An Assessment of Telework in the New York Metropolitan Area

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Prepared by

Elham Shirazi, E-planning
Kim Brant, Integrity Business Consulting
Steve Gerritson, Pacific Rim Enterprise Center
Ann Dempsey, Pacific Rim Enterprise Center
Lori Diggins, LDA Consulting

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U.S. Department of Transportation
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Executive Summary

Introduction

This study was requested by the Conference Report accompanying the Department of Transportation and Related Agencies Appropriations bill for the fiscal year 2001, H.R. 4475, (House Report 106-940), which calls for "an assessment of the existing policies and infrastructure involved with telework efforts in the greater New York metropolitan area" in order to "determine if a telework program, supported by the Federal Government, could provide significant incentives for increasing the use of telework, thereby reducing vehicle miles traveled and improving air quality." (See Appendix)

For the purposes of this study, the New York metropolitan region comprises the New York, northern New Jersey, and Connecticut severe ozone non-attainment areas.

For this study, research was conducted on prior and existing telework programs. A list of agencies, stakeholders, and organizations that have proposed or implemented telework programs in New York was developed and interviews were conducted with those organizations. A greater New York telework steering committee was then convened with representation from the three states to develop recommendations for the greater adoption of telework in the region.

This study presents:

- a review of the barriers facing increased implementation of teleworking,
- the latest data on telework nationwide and in the greater New York region,
- an overview of adopted and proposed legislation,
- a review of teleworking, State Implementation Plans, and transportation conformity,
- summaries of demonstration programs and case studies, and
- steering committee policy recommendations for further implementation of teleworking in the region.

Background

Telework has grown considerably in the past decade. In 1990, there were approximately 3.4 million teleworkers in the United States. By 2000, there were approximately 23.6 million.

Based on data compiled from the Regional Travel-Household Interview Survey (RT-HIS) 1997-98, in the New York Metro area, approximately 11.9 percent of workers telework (home-based businesses and those who are employed and work at home) at least one day per week. The highest telecommuting rate is in Connecticut, where 15.4 percent of workers telework, and the lowest rate is in New York, where 10.5 percent of workers telework. Approximately 14 percent of New Jersey workers telework. It should be noted, however, that this data, which is based on the Regional Travel-Household Interview

Survey (RT-HIS), includes individuals with home-based businesses. From the RT-HIS study, it was not possible to deduct the quantity or proportion of home-based businesses from those who work at home.

Barriers to Telework

Barriers to telework have existed since its inception. Management issues have always posed the greatest barrier for the implementation of telework, and this includes concerns with productivity, loss of control over workers, and a loss of company spirit or lessened corporate loyalty on the part of teleworkers. There are also legal and policy issues which impact telework. These include zoning laws, OSHA regulations, and taxation concerns. Finally, cost and availability of technology and connectivity has been an issue, but one which has been largely mitigated in recent years due to advancing technology.

Telework Legislation

The adoption of telework nationally is being enhanced through a variety of existing and proposed legislative bills. At the Federal level, the Congestion Mitigation and Air Quality Improvement Program (CMAQ) provides funds for transportation projects or programs that contribute to attainment or maintenance of the national ambient air quality standards for ozone and carbon monoxide. Additionally, P.L. 106-69, Section 365, and P.L. 106-24, Section 2603, address telework by proposing emissions credits for reducing air pollutants. In addition, S. 521 and H.R. 1012, both entitled the "Telework Tax Incentive Act," proposed tax credits for expenses incurred in teleworking. S. 522 and H R. 1035, entitled the "Small Business Teleworking Act," called for a pilot program to raise awareness about teleworking among small business employers, to encourage such employers to offer teleworking options to employees. The Telework Tax Incentive Bills nor the Small Business Teleworking Bills have been enacted into law.

Legislation is being proposed at the local level as well. Most recently, in New York, Assemblymen Kevin Cahill, of Kingston County, NY, and Felix Ortiz, of King's County, NY, introduced A.B. 953, the "Telework 2001 Act," which calls for the creation of a task force and demonstration program on teleworking to study the impacts and benefits of telework. Assembly Bill 2648, in New Jersey, grants tax credits to corporations with teleworking employees. In Connecticut, the Department of Transportation already has regulations related to a Voluntary Traffic Reduction Program in place. The Connecticut DOT also offers tax incentives for those companies in Connecticut's non-attainment area, which have more than 100 employees and which encourage employees to use alternate means of travel to work.

Teleworking, State Implementation Planning, and Transportation Conformity

A review of the State Implementation Plans (SIPs) and transportation air pollution conformity analyses for New York, New Jersey, and Connecticut, revealed that "no assumptions" were made concerning the level of teleworking and no air pollution credit was taken for teleworking programs.

Telework Service Providers

Within the New York Metro Region, a variety of telework service providers assist corporations with the establishment of telework programs and, in some instances, also gather and maintain metrics related to telework. These organizations offer varying levels of expertise ranging from merely offering literature to actually helping employers with program design. Within the non-attainment areas reviewed for this study, some of these service providers include CommuterLink, Long Island Transportation Management, Westchester County Department of Transportation-Smart Commute, TransOptions, Greater Mercer TMA, and Telecommute Connecticut!.

Existing Telework Programs in the Region

Corporations with telework programs identified in this study include American Express Travel Related Services, AT&T, IBM, Deloitte & Touche, the New York Times, Deutsche Bank, Merrill Lynch, PricewaterhouseCoopers, Vytra Health Plans, Nabisco, Dunn & Bradstreet, Verizon, Johnson & Johnson, Telcordia Technologies, Avaya, Schering-Plough, Georgia Pacific Company, and Pitney Bowes. Case studies were summarized on these programs and are included in Appendix 4 of the report.

