America's New Communications Hubs

How the Telecommunications Act of 1996 Has Revitalized the Nation's Cities

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Night after night for the last two years, a familiar routine has played itself out on the streets of Manhattan. As the cross-town traffic bleeds out through bridges and tunnels, non-descript vans fan out across the city, setting up shop over manhole covers that provide access to the tunnels below. Workers, with a rare sense of urgency among New York City street crews, busily gather the equipment they'll need to push fiber optic cable through the 4-inch conduits that line the gridiron of Manhattan's street system: air-compressors, nozzles, flares, and flashlights. Meanwhile, in old buildings along the West Side Highway that once housed the presses of Manhattan's publishing industry, construction crews work through the night installing diesel generators, high-capacity air conditioning units, and car-sized backup batteries in order to bring a new Internet data center online.

This scene is just one example of a phenomenon that is transforming cities across the entire nation. Competition in the telecommunications industry, spurred by the Telecommunications Act of 1996, is revitalizing America's cities. By phasing out the complex system of cross subsidies which used to force urban businesses to subsidize rural telephone subscribers, and breaking monopolies on local telecommunications markets, the new regulatory environment has let innovative firms forge ahead in building a new communications infrastructure for the 21st Century. Over the last two years, a fundamental physical transformation has taken place in metropolitan America. A nearly invisible construction project involving thousands of buildings, tens of thousands of workers, and hundreds of thousands of miles of fiber optic cable, has silently built a new communications infrastructure for North America.

The pace of construction has been spectacular. Between 1990 and 2000, capacity on international undersea fiber optic cables linking the world's cities increased some 225 times.[1] Long haul inter-city networks in North America grew from 2,085,000 fiber strand miles to over 3,500,000 miles between 1990 and 1998.[2,3] It is estimated that private firms such as AT&T, Sprint, and Qwest had $17 billion invested in long-haul network capacity in 2000, to rise to $30 billion in 2002.[4] Within cities and their surrounding suburbs, incumbent local exchange carriers (ILECs – the old Bell companies) and competitive local exchange carriers (CLECs – new upstarts like RCN) have built over *15 million miles* of fiber to link telephone switches and office buildings into broadband metropolitan communications grids.

Yet little attention outside the telecommunications sector has been paid to the massive investment in physical infrastructure that is needed to support the many connections made possible by the Internet. The hype of the Information Economy's 'plenty' – cheap technologies for processing and transmitting information – often obscures the painstaking decisions that firms must make regarding the infrastructure necessary to support millions of Internet users. Some pundits claim that Internet traffic is doubling every sixty days, and even the

most conservative estimates are that it doubles annually. The current infrastructure simply cannot support these massive new loads.

Contrary to futurists who predicted urban decline in the Information Economy as Internet use and data communications continued to grow (thereby enabling an exodus to less populated suburban and rural areas), new urban communications hubs are providing the expansion base for the future Internet. Just as cities served as hubs in the era of ship (New York), rail (Atlanta), and air transport (Chicago), cities now serve as hubs for the information infrastructure. Laying fiber optic cable requires enormous up-front investment, and thus it makes sense to build in the biggest markets first. In fact, as Table 1 shows, the cost of bandwidth is still very sensitive to distance.

Table 1. Sample Bandwidth Rates from New York City

Destination	Capacity[1]	Per Unit Price ($ per Mbps per year)
Washington	2.5 Gbps	148
Washington	622 Mbps	401
Washington	155 Mbps	564
London	2.5 Gbps	1,162
London	155 Mbps	2,323 – 2,510
Dublin	2.5 Gbps	5,250
Dublin	155 Mbps	5,758
Paris	155 Mbps	10,510
Frankfurt	155 Mbps	10,510
Milan	45 Mbps	12,222
Vienna	45 Mbps	16,222
Prague	45 Mbps	16,222
Tokyo	45 Mbps	40,644
Hong Kong	2 Mbps	144,640

Source: Compiled by author from listings Band-X Online Bandwidth Exchange. [http://www.band-x.com]

1 Gbps (gigabits per second) = 1,024Mbps (megabits per second) = 1,048,576 Kbps (kilobits per second). 1 Gbps is approximately 19,750 times the capacity of a typical 56Kbps dial-up modem connection.

Businesses that locate in major world cities have always done so to minimize their costs of travel and recruiting by minimizing their distance from other companies and the worker base. Many futurists in the 1990s forecast that the proliferation of bandwidth would undermine the economics keeping cities together. Not only were they wrong about the death of cities, but it appears that central city and metropolitan economies are stronger than ever. In fact, advanced telecommunications hubs complement the knowledge-based industries that drive cities by providing an infrastructure to export their valuable ideas and services.

There are four components of the nation's new communications infrastructure. These components serve similar functions for production, storage, and distribution in the Information Economy that earlier infrastructures did for industrial and mercantile economies. These four components are:

- *Information highways* – the transcontinental and undersea fiber optic lines which move data at light speed from city to city.
- *Information ports* – the neutral, third-party sites where communications carriers interconnect their systems into a single, global network. Also called 'carrier hotels' or 'telco hotels'.
- *Information warehouses* – the secure, climate-controlled structures which house row upon row of communications equipment, such as Internet servers and switches. Also call 'data centers' or 'co-los'.
- *Information factories* – the broadband-ready offices and homes which produce and consume the nation's information products.

These components of the nation's new information infrastructure are the result of tens of billions of dollars of private investment in the five years following the Telecommunications Act of 1996. This investment will provide a solid foundation for economic growth in America's cities and metropolitan areas for decades to come.

However, some cities are not receiving any investment in new communications facilities at all, and are at great risk of being left behind in the race to get "wired". In the United States, Detroit, Cleveland and Philadelphia are among a number of large cities that lack a comparable telecommunications capacity. The new Administration needs to address this geographic "Digital Divide," which has left entire cities, neighborhoods, and communities behind in the Information Economy. While downtown businesses can choose from dozen of competing carriers, smaller businesses are often bypassed or neglected. Through incentives and assistance programs, much can be done to foster the diffusion of this new infrastructure to all levels of society, without the need for excessive regulation that might stifle the innovation and competition that has flourished since the reforms of 1996.

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This article is based on the new report, America's New Communications Hubs: How Competition In The Telecommunications Industry Is Revitalizing America's Cities, which will be released on February 25, 2001. It will be available exclusively through the Taub Urban Research Center website at http://www.informationcity.org.

Endnotes

[1] *International Bandwidth* 2000. Telegeography, Inc., Washington, DC.

[2] A fiber-strand file indicates a single optical fiber running for one mile. Other commonly used measures of fiber deployment are the sheath mile and route mile, which offer no indication of potential transmission capacity.

[3] *Fiber Deployment Update, End of Year 1998.* Federal Communications Commission, Common Carrier Bureau, Washington DC.

[4] "Multimedia Telecommunications Market Review and Forecast". Multimedia Telecommunications Association [http://www.mmta.org/research/forecast.cfm].