the electric utility shall be eligible for inclusion as operating expenses for purposes of any rate proceeding. The PUC will determine just and reasonable charges for access to the space occupied by the BPL system and the use of other utility facilities by the BPL system.

Municipalities would not have any jurisdiction over the BPL system, BPL services, or the rates, operations, or services of the electric utility to the extent such rates, operations and services are related, in whole or in part, to the ownership, construction, maintenance, or operation of a BPL system used to provide BPL services to affiliated or unaffiliated entities. The bill deems the installation of a BPL system to be consistent with the installation of an electric delivery system, thereby prohibiting the requirement that the BPL system obtain easements of other rights-of-way or pay additional consideration for the placement of the BPL system.

The committee substitute for SB 1748 would also allow the utility itself to own and maintain a BPL system and offer such services. Additionally, the committee substitute addresses cost recovery issues, and provides that where an electric utility owns or permits the installation of a BPL system on

its electric delivery system, the utility's investment in the BPL system shall be deemed used and useful in providing service and eligible for inclusion in the utility's invested capital, and any fees or operating expenses related to that BPL system shall be eligible for inclusion as operating expenses. However, just and reasonable charges for the use of the utility's electric delivery system by a BPL owner or operator shall be limited to the usual and customary pole attachment charges paid to the utility for comparable space by cable television operators. Revenues of an affiliated BPL operator or an affiliated BPL ISP shall not be deemed the revenues of a utility for the purpose of setting rates.

Here's the real zinger in the substitute bill: Any utility that installs or allows the installation of a BPL system may elect to provide electric transmission and delivery services under the rates it had in effect on January 1, 2005. Once the utility notifies the PUC of its election to do so (by December 31, 2006), it will thereafter not be subject to the other provisions of subchapters C and D of Chapter 36 until September 1, 2010, and during the rate freeze period cannot include its investment in the BPL system in rates or otherwise seek to change its rates, except for reasons of force majeure. Subchapters C and D of Chapter 36 contain general procedures for rate changes proposed by utilities and by regulatory authorities. During this "freeze period" the PUC shall allow the utility that has made this election to adjust its distribution service provider transmission cost recovery factors, adjust its transmission cost of service rates to reflect changes in its invested capital, implement any rider or surcharge necessary to collect or refund increases or decreases in municipal franchise fees, implement or adjust a competition transition charge, or other fees, and implement additional tariffs for new or expanded electric delivery or utility services. One could certainly ask the question – why would any utility want to freeze its current rates for 10 years, unless those rates are already too high?

What's happening on the federal level?

Pertinent definitions in the federal statute are as follows:

"Telecommunications" means the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.

"Telecommunications service" means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used.

"Information service" means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operations of a telecommunications system or the management of a telecommunications service.

- ***Petition for Declaratory Ruling that pulver.com’s Free World Dialup is Neither Telecommunications Nor a Telecommunications Service***, WC Docket No. 03-45, Memorandum Opinion and Order, 19 FCC Rcd 3307 (2004).

The FCC has decided that pulver.com’s Free World Dialup (“FWD”) offering was an unregulated information service subject to the FCC’s (and not the states’) jurisdiction. Thus begins the FCC’s policy of non-regulation of Internet based services. Pulver had argued that FWD was not a telecommunications (no transmission capabilities were provided), was not a telecommunications service (not providing telecommunications and not charging for the FWD service), and was not an information service (FWD provides no data transport). The FCC agreed about the telecommunications and telecommunications services, but said FWD was an information service because it offers a capability for generating, acquiring, storing, transforming, retrieving, utilizing, or making available information via telecommunications.

The FCC further said that FWD is impossible to separate into purely intrastate and interstate components; therefore, the states have no jurisdiction over this service, and it is also not subject to access charges. The FCC laid out a 5-point test for a voice service to be classified as a unregulated interstate information service: (i) a peer-to-peer voice service; (ii) provided over a broadband network; (iii) that does not employ the PSTN; (iv) used at no charge; and (v) made possible only because the consumers on both ends of the line used their computers to make the call without employment of a traditional phone number.