Steering Committee

A steering committee was established to provide a forum for discussion and development of policies to accelerate the adoption of teleworking in the greater New York region. As stated by the Conference Report accompanying H.R. 4475, representatives from local government, environmental organizations, and transportation agencies were selected to serve on a greater New York steering committee. Additionally, air and transportation agencies, transportation management organizations, rideshare organizations, metropolitan planning organizations, educational institutions, and private sector organizations were contacted and interviewed for serving on this committee.

Once the steering committee was formed, three formal meetings were conducted with the members. The main objectives of the meetings were to identify barriers to and enablers of teleworking, and to develop potential policies that could help accelerate the adoption of teleworking.

The steering committee defined telework as:

- Extending the workplace beyond the traditional office.
- Typically a voluntary arrangement and not an entitlement.
- Replacing a commute trip.
- Part-time (1-3 days per week) or full time (4-5 days per week).
- Not applying to home based businesses or sales oriented occupations.

Barriers, Mitigations, and Recommendations

The steering committee initially identified more than twenty barriers to telework, which were grouped and prioritized into three main categories of barriers, including:

- Buy-in / Management Leadership,
- Guidelines / Available Data, and
- Government Leadership.

Buy-In / Management Leadership. When reviewing barriers, the lack of buy-in and management leadership rose to the top of the list. Management commitment is critical for starting and expanding programs. Typically, buy-in needs to occur at both the mid and upper levels of management before a program becomes successful. This lack of buy-in is often tied to lack of knowledge on teleworking effectiveness as well as of the components of program implementation, which was the second barrier identified by the group.

Guidelines / Available Data. While there is a wealth of information on teleworking created in the past 20 years that can help support bottom-line benefits of telework programs, perception remains that there is a lack of guidelines and available data, primarily because there is a lack of consistent and centralized data. There are solid implementation steps, such as developing policies and selection criteria and offering training that can help overcome many of management's fears regarding programs.

Government Leadership. The steering committee participants identified lack of government leadership in offering incentives or starting their own internal programs as a barrier to greater adoption of teleworking.

Recommendations

Based on meetings with the greater New York telework steering committee, and review of the findings of this study, several actions need to be undertaken to increase the adoption of telework in the region. The recommendations are as follows:

A Model Program. A Model Program would serve as a one-stop resource for information, materials, expert advice, and hands-on assistance for developing/expanding telework programs tailored specifically to a company and its employees. The main incentive provided through such a program would be access to free assistance for program development and implementation. The steering committee strongly felt that this type of a program would help accelerate the adoption of teleworking in the region.

Such a program can offer a comprehensive package of technical assistance services, including:

- One-on-one consultation with telework experts,

- Identification and selection of telework candidates,
- Development of telework policies, procedures, and agreements,
- Marketing of telework to upper and middle management,
- Provision of sample materials, case studies, and implementation kits,
- Program evaluation guidelines and strategies,
- Training sessions for managers and teleworkers,
- Website with all necessary tools for implementing teleworking, and
- Assistance with exploring teleworking as a strategy for conformity or the SIP.

As part of developing this model program, it is recommended that government agencies lead by example.

Public Awareness. In conjunction with development of a Model Program that provides tools and resources for program implementation, a public awareness campaign would need to be developed to educate decision-makers on the benefits of teleworking. These benefits would be positioned from a bottom-line perspective, emphasizing the work/life aspects of teleworking. Components of such a campaign could include:

- Publicizing case studies/success stories on teleworking,
- Placing news articles and TV spots,
- Promoting teleworking through political champions,
- Collecting improved information on teleworking in the region,
- Providing cost-benefit information on teleworking to employers,
- Conducting press events on teleworking, and
- Working with the vendor and telecommunications community to develop discount programs for teleworkers.

A public awareness campaign with good data and examples on teleworking could help pave the way for increased interest in teleworking. A Model Program could then provide one-on-one assistance and tools for transforming that "interest" into actual implementation.

Dedicated Sources of Funding. It is recommended that a dedicated source of funding support a Model Program and the public awareness campaign. The steering committee felt that otherwise, "other than in Connecticut, teleworking would never make the list of state and regional programs."

Market-Based and Tax Incentives. The steering committee discussed the potential for market-based and tax incentives and concluded that although such incentive programs could help accelerate the adoption of teleworking in the region, their implementation was premature. It seemed, however, that creation of an infrastructure related to the promotion and one-on-one assistance for implementation of programs was a precursor to implementing this tier of policies. Tax incentives and emissions trading programs might be viable strategies in the future.

Chapter 1: Purpose of this Report

As requested by Conference Report accompanying the Department of Transportation and Related Agencies' Appropriations bill for the Fiscal Year 2001, H.R. 4475 (House Report 106-940), an assessment was conducted of teleworking in the greater New York region. This chapter provides information on the objectives of H.R. 4475, the methodology used to conduct this study, the scope of work, and the geographic boundaries identified for the project.

Objectives of Telework Bill

Conference Report (106-940), accompanying H.R. 4475, requested that the Department of Transportation undertake the following,

"Telework. The Secretary shall conduct as assessment of the existing practices and infrastructure involved with telework efforts in the greater New York metropolitan area and determine if a telework program, supported by the federal government, could provide significant incentives for increasing the use of telework, thereby reducing vehicle miles traveled and improving air quality. The assessment should identify representatives from local government, environmental organizations and transportation agencies who would comprise a New York City design team for implementing a telework program. . . "

In November 2000, the U.S. Congress enacted H.R. 4475 as Public Law 106-69 and approved funding for an assessment of the state of teleworking in the metropolitan New York region. The objectives of this assessment are to identify the existing programs, infrastructure, and stakeholders related to teleworking and to develop recommendations, with guidance from a local design committee on creating greater incentives and resources for teleworking in the New York region.

