TELEPORT CONCEPT: A LOCAL TELECOMMUNICATIONS CARRIER REALITY?

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• Teleports are expected to offer, on a shared basis, products and services aimed at meeting the present and future needs of potential corporate users. These offerings are of "building block" nature, with the partitionable digital PBX (Private Branch Exchange) as the backbone of the data- and voice-intensive communications body.

• Thus developers have married the telecommunications and data processing requirements of potential tenants to the opportunities available through enhanced real estate. The three major components which expand telecommunications-enhanced real estate into a teleport project are: Satellite Earth Stations, Optical Fiber Network, and the Communications Center.

• Communications users would find voice and data communication services in three categories: on-premise tenant services, the interconnect to local fiber network, and the interconnect to satellite facilities.

• There are four major players in teleport development: the real estate developer, the investment capitalist, the communications manager, and the public sector. Each has a major role in the design and implementation of such a project.

• Any related legal or regulatory issues and their resolutions are difficult to predict; there have been no statutes, cases, or regulations directed to teleport development.

* The potential for bypass offered by the teleport is a major issue affecting the local telecommunications carrier (LTC); the ability to provide local service without the need for access to the facilities of the LTC is an important feature in teleport design. The teleport offers two types of bypass: local bypass and long-haul access bypass.

* Teleport as an emerging business opportunity will inevitably pose a threat to the LTC. Local, state, and federal regulation will largely determine the extent and significance of this threat.

Preface

Teleports are new. Like many new things in the communications business (and for that matter many old things), it's not at all clear even what they are.

The Program has taken simultaneous approaches to the subject, one broad and others narrow.

The broad approach is a description of the entire communications and information scene from which teleports emerge. Our findings are reported in the collection of all our publications. For someone wishing to pursue the topic less broadly and in some depth, our writings on costs and prices in the telephone industry describe many of the issues.

One alternative approach is that taken by this paper. It surveys existing teleport activities. We describe teleport developments through late 1984, the players, their apparent stakes, and some of the regulatory issues. Were this paper to be written two or three years hence, there would no doubt be an opportunity for analysis of what has happened and what is happening. The background is not available for such analysis at this time.

If teleports continue, so will our interest. We are always glad to hear from our affiliates and others who read these documents. Your comments would be appreciated.

John C. LeGates

1. Introduction: Teleport Possibilities

Those players interested in developing the teleport concept have described it in a number of ways, most commonly as a satellite antenna farm set in a frequency-interference-free area which is linked by fiber optic cable to a metropolitan area. Satellite antenna farms are located in such areas to allow for full-power access to any satellite system. Voice and data traffic on the local or regional trunk is carried out to satellite dishes for long-haul transmission. One or a number of specialized long-haul carriers will provide this interexchange service. The teleport operator may own the actual satellite dishes and then lease them to long-haul common carriers as tenants of the teleport. Earth stations will access both domestic and international satellites. A teleport operator may provide the local loop, as in the high-capacity fiber optic cabling provided by Western Union in its participation as a partner in the New York Teleport (this partnership will be discussed later). However, a teleport developer who provides these local loops may require the participation of a local telecommunications carrier (LTC).

Thus teleport's business potential has suggested a more sophisticated concept than that of an antenna farm. Developers have married the telecommunications and data processing requirements of potential tenants to the opportunities available through "enhanced"[1] real estate. A teleport tenant through a rental or leasing arrangement would have available a number of telecommunications and data services. The "enhanced" building would have access to facilities such as satellite earth stations, digital

1. For this paper, the author defines the bundles of telecommunications services added to real estate projects as "telecommunications-enhanced real estate." To create a "teleport," such telecommunications-enhanced real estate would offer satellite earth stations, optical fiber network, and the communications center.

microwave, local two-way cable, teleconferencing, and on-premise computer services. An antenna farm may not be located on the premises of enhanced real estate in order to define that project as a teleport.

Teleport publicity has largely focused on the Staten Island, New York, project which the Port Authority of New York and New Jersey, Merrill Lynch & Company, and the Western Union Corporation are developing to provide the metropolitan area with satellite communications.[2] Another important but not often mentioned partner in this venture is the City of New York. Planners of the New York Teleport will build an office park around the antenna farm. Other teleport developments in locations such as Columbus, Ohio; Alemeda, Ca.; Boston, Ma.; Dallas, Texas; or Chicago, Ill. may or may not have antenna farms but do offer the "enhanced" real estate with satellite access. Each teleport will offer, to tenants, services "tailor made" to meet specific telecommunications and/or data applications.

An LTC may become involved in a teleport in two ways, whether the teleport is an antenna farm or an "enhanced" piece of real estate. The LTC may provide inside wiring or, more importantly, may provide the local loop. As in the New York teleport where Western Union provides local-loop access to users, developers have taken the "bypass" opportunity.

The definition of bypass is more specific than that of the teleport concept. Despite the growing use of the term, the Federal Communications Commission has not formally defined bypass. Bruce C. Netschert has described bypass as the capability of interexchange carriers and other

2. Andrew Pollack, "Role of Telecommunications In Industrial Planning Grows," The New York Times, May 2, 1983, p. 1.

entities to provide long distance or even local service without using the local telephone company's local loop.[3] The intercity voice and data services offered by the teleport users (special common carriers) must use the local loop, provided by an LTC or another provider, to make the last-mile connection to the end user. The potential to bypass the LTC local loop is growing for technical and economic reasons. Because of the traditional rate structure for access to the local loop as well as its current technical limitations for data transport, many users of telecommunications services are starting to investigate ways to bypass the local exchange.