- ***Petition for Declaratory Ruling that AT&T’s Phone-to-Phone IP Telephony Services are Exempt from Access Charges***, WC Docket No. 02-361, Memorandum Opinion and Order, 19 FCC Rcd 7457 (2004).

AT&T argued that its phone-to-phone IP telephony was an information service and was exempt from access charges because it had a future potential to provide enhanced functionality and net protocol conversion. But, the calls are originated by using a traditional touch tone telephone with 1+ dialing (even though the call used AT&T’s Internet backbone for IP transport), and the call is converted back from IP format before being terminated at a LEC switch, causing the FCC to rule that such service is a telecommunications service. AT&T’s use of the Internet was said to be merely a transmission medium but did not “harness the Internet’s broader capabilities.” Thus, the transmission medium does not dictate the classification of services as telecommunications or information, and it is reasonable to require AT&T to pay the same access charges as other providers who use the PSTN.

- ***In the Matter of Vonage Holdings Corporation Petition for Declaratory Ruling Concerning an Order of the Minnesota Public Utilities Commission***, WC Docket No. 03-211, Memorandum Opinion and Order, FCC 04-267 (2004).

The FCC was confronted with an order by the Minnesota Public Utilities Commission applying that state’s telephone regulations to the DigitalVoice service of Vonage. The FCC preempted the PUC order, holding that the VoIP service offered by Vonage could not be separated into intrastate and interstate communications. The FCC did *not*, however, explicitly state whether the VoIP service was an information service or a telecommunications service, deferring to the pending IP-Enabled Services Proceeding. The FCC said that the same preemption would be applied to technologically similar offerings. A number of parties have appealed this FCC order. Cases will be consolidated in the 9th Circuit, where the first appeal was filed.

- ***In the Matter of Level 3 Communications LLC's Petition for Forbearance Under 47 U.S.C. § 1.53 of the Commission's Rules from Enforcement of Section 251(g), Rule 51,701(b)(1) and Rule 69.5(b)***, WC Docket No. 03-266.

Level 3's petition for forbearance requests the FCC to not enforce its rules to the extent such enforcement would permit LEC's to impose interstate or intrastate access charges on IP to PSTN traffic and on certain PSTN-to-PSTN traffic that is incidental thereto. There has been no ruling yet by the FCC.

- ***IP-Enabled Services NPRM***, WC Docket No. 04-28, FCC 04-36, Notice of Proposed Rulemaking, 19 FCC Rcd 4863 (2004).

This rulemaking proceeding is set to tackle the regulatory status of IP-enabled services generally, and issues such as universal service, intercarrier compensation, 911/E911, consumer protection, disability access, numbering, and the extent to which states have a role in such matters. The FCC will also consider whether it should continue and expand its hands-off attitude toward information services. The Notice of Proposed Rulemaking ("NPRM") includes several strongly worded statements indicating that the FCC believes that these services should not be subject to legacy economic regulation. Instead, these services should only be subject to minimal, narrowly tailored regulation necessary to implement important public policy goals, such as 911, disability access, universal service and consumer protection.

- ***In the Matter of Communications Assistance for Law Enforcement Act and Broadband Access and Services***, ET Docket No. 04-295; RM-10865, Notice of Proposed Rulemaking and Declaratory Ruling, 19 FCC Rcd 15676 (2004).

In this NPRM, the FCC has tentatively concluded that IP service providers are subject to the provisions of CALEA (requirement that networks be designed to facilitate trap and trace and wire tap functionality). This requirement is imposed notwithstanding that the FCC has otherwise held that IP service providers are offering information services for purposes of the Communications Act. The FCC tentatively concluded that facilities-based providers of any type of broadband Internet access service provide a "replacement for a substantial portion of the local exchange telephone service used for dial-up Internet access service" and treating them as telecommunications carriers for purposes of CALEA is in the public interest.