Geographic Scope

For the purposes of this study, the New York metropolitan region comprises the severe ozone non-attainment areas within New York, northern New Jersey, and Connecticut. The non-attainment areas within Connecticut are Fairfield County and part of Litchfield County. In New Jersey, non-attainment areas include Bergen County, Essex County, Hudson County, Hunterdon County, Middlesex County, Monmouth County, Morris County, Ocean County, Passaic County, Somerset County, Sussex County, and Union County. In New York, the non-attainment counties have been identified as Bronx County, Kings County, Nassau County, New York County, Queens County, Richmond County, Rockland County, Suffolk County, Westchester County, and parts of Orange County. (See Appendix 2)

Methodology

To complete an assessment of teleworking in the greater New York region, the following tasks were identified and completed.

1. Conduct Research on Prior and Existing Programs.

Research was conducted on the scope and parameters of telework programs in the New York region. This research included a review of existing case studies and programs including print media, the Internet, and discussions with other practitioners and academics. The research also identified regional goals established for teleworking in current air quality and conformity planning.

2. Identify and Interview Stakeholders.

A list of agencies, stakeholders, and organizations that have proposed or implemented telework programs in the New York region was developed. This list included transportation and environmental agencies, private and public sector employers, telecommunications providers and vendors, transportation management associations, Metropolitan Planning Organizations, business organizations, educational institutions, and others.

Interviews were conducted with key agencies and organizations. These interviews were conducted in person or by phone. The interviews assisted in developing a synopsis of New York-based programs. The main stakeholders were interviewed in person to develop a better understanding of the New York environment for teleworking.

3. Prepare and Present an Assessment of Teleworking in New York.

A report was developed based on the interviews and review of programs in the New York region. These findings are available in Chapters 2 through 7 of this report.

4. Convene a Design Team for Developing a New York Program.

A New York based design team was convened to review and refine the assessment and to provide recommendations for a telework program. This group helped provide tailored recommendations for increasing levels of teleworking in the greater New York region. The steering committee selection procedures and a list of members and participants appears in Appendix 5.

5. Develop Recommendations for the Greater Adoption of Teleworking.

Based on comments derived from the local steering committee meetings, recommendations were developed for incentives and programs that can accelerate the adoption of teleworking in the greater New York region. These recommendations are included in Chapter 9.

Chapter 2: Background

Overview on Teleworking

The term "teleworking" is broadly defined as moving the work to the workers. Teleworkers spend one to five days per week working at their homes or at an office locale closer to home, instead of at their employers' office. The "fundamental characteristic of teleworking is that it substitutes for a trip that would otherwise be made to a traditional worksite or reduces the distance the employee travels to work."[1] Teleworking does not apply to self-employed persons working at home. The terms teleworking and telecommuting are often used interchangeably.

There have been several trends that have resulted in the growth of telework. During the 1970s, the oil crisis sparked an initial interest in teleworking. Later, in the 1980s and 1990s, several public and private organizations experimented with pilot projects and publicized the results. During the early 1990s, as companies responded to the requirements of the Clean Air Act of 1990, there was greater interest in teleworking as a strategy for trip reduction. At this time, although technology advancements made teleworking more feasible, connectivity issues presented some limitations. These limitations included slow modem speeds and a lack of significant dial-up options other than analog phone lines. Finally, during the mid to late 1990s, as technology and connectivity improved, as unemployment rates declined significantly, and as the competition for recruiting and retaining employees grew, companies began to explore a variety of Alternative Work Arrangements (AWAs) as a means of attracting and retaining top talent. Among those arrangements were compressed or shortened workweeks and teleworking.

The growth in teleworking, according to the Telework America 2000 survey statistics, has exceeded many projections of the early 1990s. The graph below indicates the growth in teleworking in the United States from 1990, when there were approximately 3.4 million reported teleworkers, to 2000, with an estimated 23.6 million teleworkers.

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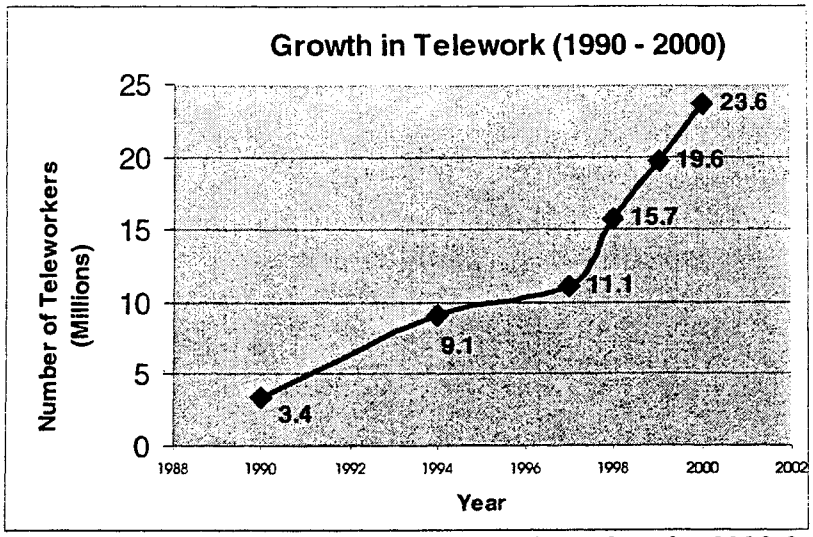
[1] New Jersey Commerce and Economic Growth Commission, New Jersey Department of Transportation, New Jersey Department of Treasury, 2001, "*Report to the Legislature On Issues Influencing Growth of Teleworking in New Jersey and Recommendations for Future Legislative and State Agency Actions*"



Data for 1990, 1994 and 1997 from Find/SVP, data for 1998 from Cyber Dialogue, and data for 1999 and 2000 from ITAC/AT&T.