Indeed, local distribution has been called the weak link and next frontier in the development of new communications services.[4] A teleport can be viewed as a vehicle to utilize bypass technologies such as microwave satellite communications, fiber optics, and cable television. Thus far the bypassing has occurred on a small scale relative to total BOC (Bell Operating Company) traffic. As technological progress continues, the new emphasis on competition in telecommunications regulation will encourage the development of new technologies for bypassing; and, as the technologies develop, their costs will come down. The long-range potential clearly exists for the capture of a substantial portion of the BOC traffic through bypassing.[5]

The LTCs, with their plant investments, technologies, and service capabilities already in place, are threatened by the bypass opportunities of the teleport developers. The teleport developer requires substantial

3. Bruce C. Netschert, "The bypass threat -- and what to do about it," Telephony, July 18, 1983, p. 113.

4. J. L. Charter, D. N. Hatfield, R. K. Salaman, "Local Distribution -- The Next Frontier," National Telecommunications and Information Administration (NTIA-TM-81-54), April 1981.

5. Netschert (see Note 3).

capitalization to provide local loop distribution and must weigh carefully the risk involved in providing a bypass alternative to the existing LTC network. Still, developers are responding to anticipated market needs which may encourage investment in bypass alternatives at any risk.

The teleport is a synergistic product, allowing the developer to package, potentially profitably, the most attractive components of real estate and telecommunications services. Merrill Lynch Vice President Stanley Welland stated in The New York Times that "You don't just look to bypass the common carriers . . . . We want to marry all of the available services and technologies and keep up with the state of the art."[6] In considering the form a teleport will take, the developer must evaluate both market and capitalization requirements.

6. Robert A. Bennett, "Citicorp's Satellite Challenge," The New York Times, March 24, 1983, p. 1.

2. Origins of The New York Teleport

Before the development of the New York Teleport, the New York and New Jersey business community claimed that it was incurring high communications costs, especially in transmitting high-volume data to other corporate locations on either an intra-city, inter-city, or international basis. Merrill Lynch, a large-volume data user, was seeking alternative transmission facilities to decrease its high communications costs estimated at $100 million to $120 million per year. Not only were the transmission costs high, but the transmission quality was not ideal: Transmission was subject to interference -- the area was overloaded with microwave radio traffic so that few or no bands were available in or out of the city. The business community also contended with many structural blockages for transmission, which in turn gave way to high costs of construction, engineering and real estate. In sum, a variety of factors convinced Merrill Lynch to investigate a facility such as a teleport.

In 1977, the Port Authority of New York and New Jersey participated with the National Research Council in a study entitled "Telecommunications for Metropolitan Areas, Near-Term Needs and Opportunities." The study results indicated two goals for the Port Authority in a teleport undertaking. Of primary importance, the New York and New Jersey metropolitan area must maintain its preeminent position in communications technology; second, area business and government must prevent continuing erosion of industry from the region.[2]

In his testimony to the N. Y. State Public Service Commission, March 15, 1984, the Port Authority's Joseph Milano, Manager, Communications

2. John F. Naughton, "Designing Urban Telecom Networks: 'The Teleport'," Telecommunications, September 1983, p. 139.

Technology, stated that the objective of the telecommunications satellite park was to aggregate common carrier facilities, privately shared earth station systems, and fiber optic distribution systems with an efficiency similar to that of a major public airport. A highway access system would be part of the project. Common carriers and major users would benefit from lowered costs and from these services, which otherwise would be possible only with traffic and market concentration.[3]

As a next step, the Port Authority asked COMSAT General Corporation to investigate possible frequency-interference-free sites in the metropolitan area that might lend themselves to such a teleport project. The particular location, also, would have to be available for development, be easily accessible to major highways, and have an available labor pool. The current Staten Island location was the chosen site over 29 others. After investigating the feasibility of the project, COMSAT chose not to pursue the teleport project with the Port Authority.

The Port Authority of New York and New Jersey then authorized the consulting firm of Arthur D. Little, Inc., to conduct a marketing study of the teleport idea, with a final report due in six months.[4] The study was to examine local business demand for a teleport facility. At this point Merrill Lynch, under the leadership of Gerald Eli, involved itself with the Port Authority.

Two roles had emerged in the teleport venture: Port Authority as the area developer with the intent to increase or at least maintain commerce in the metro-region and Merrill Lynch as the investment capitalist with interests in enhancing its position in the financial community. They then

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3. Joseph Milano testimony at bypass hearings are recorded in New York State Public Service Commission Case 28710, "Proceeding on Motion of the Commission as to the Provision of Telephone Services that Bypass Local Exchange or Toll Networks," instituted December 20, 1983.

4. David Bird, "Teleport Proposal Under Study by Port Authority," The New York Times, October 12, 1980, p. 56.

sought a partner with experience in communications management -- Western Union. Welland cited Western Union's "engineering excellence" and the large number of satellite transponders in use at the time as reasons for the selection. "It seemed to be a perfect harmony and synergy between the folks at Merrill Lynch and Western Union," Welland said.[5]

Western Union's and its partner's roles in the Teleport will be threefold: first, construction, implementation, and management of the communications facilities for the Teleport; second, carrying out of associated operations and maintenance; and third, marketing of related telecommunications services.[6]

The two companies would form Teleport Communications, which has an agreement with the Port Authority and the City of New York to manage the project. The City of New York remains the owner of the property and thus under a 40-year lease with the Port Authority (similar to the arrangements with airports and piers) receives a guaranteed net share of the revenues and tax payments. The involvement of the City of New York in the New York Teleport will be an important factor in the city's future influences on the telecommunications infrastructure and resulting business location and expansion decisions.

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5. John F. Naughton (see Note 2), p. 140.

6. Ibid.

The events and participants involved are not unique to the New York Teleport, as Table 1 suggests:

Table 1. New York Teleport Players and Roles.