This looks like a classic case of *Goose v. Gander*: The FCC has said that as a matter of policy, it believes that any service provider that sends traffic to the PSTN should be subject to similar compensation obligations, irrespective of whether the traffic originates on the PSTN, on a IP network, or on a cable network. The cost of the PSTN should be borne equitably among those that use it in similar ways. Taking the next logical step, any provider that uses the public rights-of-way should be subject to similar compensation obligations, irrespective of what the traffic is (video, voice, or data) because the cost of the right-of-way should be borne equitably among those who use it in similar ways. But the FCC has not taken the next logical step.

- *In the Matter of Petition of SBC Communications, Inc. for Forbearance from the Application of Title II Common Carrier Regulation to IP Platform Services*, MC Docket No. 04-29, Memorandum Opinion and Order, ___ FCC Rcd ___ (2005).

The FCC denied SBC's petition requesting the FCC to forbear from imposing Title II (telecommunications) regulations to IP platform services. The FCC found the petition to be procedurally defective because it asked the FCC to forbear from the application of statutory provisions and regulations that "may or may not" apply to the telecommunications carrier or telecommunications service at issue. SBC admitted in its petition that the FCC has not yet decided the extent to which IP-enabled service are covered by Title II and its implementing rules.

What does all this mean for cities?

As you would expect, providers of these advanced communications services are interested in providing more of the services, in being all things to all people, and in avoiding as much regulation as possible. As a result, many of the providers are looking at branching out into services that used to be clearly separated by providers. This "triple play" involves (usually) the bundling of services to customers, and possibly discounting one or more of these services in order to entice customers to purchase multiple services.

In addition to the regulatory issues involved with the delivery mode of these services, such as the requirement for a local franchise, there are impacts upon the revenues received by cities through franchise fees. When a cable television provider, who is paying 5% on cable services, determines that it will also provide telecommunications services, then under present law (as of this writing), the provider is also liable for the payment of access line fees under Chapter 283 of the Local Government Code.

The cable franchise fee revenues are probably much more significant to the city than the access line fees paid by the cable provider. So, what happens when the cable provider determines that it is going to discount its charge for cable service in order to entice more cable customers to also purchase their telephone service from the cable company? If cable television rates drop from \$40 to \$25 when phone service and Internet access services are also purchased, will franchise fees paid to the city necessarily drop as well? If a cable franchise does not address this issue, the city may find that its cable franchise fee receipts are dropping at the same time that subscriber levels are either staying level or increasing and additional services are being provided through the physical facilities in the rights-of-way.

It is a very difficult matter to address in a franchise, as cable providers are unwilling to allow the city to dictate their business practices or to mandate accounting procedures that would require allocation of subscriber revenues in a manner that first allocates revenues to the full price of cable services. Yet, if left unaddressed, the city would have little ability to demand that revenues be reallocated in any particular manner. Clearly, at franchise renewal time or at any time during the term of the franchise, there needs to be a frank discussion between the city and the cable provider regarding the city's expectations that the compensation it receives from the cable provider will not be artificially reduced by any unfair or unreasonable allocation of revenues by the provider to services that are not subject to franchise fees. The discussion should be documented, if possible, in the renewed franchise. If it is not renewal time, the city should consider requesting the franchisee to amend the franchise to clarify the parties' intent with regard to bundled services.

The provision of video, voice, and data by Internet-enabled or wireless technologies is, no doubt, the wave of the future. As more customers migrate to wireless services, it is unavoidable that cities will suffer reduced franchise fee revenues as a result. The migration of voice, video, and data to IP-enabled technologies will also have drastic results for cities if the definitions of these services continue to be tied to the mode of delivery. The FCC has decided that cable modem service is not a cable service, but rather is an information service. The 9th Circuit Court of Appeals, on appeal, held that the transmission component of cable modem service is actually a telecommunications service, while the information transmitted is an information service. Oral arguments in the *Brand X* case were held at the U.S. Supreme Court in March 2005. The Court has an opportunity to provide either clarity or further obfuscation of whether services will be classified based upon their content, their functionality, or their mode of delivery.⁸

⁸ *Brand X Internet Services, Inc. v. Federal Communications Comm'n*, 345 F.3d 1120 (9th Cir. 2003), cert. granted (U.S. Dec. 3, 2004)(No. 04-277 and 04-281).