Institutional and Marketplace Barriers to Teleworking

There are a variety of institutional barriers to teleworking, which include management and labor issues. Most teleworking proponents believe that management issues are the biggest obstacle to the widespread adoption of telework programs. Many employers are concerned that employees will not be as productive when they telework. Managers fear that they may lose control over employees if they do not see them all the time. The most frequently cited impediment to greater adoption of teleworking by public and private sector employers has been management resistance and lack of corporate buy-in. Many teleworking programs are never adopted because of the lack of management support.

Management Issues

Teleworking programs are dependant upon management's willingness to allow employees to participate in the program. This willingness is based on the managers' and supervisors' trust that the employees will complete their work without being supervised directly or watched. Many supervisors/managers feel that their employees need to be in the office to complete their work, i.e., that they cannot trust the employees to work on their own. Generally, management's objections are related to productivity, loss of control, and loss of corporate loyalty.

Productivity

Manager's may be doubtful that employees can produce an acceptable quality and quantity of work when working at home or at a teleworking work center, despite the fact that most teleworking pilot studies and programs indicate that productivity can increase as a result of teleworking. This reported productivity increase is a result of more continuous work time, fewer interruptions, and a more pleasant work environment. Typically, in other studies as well as this one, productivity is reported to increase 10-20 percent as a result of teleworking. At a minimum, studies have shown that productivity stays at the same level,

when employees telework or work at the office. Productivity is difficult to measure for jobs that are not quantifiable. As a rule, the criteria for evaluating work, which is performed at home or at a center, should be the same as the criteria used in evaluating the same work in the office.

Loss of Control

Often managers are worried that they may lose control over employees if the employees are not physically accessible. They fear that teleworking may lead to greater independence and decision-making authority among the staff. Often, management is not prepared to support greater levels of employee empowerment or autonomy. In addition, some managers may be concerned that teleworking could render their own jobs useless. In reality, teleworking does not have to lead to lessened control. Today, a variety of technological innovations, such as modems, facsimile machines, e-mail, videoconferencing, and wireless technologies, enable managers to more easily and effectively manage remote staff. Nonetheless, managers continue to fear loss of control without daily face-to-face contact.

Loss of Corporate Loyalty or Company Spirit

Managers are concerned that if employees are out of the office too often, they will lose their "company spirit" or "corporate loyalty." In addition, management is concerned with an inability to hold "spur-of-the-moment" meetings. Ironically, teleworkers claim that their productivity is increased because they are not interrupted by meetings and other interruptions that occur in the office. Nonetheless, given that most teleworking occurs on a part-time basis, there are plenty of occasions for teleworking employees to attend meetings and to keep their ties with the company. One or two days of teleworking per week rarely results in a lack of corporate loyalty.

Security Issues

Managers are also concerned about protecting proprietary and sensitive data. They are worried about the vulnerabilities of providing employees with remote access to the internal systems. Teleworking, however, is only appropriate for some employees. Typically, teleworkers are the "trusted" employees who have access to the same data internally and have proven themselves capable of handling sensitive information. There are also technological advances that can limit access to sensitive information while teleworking.

Legal and Policy Issues Impacting Telework

Zoning

Many zoning laws exist which forbid the operation of home businesses in certain residential zones. These zoning regulations pre-date telework, as well as broadband and high-speed technology and computing capabilities. The initial objective of many zoning laws was to clearly distinguish residential areas from commercial areas. Many concerns

that gave rise to zoning legislation were related to noise and traffic in residential neighborhoods.

OSHA

The Occupational Safety & Health Administration (OSHA) regulates workplace safety and health standards. For many years, there has been concern on the part of employers with teleworking employees regarding liability for injuries, which occur in the "workplace" when the workplace is the employee's home. While OSHA does not currently require home inspections, many employers either conduct home inspections of teleworking employees or provide guidelines for ergonomic and safety standards for setting up home offices.

Taxation

There are a variety of taxation issues related to telework, ranging from state income tax to local payroll tax to state unemployment insurance or state worker's compensation. All of these become issues when the work location becomes a question. Generally, a worker is considered an employee of the state where his or her employer is based. On the other hand, a tax agency of the teleworker's state of residence might consider the teleworker to be an employee of that state, subjecting him or her to state income tax.

Under such circumstances an individual could become liable to pay income tax in two states, if the individual lives in one state and works in another or works part time in one state and part time in another. In some cases, income tax paid to one state might be usable as a credit against income tax paid to another state. Some states base income tax laws on where the work is done, not where the company is located, while others base tax laws on where the company is located, regardless of where the work is actually performed. The challenge arises when the laws of two states differ enough as to be in potential conflict with each other. Another challenge is to clearly distinguish between a teleworker, who splits his or her time between the employer's office and his or her home office, and a "teleworker" who is, in fact, a virtual office employee working and living in one state and who never actually goes to work at the employer's home office located in another state.

A professor of law at Cardozo University, Ed Zelinsky, lives in Connecticut, works at home, and commutes to New York to teach. In a case before the New York State Division of Tax Appeals, an administrative law judge ruled that Zelinsky owes taxes on his income in both Connecticut and New York. Calling the doctrine "technologically obsolete in an era of teleworking," Professor Zelinsky is appealing the decision,[2] and will fight on the basis that under the Due Process and Commerce clauses of the Constitution, there should be apportionment based on where the taxpayer works. New York has a "source theory" of taxation, basing its claim to tax Zelinsky's income on the fact that it came from a New York employer. Connecticut bases its income taxation on where the

[2] http://www.cardozo.net/life/winter2001/faculty.briefs/ - Cardozo Life magazine

income is earned, i.e., where the person works, and gives a credit for income tax paid for work in another state.