Player	Major Role
Developer (N.Y. Teleport–Port Authority)	- responsible for site preparation and construction - financing of roads and site
Investment Capitalist (N.Y. Teleport–Merrill Lynch)	- equity partner in telecommunications services to end users
Communications Manager (N.Y. Teleport–Western Union)	- act as telecommunications coordinator - joint venture partner in N.Y. teleport in equity position of telecommunications services
Municipality/Public Sector (N.Y. Teleport–City of New York)	- lease-holder of development property

3. The New York Teleport Project

The New York Teleport project claims that, if developed, it will meet the future communications needs of businesses located in the metropolitan area of New York and New Jersey. The Teleport will consist of three integrated parts: the office park, the satellite antenna farm, and the intra-region fiber optic network. (See Figure 1.)

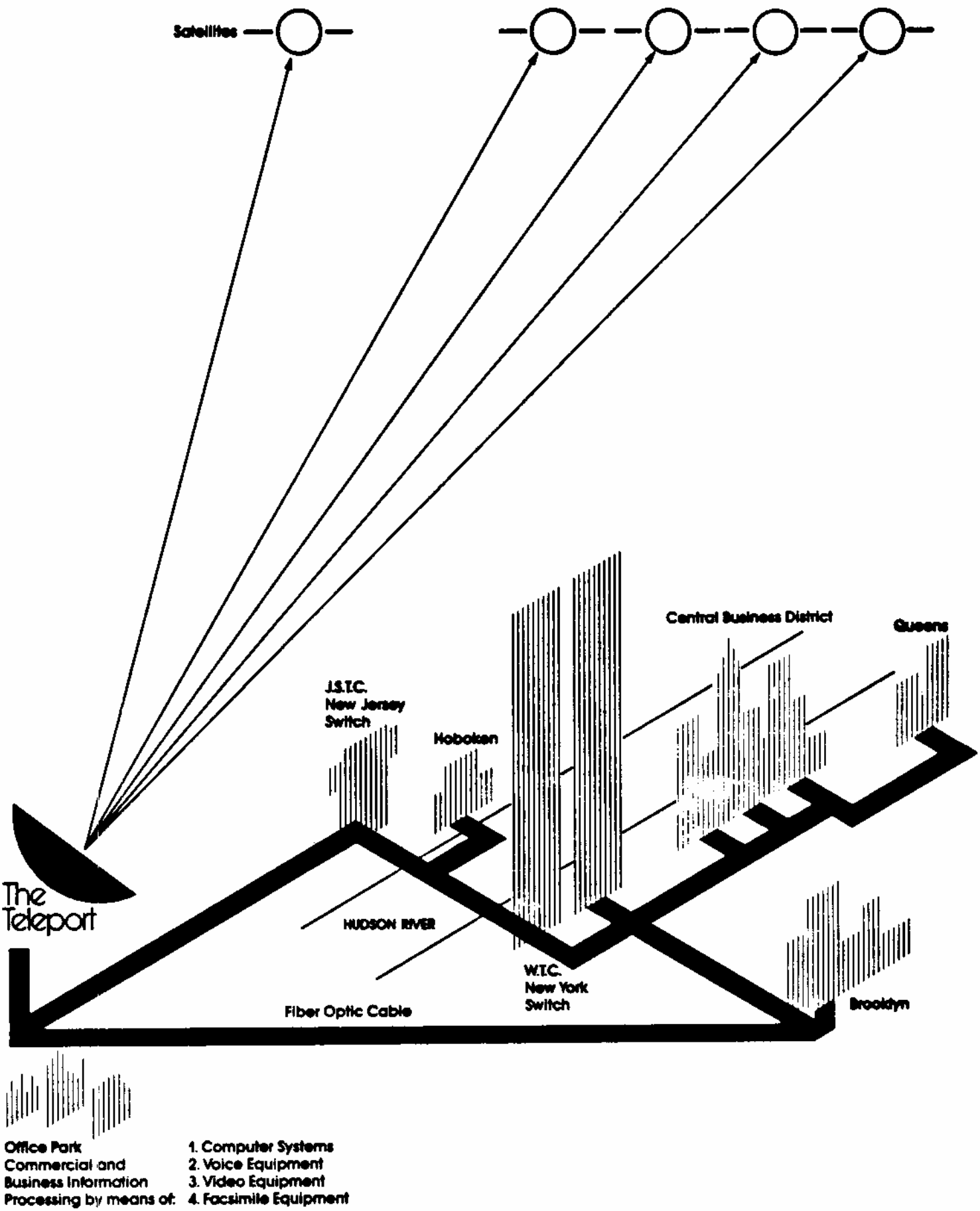
The Office Park

The Staten Island site was chosen primarily because it is radio-frequency free. Other important factors were its accessibility by major highways, its transmission capabilities, its proximity to Manhattan and New Jersey, its available labor pool, and, of course, its availability for development. With a total of some 350 acres of vacant undeveloped land available, only 200 acres will be used for the office park. The remaining 150 acres will remain wetlands.

The office park will consist of 10 three-story structures of 100,000 square feet each. Approximately a third of each building will be used for computer facilities. Leased by private brokers on behalf of the Teleport, buildings will be available for single or multiple tenants. Shared computer facilities will be available for buildings with multiple tenants. The Port Authority will also provide land leases for private development.[1]

Teleport office park tenants stand to save as much as 50% in rental costs by leaving Manhattan for Staten Island, according to Charles G. Seliga, manager of marketing and real estate development for the Port Authority of New York and New Jersey. "The rental rates right now range in the area of $38 to $45 per square foot in lower Manhattan," he said. "When

1. "Smart Buildings," Tech Weekly, June 9, 1983, p. 10.



Source: The Port Authority of New York and New Jersey.

Figure 1. The Teleport Concept.

you get up to Mid-Manhattan, you're in the $55 to $75 bracket. . . . With Teleport, you get a custom designed building, including a raised floor, and we're talking in the low 20's (per square foot)."[2]

Shared tenant services and lower rentals are important factors in the decision to move a business function to the Teleport. Port Authority also has provided two other features to attract tenants, according to Mr. Seliga. There will be a physical and electrical security system designed to satisfy the stringent demands of the financial and communications communities that will be among the prime Teleport clients. The area will be fenced in completely, accessible through a single entrance guarded 24 hours a day, seven days a week. The Port Authority will also deploy its own police force, which has bi-state powers in New York and New Jersey.