The key to resolving the tax issue is for the individual taxpayer to consult with a tax specialist or to obtain the tax filing booklets for each state in question.

Technology Issues Impacting Telework

In the early 1990s, as teleworking was on the rise, companies continued to cite technology and connectivity restraints to teleworking. Today, with improved computing technologies and the reduced cost of obtaining laptop computers, equipping teleworkers' home offices is becoming more cost effective for employers. In addition, connectivity is becoming less of an issue as new broadband technologies are deployed. Teleworking technologies can be categorized as technology that supports day-to-day activities and technology that supports information access and connectivity.

Day-to-Day Teleworking Technology Needs

Day-to-day technologies which are essential to teleworking include phones, computers, software, and other peripherals. The technologies required for day-to-day completion of knowledge worker job tasks are relatively ubiquitous. Nonetheless, before embarking on any full-scale technology implementation to support teleworking, employers should define requirements for teleworking, as they would define requirements for any system implementation project. The requirements definition process should identify those technologies and functions that are essential for workers to perform their daily job tasks. After defining needs and requirements, the employer should conduct a cost-benefit analysis of the various technologies to select the most effective solution rather than the "latest and greatest" technology, which might not be practical or cost effective at all.

Technology for Connectivity

Technologies that go beyond the bare minimum but which are vital for information access and connectivity include remote access servers, digital PBX, virtual private networks (VPNs), wireless connectivity, teleconferencing, basic Internet/Web access, and high speed data lines such as ISDN, DSL, cable modem and, possibly, T1 lines. These technologies are discussed below.

The Internet can easily support the majority of teleworkers through e-mail, electronic file exchange, and connection to remote hosts. For an employee to work via the Internet, the employer must provide a connection to the remote host server. The host system must be connected to a network, which is attached to the Internet. Cost of remote access solutions varies, depending on size and number of features available. However, the Internet gives rise to security concerns, and if a company is relying on the Internet as the employee's means of remote access, the company must take appropriate security measures. These might prove to be costly. Several employers which previously relied on analog phone systems for connectivity with their teleworking employees are now piloting

ISDN, DSL, cable modem access, and the creation of virtual private networks (VPNs) to ensure greater levels of security. These technologies are discussed below.

DSL (Digital Subscriber Line) is a technology for bringing high-bandwidth information to homes or small businesses over ordinary copper telephone lines.

ISDN (Integrated Services Digital Network) is a set of standards for digital transmission over ordinary telephone copper wire as well as over other media. Home and business users who install an ISDN adapter in place of a modem are able to download graphic intensive web pages at speeds up to 128 kbps (kilobytes per second). ISDN requires adapters at both ends of the transmission, so the access provider also needs an ISDN adapter.

A cable modem is a device that enables an individual to hook up a PC to a local cable TV line and to receive data at about 1.5 Mbps (megabytes per second). This data rate exceeds that of traditional 28.8 or 56 K modems and also exceeds the 128 Kbps speed of ISDN lines.

T1 lines are commonly used digital lines, which carry code at an overall rate of 1.544 million bits per second. T1 lines use copper wire and span distances within and between major metropolitan areas.

A virtual private network (VPN) is a private data network that makes use of the public telecommunication infrastructure, maintaining privacy through the use of security procedures and a "tunneling protocol." The idea of a VPN is to give a company the same capabilities at much lower cost by using the shared public infrastructure instead of a private one that the company would have to build at considerable time and expense.

At present, deployment of DSL, ISDN, and cable modem is not as widespread as had been anticipated. Telecommunications providers have been scrutinized and criticized for their inability to rapidly deploy solutions such as DSL, ISDN, and cable modem. Although the technology exists today and is deployed in some urban centers, there are limitations; for example, some geographic regions are not wired yet for some or all of the relevant technologies. In addition, many of the telecommunications providers and cable companies do not yet have the infrastructure in place to deploy these technologies at a pace that meets marketplace demand. For teleworking to be more easily accomplished, it is important that these constraints be minimized over the next couple years.

Summary

This chapter has outlined the barriers to teleworking. Management resistance continues to be the greatest barrier to teleworking at this time. Employers that are commencing telework programs should be aware of zoning, OSHA, and taxation issues, but those should not prove to be a great obstacle to the implementation of telework programs. Advances in technology and connectivity can enhance the adoption of teleworking; in some areas connectivity and access continue to be an issue.

Chapter 3: Current Levels of Teleworking in the Metropolitan Region

National Teleworking Levels

According to a Year 2000 study completed by Telework America (TWA), approximately 16.5 million regularly employed teleworkers in the U.S. telework at least one day per month. While this represents a decline from the 19.6 million teleworkers counted in 1999, different measurement criteria were used in each year. In 1999, the sample included both regularly and occasionally employed workers while the year 2000 study focused more on regularly employed workers. If the 1999 criteria were applied to the Year 2000 study, the number of teleworkers in the U.S. for the year 2000 would be approximately 23.6 million, which represents a 20 percent increase over the prior year. Slightly over 17 percent of the teleworkers counted in 2000 are new to telework. While 16.5 million teleworkers in the US work at home at least one day per month, only 9.3 million U.S. teleworkers actually telework at least one full day per week. Half of them work for organizations with at least 1,500 employees.

Most teleworkers are home-based, meaning that they work out of their home on teleworking days. However, some use telework centers, while others use a mixture of the two, as follows:

Type of Teleworker	Proportion
Solely home-based	89%
Solely telework center based	7%
Both home and telework center based employees	4%

More than half of teleworkers counted in 2000 are employees of companies, while some are contract workers, and others are self-employed or operate home businesses. Each type of employee may be either home-based, or might use a telework center, as follows:

Type of Worker	Home-based	Telework Center
Employees	54%	61%
Contract workers	13%	18%
Teleworking operators of home businesses	9%	4%
Self-employed teleworkers	27%	18%

Trip Time and Distance

Approximately 80 percent of the home-based teleworkers drive alone to work on non-telework days. Their one-way commuting distance averages 19.7 miles, with a round trip commuting time of about 63 minutes. The average commuting distance for non-teleworkers is 13.3 miles, with a 45-minute round trip commute time.

Technology Usage

Based on data from Telework America, teleworkers tend to be heavier users of computer technology, with an average ownership of one PC for work and another for non-work purposes, compared to 0.8 PCs for work and 0.5 PCs for non-work averaged by non-teleworkers.

Half of teleworkers claim to use e-mail at least 3 hours per week, while teleworkers actually average 7 hours per week of e-mail usage. Employers cover all costs of equipment and maintenance only in 29 percent of cases, while 46 percent of teleworkers pay for both equipment and maintenance with no contribution from employers. Less than 20 percent of teleworkers receive intensive training in the use of their technology. More than three-quarters of home-only teleworkers have analog modems to connect to their employers or the Internet. DSL is the leading wideband digital alternative, with 9 percent usage among home-only teleworkers.

New York Metro Area - Teleworking Levels

The New York Metropolitan Transportation Council (NYMTC) and the North Jersey Transportation Planning Authority (NJTPA) worked together, along with cooperation from the New Jersey Transit, to conduct the Regional Travel-Household Interview Survey (RT-HIS). Detailed information was collected, using travel diaries from February 1997 through May 1998 on counties in the tri-state region. This report provides information about teleworking days, compressed workweeks, mode of travel, travel distance, number of trips, and work versus non-work trip comparisons. Information was collected from 27,369 individuals in 11,264 households, representing 90,764 trips. The greater New York household survey places home based businesses in the same category as work at home and, therefore, shows higher levels of participation in teleworking. Some general characteristics are that:

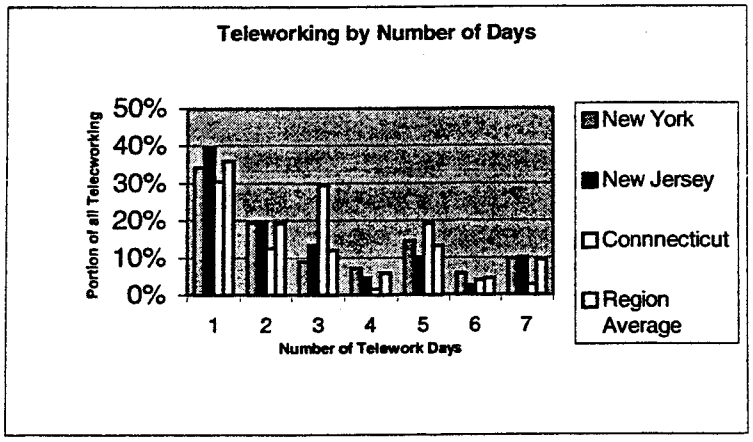
- The 19 million residents of the New York-New Jersey Metropolitan area average 3.2 trips per person per household on weekdays and 3.1 trips per person per household on Saturday and Sunday.
- More than ¾ of weekday trips are made locally within a single county.
- Three in 10 weekday trips involve the workplace.
- About 18 percent of trips are between home and work, with no additional stops in-between.
- As work-related trips are longer than other trips, they constitute 40 percent of total weekday travel time.
- Trips to and from Manhattan are made mostly using transit – 63 percent for trips headed to Manhattan and 55 percent for trips from Manhattan.
- Overall, 68 percent of all weekday suburban trips are made by auto, compared to the national average of 86 percent.

Teleworking Levels

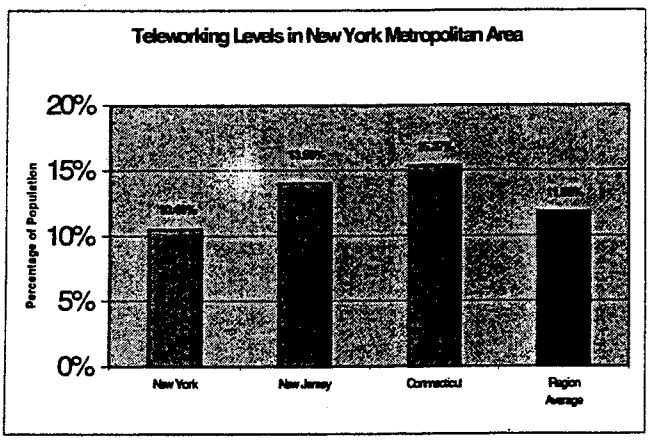
Based on the data analyzed from the RT-HIS, it is possible to determine the levels of teleworking in the region. These estimates, however, include teleworkers and home-based businesses. Unfortunately, this database was not developed to distinguish between these categories.

In the greater New York Metro Area, approximately 11.9 percent of workers telework at least one day per week, but only 7.6 percent telework two or more days per week.

The number of days that people generally telework is fairly constant across all regions, except for an unusually large number of people teleworking three days per week in Connecticut. See chart below for a breakdown across all regions:



Data from the survey indicates that, on average, 11.9 percent of the workers in the region telework, with a high of 15.4 percent in Connecticut and a low of 10.5 percent in New York.