In addition, Teleport will do its own on-site electrical distribution, backing that with an uninterruptible power supply system. The primary source of power will be the New York State Grid System, but there will be a substantial backup source. Because the Port Authority is a bi-state agency, it has access to the Public Service Electric and Gas Company's power from New Jersey and the Middle Atlantic Grid System in case the New York State Grid goes down. "Nowhere in the U.S. is there that kind of backup," Seliga said. "And that is something that people have really jumped on as a major item in their decision-making process."[3]

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2. "Teleport-An Office Park Offers Satellite Services to Firms Fleeing New York," Computer World on Communications, September 28, 1983. p. 75.

3. Ibid., p. 78.

The Satellite Antenna Farm

The Staten Island location was chosen out of 29 others investigated because it is relatively free from microwave interference. It will house from 12 to 17 earth stations. Two groups of berms (50-foot earth walls) will protect the earth stations from radio-frequency interference. The facility will be able to handle both C-band and K_u-band transmission. C-band satellites transmit in the 6-GHz range and receive at 4-GHz. According to Welland, C-band is a "nightmare" in most metropolitan areas. But because Teleport's Staten Island location is nearly electromagnetic-interference-free, C-band will be the predominant mode of communication. "It looks like C-band makes the most sense," he said.[4]

K_u-band satellites send in the 12GHz range and receive at 14GHz. Not affected by competing signals, they are attractive for metropolitan use.

However, K_u-band also has its weaknesses. Atmospheric precipitation causes the K_u-band to attenuate, especially during heavy rainstorms. The weather affects K_u-band more than C-band. K_u-band carriers can operate successfully under bad conditions by increasing the gain of the system. For example, they can use a larger aperture antenna or increase the signal power.

Despite these obstacles, the developer chose satellite communications as a medium over more conventional land-line systems. Teleport considered three factors: economy, high fidelity signal reproduction, and broad multipoint nationwide coverage.

4. John F. Naughton, "Designing Urban Telecom Networks: 'The Teleport,'" Telecommunications, September 1983, p. 142.

The services to which a tenant subscribes will be allocated for a predefined time segment. On a dedicated basis, tenants will subscribe to one or more satellite systems for a given amount of bandwidth. Demand service will allow the tenant to request access to a specific satellite during a specific time period using a given bandwidth. A Telecenter or comparable telecommunications facility will be constructed at the Teleport site to interconnect the satellite earth station facilities with the fiber trunks (intra-region fiber-optic network) going into the city and elsewhere. This facility will function as the primary control station for handling all communications traffic flowing through the Teleport.[5]

The Intra-Region Fiber-Optic Network

The plan calls for the network to be managed by Western Union and to interconnect the World Trade Center in Manhattan, Journal Square in Jersey City, the office park in Staten Island, and the various earth stations at the Teleport. The Teleport was to provide circuits from 56 Kbps to multiples of T1, plus digital video circuits at 45 and 90 Mbps. (See Figure 1).

The first four-mile leg of the system, which employs a 48-fiber trunk, already has been installed by Western Union between the World Trade Center and the Port Authority Headquarters Building in Journal Square, Jersey City. The trunk runs through the Port Authority Trans Hudson (PATH) tubes beneath the Hudson River. The second link will connect the Journal Square location with the Staten Island site via the Bayonne Bridge (under the authority of the Port Authority of New York and New Jersey).

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5. Ibid.

Cable trunks will be available to the user either as point-to-point circuits between any of the Teleport nodes or on a switched basis through the local network. At each of the services points or nodes, the customer's access line(s) will be connected to the required multiplexing equipment for transmission over the fiber-optic network.

Each node will have the ability to monitor the resources associated with it (such as multiplexers, power, and lines). The nodes will be able to operate in an unmanned environment, except for the Telecenter node, which will have an operator interface allowing for complete surpervision of the system's facilities.[6]

The intra-region network will provide local distribution. Teleport planners are considering connections to Newark and Princeton, with Queens and Brooklyn already committed under an agreement with the City of New York.

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6. Ibid., p. 140.

4. The Participants

Several combinations of players can form a teleport. The New York Teleport and its participants represent one model; the Columbus, Ohio, Teleport represents another. The Columbus Teleport Corporation was formally organized on October 1, 1982, to serve the Ohio business community through a teleport facility. The principals involved are Compuserve, Inc.; Ohio State University; the Ruscilli Realty Corp.; and the Chemical Abstracts Service Division of the American Chemical Society.

From its incorporation, the group set two objectives: first, to establish the teleport as a business enterprise for moving data at profit, by establishing a system whereby teleport computers could effectively communicate with other computers throughout the U.S.; and second, to enhance the Columbus community and attract other high-tech enterprises there by setting new standards of telecommunications efficiency and technology. The principals merged their own needs and resources, as well as community considerations, to plan the teleport.[1]

The corporation performed a series of preliminary tasks to determine teleport viability in Columbus and community educational needs for concept acceptance. According to George M. Minot, senior vice president of CompuServe, the tasks -- which comprise a blueprint for teleport development -- concurrently targeted concept recognition and financial considerations.[2] To expand public perception of the teleport, the corporation targeted an educational campaign to community and state leaders, including members of Ohio Governor James Rhodes' staff.

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1. "The Columbus, Ohio Teleport," Real Estate Telecommunications News, Vol. 1, No. 1, March 1983, pp. 9-10.