Trip Time and Distance

Although the average number of weekday trips per person is 3.2, the number drops to 2.7 trips within the five boroughs of New York City and 3.1 trips per person per household in Hudson-Essex-Union Counties in New Jersey.

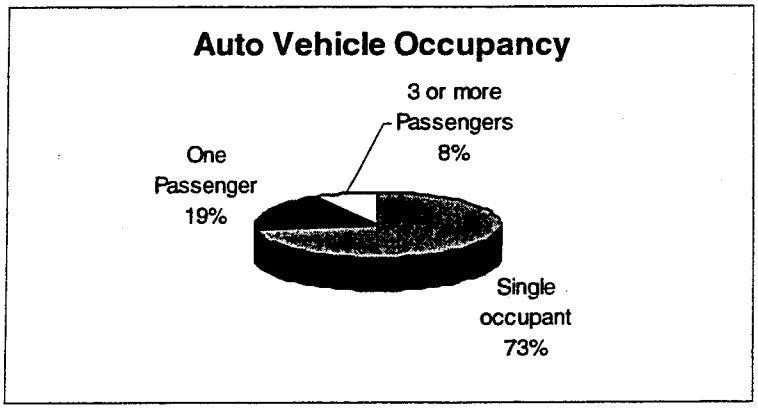
The average weekday trip (for work or other purposes) takes about 24 minutes and is about 7 miles long, with an average speed of about 17 miles per hour (mph). The average distance traveled to work is about 10.9 miles, versus 5.6 miles for non-work trips. Vehicle trip lengths and duration vary when automobiles are the mode of transport. The following table shows trip length per mode.

Trip Mode	**Average Distance (Miles)**	**Average Commute Time (Minutes)**
Automobile	8.7	21
Transit	8.6	49
Commuter rail	28.0	88
Express Bus	19.8	77
Taxi or Group Ride	4.4	21

Almost half of commuter rail, express bus, and ferry users walk to the rail, bus, or ferry. The breakdown of modes of transport is as follows:

Access to Transport Mode	**Users**
Walk	48.9%
Drive and Park	32.2%
Dropped off (vehicle)	8.0%
Connecting local bus	11.0%

The majority of weekday auto trips are single occupant trips, with the following breakdown:



Teleworking in New York State

In New York, approximately 10.5 percent of workers telework one day or more per week. Manhattan has the greatest share of teleworkers (11.2 percent). The lowest levels of participation are in Queens (3.1 percent) and Nassau County (3.3 percent). There is little difference in teleworking overall between the five boroughs and other surrounding counties.

In New York City, automobiles are used for about one-third (36.6 percent) of weekday trips, with another one-third (31 percent) made by walking and slightly under one-third (29.4 percent) by public transit.

Modes of Transport - NY

In New York State, 37 percent of workers drive their cars to work, although only 5.5 percent of Manhattan residents drive their own cars. Another 15 percent of workers indicate that they are passengers in another person's vehicle. The greatest number of solo drivers are found outside of the five boroughs, including Nassau County (58.1 percent), Suffolk County (66.2 percent), Westchester County (55 percent), Rockland County (57 percent), and Orange County (56.5 percent). A significant 46.7 percent of all Staten Island workers drive their own vehicles to work. The breakdown on usage of various modes of transport is as follows:

Mode of Transport	Usage
Auto Driver	37.0%
Auto Passenger	15.0%
Commuter Rail	1.4%
Ferry	0.2%
Subway and other Rail	10.0%
Express Bus	0.3%
Local Bus	5.0%
School Bus	1.8%
Taxi or Group Ride	8.8%
Walk	19.9%
Other	0.8%

Travel Time and Distance - NY

Within all New York counties except for Orange and Dutchess Counties, the average weekday trip distance is 5.8 miles and the average travel time is 26.4 minutes. Within Orange and Dutchess Counties, the average trip distance is 10.4 miles and the average travel time is 22 minutes. Within New York, the average single driver vehicle travels 7.6 miles, with duration of 22.3 minutes of travel time.

Teleworking in New Jersey

Approximately 14 percent of New Jersey workers telework. Of those, 8.3 percent telework one or two days per week. The counties with the largest share of workers teleworking one or more days per week are Bergen (16 percent), Somerset (18.7 percent), Monmouth (16 percent), and Hunterdon (21.2 percent). Hudson County has the smallest number of teleworkers, with only 9.3 percent teleworking one or more days per week. The county with the most workers teleworking four or five days is Hunterdon, with 3.6 percent of its workforce teleworking four or five days per week and 13.3 percent teleworking one or two days per week.

Modes of Transport - NJ

In New Jersey, 56.2 percent of workers drive their own cars to work and another 21.5 percent of workers indicate that they are passengers in another person's vehicle. The greatest numbers of solo drivers are found in Hunterdon County (64.3 percent), Morris County (62.8 percent), Sussex County (62.3 percent), and Somerset County (61.4 percent). In all other counties, except Hudson County, between 50 percent and 60 percent of workers drive their cars to work. In Hudson County, 32.1 percent of workers drive their car to work. Walking is the next greatest mode of transportation, with 8.1 percent of workers indicating that they walk to work. The breakdown on usage of various modes of transport is as follows:

Mode of Transport	Usage
Auto Driver	56.2%
Auto Passenger	21.5%
Commuter Rail	1.0%
Ferry	0.0%
Subway and other Rail	1.1%
Express Bus	0.8%
Local Bus	1.5%
School Bus	3.4%
Taxi or Group Ride	6.1%
Walk	8.1%
Other	0.3%

Travel Time and Trip Distance - NJ

The average trip distance is 8.4 miles and the average travel time is 21.2 minutes. The average travel distance for a single driver vehicle is 9.4 miles, with a travel time of 20.4 minutes.