2. Ibid., p. 10.

Promotional emphasis included 1) the strong connection between local, regional and state development activities; 2) the promise of high-tech jobs and job training and retraining programs; and 3) the need to upgrade what Minot referred to as the "antiquated" information-processing equipment currently used by state agencies and other institutions in the state capital. The result of such a "public and private cooperative" promotional effort, Minot said, was to focus community attention on the teleport as a vehicle to "unlock Ohio" telecommunications.[3]

Other projects nationwide may need this type of governmental and private industry cooperation. Potential teleport participants representing the private and public sectors include:

Private Sector

- Inter-City Carriers/Resellers
- Real Estate Developers/Brokers
- Local Telecommunication Carriers (BOCs, Independents)
- Companies with Communications Needs
- Equipment Vendors
- Database Suppliers
- Technical Service Suppliers
- Satellite Vendors
- Cable Television Providers

Public Sector

- Urban Development Agencies (Local, State, Federal)
- Municipalities/States
- Other Government Agencies

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3. Ibid., p. 11.

The teleport as a potential market concept may appeal to any of the participants listed above. Within the private sector, teleports are expected to provide interexchange carriers with increased opportunities for intercity, specialized and resale common carriage, as well as providing joint venture options both locally and nationally. In addition, teleports may offer the restructured Bell Operating Companies as participants the opportunity to expand their business activities, increase local access revenues, and lessen threats of local network bypass.

Cable television operators and satellite vendors also should benefit from the emerging teleport technologies. Local cable companies can provide bypass services to the teleport including broadband local computer networking for business, national cable operators may be able to provide regional interconnect services, and teleports could play a key role in cable franchising. For satellite vendors, teleports could provide opportunities for multiple-user, uplink earth stations; teleport networking; and shared teleport-teleconferencing capabilities.

With the development of teleports, office equipment and service suppliers may enhance their marketing of shared-user PBXs, local-area networking equipment, electronic mailbox systems, multiple-client word processing and data processing configurations. The small but growing industry of database service suppliers may market databases and data processing capabilities to the teleport for use by their customers. Technical services suppliers may offer teleports turnkey technical support, customer software, satellite earth station operations and maintenance, and preparation of proposals for teleport presentations.[4]

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4. Teleports: Facilities Management and Local Bypass for Telecommunications Users, The Gartner Group, Inc., June 30, 1983, p. 15.

The extensive public-sector involvement in the Columbus Teleport reflects the needs of a state affected by the recession to position itself technologically for economic development. The teleport represented an attractive way for Columbus to develop its real estate and telecommunications infrastructure. From the teleport's inception, active public-sector involvement in the teleport could insure that the final product will increase the marketability of the region.

The public sector also had an understandable interest in the development of a product with revenue-generating potential through licensing and operating fees in addition to rental income. Their participation in the design and implementation of the project will help guarantee that they benefit through increased revenues.

It may be in the best interest of the private sector to involve the public sector in the development of a product which may be subject to legal and regulatory problems (See Section 7). The profitability of a teleport hinges upon these unresolved issues and may be enhanced by the involvement of government authorities from the outset of the project. Public-sector participation in the teleport project's design and public-sector stakes in the project's revenues may be the most effective ways to reduce the likelihood of future regulatory difficulties.

5. Other Service Possibilities

The addition of telecommunications to existing real estate property and to future real estate developments has catalyzed developer activity. With the 1984 vacancy rates of office buildings at a national average of approximately 15% according to the Building Owners and Management Association, the combination of new tenant facilities with the rental space has initiated a new revenue stream for the developer and owners. Real estate entrepreneurs see a competitive advantage in the possibility of offering data and voice services on a shared-tenant basis. Associated high costs of such communications services on an individual basis have constrained the expense budgets of many potential tenants.

Communications is playing a major role in the daily activities of many business concerns. With communications costs as a significant portion of total operating expenses, telecommunications managers and business decision makers are investigating lower cost alternatives. The shared services concept is a possible alternative. Real estate developers with their communications services partners must offer needed services at economically acceptable prices. Service offerings will vary to meet market acceptability and tenant needs. To date, the developer still views as speculative the products and services considered for certain tenant applications. The risk involved with real estate development alone is high. When it is combined with a telecommunications investment, which is an unexplored area for real estate developers, the risk increases. To spread the risk potential, developers have sought venture partners.

Proposed and planned projects and those under construction are considering projected tenant needs of today and of the future. Table 2 lists products and services expected to serve the needs of those potential tenants. The offerings are of a "building block" nature. The partitionable digital PBX (private branch exchange) will be the backbone of the data- and voice-intensive communications body.

Table 2. Projected Teleport Products and Services.

Product/Service	Definition
Digital PBX	- integrated system with shared voice and data-switching capabilities.
Message Center	- service provided by PBX on a shared basis.
Electronic Mail	- computer-based shared service stores and forwards digital correspondence between users.
Voice Mail	- computer-based service allows analog voice signals to be stored in digital form and to be accessed by the user.
Facsimile	- shared high-speed transmission of graphic and textual correspondence through shared telephone circuits.
Word Processing	- central facility provides tenants with word processing services offered on a varied-usage basis.
Local Area Networks	- shared use of wideband communications network to provide multiple communications services over a common transmission medium.
Teleconferencing	- digital transmission service to provide full motion, full duplex video conferencing.
Satellite Earth Stations	- service to be offered on a dedicated or shared basis. Each dish can transmit and receive signals simultaneously from one or more satellites.
Optical Fiber Network	- local facilities for voice and data transmission and interexchange access.
Communications Center	- housing for the central nervous system of communications facilities. To contain mainframe computer, PBX, optical fiber rack, satellite hardware and electronics, and headend for local area network.

The three components which distinguish a teleport from a telecommunications-enhanced real estate project are: satellite earth stations, optical fiber network, and the communications center. The New York Teleport will offer these components and others previously listed. They will not necessarily be offered by the more than 40 other telecommunications-enhanced real estate projects planned throughout the country (see Appendix). Projects which never reach this type of technical sophistication can not be considered teleports (in the sense of the New York Teleport) but remain only telecommunications-enhanced real estate projects as defined in this study (see page 1).

6. The Communications Users

The voice and data products and services to be offered by telecommunications-enhanced real estate are many and varied, as Table 2 indicates. These products and services, in one or more of the three categories discussed below, provide current means for developers to meet the needs of potential users.

On-Premise Tenant Services Category

With reasonable rent, users may find the establishment of presence at the teleport economical compared to the investment of capital to duplicate the services which may be available on a shared basis. The user may want to move a "back-office" operation to the teleport to take advantage of the shared services availability. Developers offer a turnkey operation for facilities which include voice and data processing (see Section 5 for listing). In addition, the on-premise location can communicate with the local fiber-optic network and with the satellite facilities.

Interconnect to Local Fiber Optic Network Category

Users who only interconnect to bypass the local distribution network may communicate on a local level. The availability of an in-place local network may also open opportunities for a myriad of other types of local distributors. The capital expenditure for design and implementation of such a local network is part of the developer's investment.

Interconnect to Satellite Facilities Category

Users need not be on the teleport site. They may be able to take advantage of the developer's investment in both the fiber optic network and the satellite earth stations. Users may use the local network to reach the satellite earth stations for long-haul transmission. The teleport will provide opportunities for multiple user, uplink transmission, future teleport networking and shared teleport teleconferencing capabilities.

Table 3 describes a number of potential users and the possible categories which would be advantageous to their operations. It is assumed that the teleport offers the necessary services in each category. As the checklist indicates, a particular user may fit into one or more of the categories just described.

Table 3. Checklist: Users and Product/Service Categories.

USER	CATEGORY: ON-PREMISE TENANT SERVICES	CATEGORY: INTERCONNECT LOCAL NETWORK SERVICES	CATEGORY: INTERCONNECT SATELLITE FACILITIES SERVICES
Banks/Brokers	X	X	X
Credit Card Companies	X	X	X
T.V./Radio Broadcasters			X
Cable Companies		X	X
Life Insurance Companies	X	X	X
Engineering Firms	X	X	X
Oil Companies	X	X	X
Law Firms	X	X	X
Government Agencies	X	X	X
Print Media	X	X	X
Intercity Carriers/Resellers		X	X
Satellite Commun. Companies		X	X

7. Teleport Regulation

There have been no statutes, case laws, or regulations directed to teleport development; thus it is difficult to predict the legal issues and their resolutions. However, by examining the legal treatment of similar developments in telecommunications technology, one may identify some potential legal and regulatory issues at stake.

Regulation at the municipal level often requires a franchise (a license or consent) for the use of public streets or rights of way. This is a serious concern to teleport developers. Governments may regard teleports as mechanisms for generating local revenues. Municipalities may treat teleports as they treated cable television, which was to impose franchise fees upon cable systems.[1] These fees may be a percentage of gross revenues. This issue of franchise fees on cable television has been debated heatedly in the City of New York in regard to the development of the New York Teleport. In May 1983, the Teleport Communications Center, under an agreement reached with the city, would not have to pay a franchise fee provided it did not offer entertainment services to commercial establishments. But six cable companies negotiating to cable New York City and its boroughs found the accord unacceptable and planned to postpone their long-awaited services unless changes were made. City officials questioned whether the Teleport should pay a franchise fee for its construction of underground cables.

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1. Teleports: Facilities Management and Local Bypass for Telecommunications Users, The Gartner Group, Inc., June 30, 1983, p. 18.

According to Frederick A. O. Schwarz, Jr., the city's Corporation Counsel, Teleport was entitled to construct these cables without a fee because of a 135-year-old statute exempting Western Union from such charges. He said, however, that under the terms of the city's agreement and in deference to objections raised by cable companies, the Teleport would be barred from providing services to residences.[2] A number of city officials argued that the 1848 state law should not apply to the joint venture of Western Union and Merrill Lynch. The cable television operators had charged that such an exemption would have been "patently unfair" since they had been charged a fee of five percent of gross revenues for similar cable construction. "Why should we pay the five percent and they're not?" asked Richard Aurelio, Senior Vice-President of Warner Amex, when informed of the city's agreement. He said the only acceptable solution was to exempt the cable companies from the fee as well or bar Teleport from all cable construction and services.[3]

The argument over the franchise fee ended as city officials and cable company officials reached a compromise on June 22, 1983. The compromise worked out between the Board of Estimate and the cable companies' officials would give the companies "reciprocity" regarding Teleport. In fields where they might compete, they would be guaranteed equal treatment.[4] Final details were argued, notably the cable companies' contention that the five percent franchise fee to be paid to the city should be counted against their property tax bills.

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2. "SI Teleport Granted Fee Exemption," The New York Times, May 1, 1983, p. B-3.

3. Ibid.

4. Maurice Carrol, "Two Cable TV Companies Reach Tentative Accord with City," The New York Times, June 22, 1983, p. 31.

In another local regulation case, the State of New York through its New York Public Service Commission (NYPSC) has ordered Manhattan Cable Television, Inc. (MCTI) to file a petition for a "certificate of public convenience and necessity to operate as a telephone corporation pursuant to the provision of the Public Service Law." This subjects MCTI's point-to-point data transmission services to regulation and necessitates filing of tariffs.[5]

MCTI is contesting the requirement, claiming that the commission's jurisdiction only covers dominant carriers such as AT&T, that a 1981 New York act deregulating telegraphic services relieves the commission of any authority over MCTI's data transmission services, and that the state's Commission on Cable Television is the proper authority for MCTI. The NYPSC will allow MCTI to continue to offer its services pending the decision from the Commission's generic hearing on the subject of bypass and regulatory alternatives.

The Commission argues:

1.) The NYPSC's charter permits it to regulate any company providing telephone services.

2.) Deregulation of telegraphic services in 1981 specifically defines such services as Telex, TWX, facsimile, electronic mail, funds transfer, or other hard-copy data transmission.

3.) The NYPSC acknowledges that the Cable Television Commission is the proper regulatory for MCTI's broadcast television programming, but that the NYPSC itself has jurisdiction over point-to-point basic data or voice transmission services.

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5. New York State Public Service Commission Case 27091, "Proceeding on Motion of the Commission as to Private Line Service Provided by Manhattan Cable T.V.," instituted November 5, 1976.

4.) The NYPSC states that whether MCTI's services are "telegraphic" or not is irrelevant, as MCTI is providing bandwidth which could be used for voice as well as data transmission.

If the Commission's position is upheld, any data transmission service in the state could fall under the regulation of the NYPSC. While the Federal Communications Commission may have the authority to grant licenses for Digital Termination Service (DTS) offerings, to the extent that DTS operators provide point-to-point transmission services within New York, the NYPSC intends to regulate them as telephone common carriers. This applies as well to local distribution services provided by long-distance carriers. Because the teleport operators will be running high-speed local links to a number of points in Manhattan and elsewhere, the NYPSC is having discussions with the New York Teleport to ensure that the proper petitions are filed.[6]

Federal antitrust laws are another concern for operators and developers. Perhaps the most significant antitrust doctrine in this area is the prohibition on a monopolist's refusal to deal. Where one company owns an "essential facility" -- i.e., the only bridge between two cities -- it generally must make that facility available to any financially qualified user.[7] In the teleport example, the developer may be viewed as the monopolist of the real property, especially if the developer's property were unique in any way within the community. If a developer were considered a monopolist, it might need to lease space for teleport

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6. Ibid.

7. Michael Botein, "Thoughts About Legal Issues in the Operation of Teleports," Real Estate Telecommunications News, Vol. I, No. 1, March, 1983, p. 16.

facilities to any potential teleport operator -- even one which proposed to compete directly with a developer's own teleport service.[8]

More traditional real estate issues may arise, such as drafting leases and other agreements between developers and operators. If a developer does not operate its own teleport -- which, as indicated above, may make sense for avoiding common carrier regulation -- the developer presumably must be compensated fairly by any teleport operator to which it authorizes and leases space.[9] There are also non-price considerations with which the developer must be concerned, such as insuring to provide adequate service to tenants. Because the law is still so new and uncertain, the developer must be concerned about future liabilities and responsibilities in the event of legal modifications. Again, the future arrangements between the developers as real estate entrepreneurs and the service operators resemble the current complex franchise agreements between municipalities and cable companies.

In summary, the legal status of teleports is not clear; nor will the immediate future present the answers to any teleport regulatory questions. Until precedence is set, teleport developers may be subject to a number of regulatory-related problems.

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8. Ibid.

9. Ibid.

8. Local Telecommunications Carriers' Concerns: The Bypass Issue

The potential bypass opportunities that the teleport offers are a major issue for the LTC. The ability to provide local service without the need for access to the facilities of the local telecommunications company is an important feature in teleport design. The amount of bypass threat to the LTC depends on the stage of the teleport development.

The teleport developers offer two types of bypass:

1) Local Bypass - A business can connect as a customer or tenant to the local distribution network (most likely a fiber optic system) provided by the teleport for service within the network. This bypasses local services provided by the LTC.

2) Long-Haul Access Bypass - The customer or tenant can link to long distance carriers by way of the teleport access facilities. The bypass avoids the access which can be provided by the LTC.

These types of bypass affect not only the LTC but also other stakeholders; many are concerned with the outcomes if the teleport is a successful bypass vehicle. To shed light on the general issues for stakeholders, Table 4 depicts the type of bypass, the stakeholders involved and some evident stakes to be considered. The sources are interviews with and articles by the parties involved.

Table 4. Bypass Stakeholders and Their Stakes.

Bypass Type	Stakeholders	Stakes
1) Local Bypass	LTC	1) Potential loss of revenue 2) Loss of high-volume users 3) Loss of market share
	Teleport Operator	1) Large capital investment 2) Possible high rate of return
	Teleport Customer/Tenant	1) Lower rates for services 2) Need for reliability and dependability
	Non-Teleport Customer	1) Potential rate increases 2) Potential loss of quality and degree of service
	Regulators (Local Level)	1) Control bypassers 2) Subsidize LTC 3) Change pricing policies 4) Threat of bypass
2) Long-Haul Access Bypass	LTC	1) Loss of revenue from long distance carriers
	Long-Distance Carrier	1) Potential lower rates for teleport users
	Teleport Operator	1) Potential revenue from package deals with long distance carriers for lower charges to tenants
	Teleport Customer/Tenant	1) Potential lower rates 2) Potential number of greater services and offerings
	Non-Teleport Customer	1) No advantage of shared offerings 2) Potential higher rates including LTC access fee
	Regulators (Local and Federal)	1) Higher local rates 2) Lower long-distance rates 3) Threat of bypass

After reviewing the issue of bypass and the stakes for the stakeholders, the LTC, with ample resources of its own, may plan to meet the threat of bypass.

The concept of economic and uneconomic bypass is currently subject to regulatory debate, and there has not been general agreement on the underlying concept of "true" costs. Those who use the term consider economic bypass to occur when the service provided by the competing technology is less expensive than the price at which the BOC (LTC) can offer its service. Uneconomic bypass is said to occur if the rate or rate structure of either the BOC (LTC) or the competitor do not reflect "true" costs.[1] But skepticism about the concept of "true" costs renders problematic the economic/uneconomic bypass distinction. Regardless, the LTCs have other resources to meet the competitive challenge.

The prospect that teleport and other competitors will siphon customers away from LTCs has already prompted regulators in California and elsewhere to take a new look at their states' telecommunications policies. The rapid changes in technology and in the economics of the telephone industry are eroding the LTC's monopoly of local communications. Many telecommunications stakeholders fear that if the erosion remains unchecked, it could eventually drain so much high-profit business from the LTCs that they will be unable to fulfill their original mission of offering affordable basic local telephone service. In its order in Docket No. 78-72, the FCC has moved toward avoiding uneconomic bypass. As Commissioner James Quello

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1. "The Bypass Threat -- and What to do About It," Telephony, July 18, 1983, p. 121.

commented: "Bypass, while not widely understood and appreciated, provides perhaps a greater threat to universal service that do increased local rates of a magnitude far above those implied by our action today."[2]

Debate over bypass in the houses of legislation continues at the federal level and may be crucial to teleport development at the local level. The questions of bypass, erosion of customer base, pricing policies and others will affect the stakeholders. What happens is important to builders and investors of teleports and to their potential customers.

Teleport as an emerging business opportunity will inevitably pose a threat to the LTC. Local, state, and federal regulation will determine the significance of this threat.

"The question is not whether the BOC (LTC) will lose market share," according to the New York investment firm of Sanford C. Berstein & Co. Inc. in a recent analysis of AT&T's local telephone monopolies, ". . . but how much and how fast . . . . a critical determinant of [their] success will be the terms under which they are allowed to compete."[3]

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2. Ibid.

3. "Teleports May be the Newest Threat to Bell Companies' Local Dominance," 1983 National Journal, November 12, 1983, Vol. 15, No. 46, p. 2348.

9. Major Points

The feasibility of the teleport hinges upon several considerations, including:

1. The real estate and telecommunications components that make up the teleport;
2. The private and public sector players involved in the planning, design, and implementation of the teleport;
3. The technical and financial limitations of local loop distribution;
4. The regulatory and legal issues surrounding teleport development;
5. The capitalization requirements of the players.

Will a teleport by viable? It is too early to determine any degree of success. However, many players are investing capital dollars to advance the concept to a reality.

Currently, regulatory and legal issues may preclude the involvement of the LTC in an equity position partnership. However, as an agent or operator the LTC could meet the threat of bypass while maintaining its active participation in the teleport and positioning itself for a more active role as legal obstacles are reduced.

As a new concept, the teleport will attract speculators who will try, with varying degrees of success, to identify and meet the needs of the emerging market.

APPENDIX

Telecommunication-Enhanced
Real Estate Projects

Name	Location	Developer	Size (Sq.Ft.)
Midvale Park Commerce Center	Tucson, AZ	Estes Company	10 Acres
Chancery National Bank Bldg.	Denver, CO	C & O Limited	239,000
Lawyer Professional Center	Denver, CO	Naiman Company	73,000
Linpro Center One	Denver, CO	Linpro	99,500
Republic Plaza	Denver, CO	Oxford-Anschultz	1,200,000
Tabor Center	Denver, CO	Williams Realty	1,300,000
Writer Five Bldg.	Denver, CO	Writer Schruggs Realty	165,000
City Place	Hartford, CT	Urban Investment & Development; Bronson & Hutzinsky	900,000
Connecticut Plaza	Hartford, CT	Richard Gordon	560,000
National Food Processors Bldg.	Washington, D.C.	John Akridge	198,000
National Press Bldg.	Washington, D.C.	Turner Construction	300,000
Agriplex	Orlando, FL	Agriplex Corp.	7,000,000
Merchandise Mart	Chicago, IL	Merchandise Mart, Inc.	
One Financial Place	Chicago, IL	U.S. Equity Realty	1,100,000
One Park Place	Chicago, IL	Collins Tuttle & Co.	600,000
One South Wacker	Chicago, IL	Harvey Walken Metropolitan Structures	1,200,000
333 W. Wacker	Chicago, IL	Urban Investment and Development	790,000

APPENDIX (continued)

Energy Center	New Orleans, LA	Lincoln Properties	750,000
BOSCOM	Boston, MA	FMR Properties/ Fidelity Group	600,000
Boston Teleport	Boston, MA		1,500,000
100 South Fifth	Minneapolis, MN	OPUS Developers, Inc.	414,000
Harmon Meadows	Secaucas, NJ	Hartz Mountain Industries	265,000
Princetonpark	Princeton, NJ	Seltzer Organization	9,000,000
New York Teleport	New York, NY	Merrill Lynch, Western Union	1,000,000
World Financial Center	New York, NY	Olympia & York	1,540,000
375 Hudson	New York, NY	Tishman Speyer	900,000
Columbus Teleport	Columbus, OH	Ruscilli Realty	
Bank of Dallas	Dallas, TX	Hines Industrial	120,000
Colonade	Dallas, TX	MEPC American Properties	350,000
Dallas Galleria	Dallas, TX	Gerald D. Hines Interests	467,512
Diamond Shamrock Bldg.	Dallas, TX	Trammell Crow	827,704
Houston Teleport	Houston, TX	Urban Wealth Ventures	134 Acres
Info Mart/Dallas Market Center	Dallas, TX	Trammell Crow	1,500,000
Las Colinas	Irving, TX	Southland Real Estate Resources	12,000,000
Lincoln Plaza	Dallas, TX	Lincoln Properties	1,200,000
LTV Center	Dallas, TX	Trammell Crow	1,300,000
San Jacinto	Dallas, TX	Trammell Crow	844,000
Texas Plaza	Dallas, TX	Tecom Realty Corp. & MEPC Properties	300,000

APPENDIX (continued)

Toller Building	Dallas, TX		
Union Bank & Trust	Dallas, TX	Lincoln Properties	205,000
United Bank	Houston, TX	Wortham & Van Liew	
2001 Bryant Towers	Dallas, TX	Trammell Crow	1,064,210
3811 Turtle Creek	Dallas, TX	Lincoln Properties	312,500
Crystal Gateway 2	Arlington, VA	Charles E. Smith	256,000
Crystal Gateway 3	Arlington, VA	Charles E. Smith	315,000
Five Skyline Place	Arlington, VA	Charles E. Smith	289,000
PRC Building	McLean, VA	Tyson-McLean	461,000
Columbia Center	Seattle, WA	Martin Selig Realty	1,500,000