Teleworking in Connecticut

In Fairfield County, 15.4 percent of workers telework one or more days per week, while 6.6 percent telework one or two days per week and only 3.2 percent telework four or five days per week.

Modes of Transport – CT

In Connecticut, close to 82 percent of workers commute to work via automobile, with 61.6 percent driving their own cars and 20.2 percent traveling as passengers. The breakdown of all modes of travel is as follows:

Mode of Transport	Usage
Auto Driver	61.6%
Auto Passenger	20.2%
Commuter Rail	2.3%
Ferry	0.0%
Subway and other Rail	0.2%
Express Bus	0.0%
Local Bus	1.2%
School Bus	4.4%
Taxi or Group Ride	5.8%
Walk	3.9%
Other	0.2%

Travel Time and Trip Distance - CT

The average trip distance is 9.7 miles and the average travel time is 20.4 minutes.

Telecommute Connecticut! Data

Telecommute Connecticut!, a state-sponsored program administered by Rideworks, has conducted extensive research on teleworking behavior in Connecticut. This research includes employer and employee surveys completed in 2000, with data gathered from 3,000 worksites and 2,601 employees. The objectives of the surveys were to:

- Track changes in number of worksites permitting teleworking by employees,
- Assess current attitudes of employers not currently permitting teleworking, identify opportunities for marketing, and identify barriers to adoption of teleworking,
- Determine the percentage of workers who telework regularly,
- Profile characteristics of current teleworkers,
- Obtain data to calculate savings in vehicle miles traveled ("VMT"), and

- Learn more about the potential for adopting telework among those employees who do not currently telework.

Telecommute Connecticut!'s results state that:

- Seven percent of all Connecticut workers telework at least one day per month, compared with 9 percent of workers nationally who telework at least one day per month,
- Teleworkers work at home an average of just over two days per week,
- One-third of all teleworkers work part-time, while 20 percent of all workers work part-time,
- Teleworkers travel an average of 25.5 miles to their worksite, compared with non-teleworkers who travel an average of 14.2 miles,
- Statewide, 117,000 people telework, and
- Teleworking in Connecticut reduces vehicle miles traveled by 37.2 million per month.

Key findings from the employer survey were:

- The percentage of Connecticut worksites offering telework has remained constant (8 percent) since Telework Connecticut!'s 1997 survey.
- There has been a 74 percent increase in the number of teleworkers per worksite, and a 91 percent increase in telework days per week, a substantial increase since the 1997 survey by Telework Connecticut!
- Seventeen percent of employers with teleworking use a formal personnel policy governing eligibility; 16 percent of teleworkers do so with a written policy or agreement.
- Thirty percent of employers said that supervisors and teleworkers are required to put terms of the arrangement in writing.
- Supervisors of teleworkers must do a better job managing employees (81 percent).
- Bottom-line benefits are hard to measure (78 percent).
- Teleworking has been a good thing for their worksite (78 percent).

Employers were provided with a list of advantages and acknowledged the following teleworking benefits from that list:

- Retention of employees (74 percent),
- Improved employee morale (59 percent),
- Improved competitiveness in attracting new employees (48 percent), and
- Improved productivity by teleworkers (43 percent).

Some disadvantages were also perceived:

- Inability to hold spur of the moment meetings (61 percent),
- Loss of managerial/supervisory control (43 percent),

- Cost of providing equipment and phone lines (43 percent), and
- Inability to assess teleworker productivity (43 percent).

Employers who currently use telework forecasted slow expansion. Those who have not adopted it were less likely to foresee its implementation. No companies that currently use teleworking expect to discontinue it in the future. Only 7 percent of those organizations that do not currently allow teleworking actually made a clear decision against using it. Of those companies that do not allow teleworking, the following reasons were cited:

- Employees must be at the worksite to perform their jobs (37 percent).
- Employees need access to paper files and materials that cannot leave the site (50 percent).
- Teleworking would only work for some jobs (48 percent).
- Employees use machines or equipment that they cannot access remotely (45 percent).
- Work is team oriented and co-workers must be together every day (44 percent).

Other reasons cited for not allowing teleworking were:

- Customers, clients, or vendors wouldn't like it (37 percent).
- Management wants everyone accessible at all times (35 percent).
- Things are "fine they way there are – no reason to change" (31 percent).
- They see no reason for flexible work arrangements (30 percent).
- They would have to upgrade technology to make it possible (28 percent).
- They never considered it a possibility (27 percent).
- Equipping employees would cost too much (25 percent).

Employers indicated that they might be encouraged to adopt or expand teleworking if there were a clear demonstration of business benefits, proof of economic advantages, or better/less costly technology to support teleworking.

Summary

Telework has grown considerably in the past decade. In 1990, there were approximately 3.4 million teleworkers in the United States. By 2000, there were approximately 23.6 million. A Year 2000 study completed by Telework America (TWA) identified approximately 23.6 million teleworkers in the United States, a 20 percent increase over the prior year.

Based on data compiled from the Regional Travel-Household Interview Survey (RT-HIS) 1997-98, in the New York Metro area, approximately 11.9 percent of workers telework (home-based businesses and those who are employed and work at home) at least one day per week, though only 7.6 percent telework two or more days per week. The highest telecommuting rate is in Connecticut, where 15.4 percent of workers telework, and the lowest rate is in New York, where 10.5 percent of workers telework. Approximately 14

percent of New Jersey workers telework. It should be noted however, that this data, which is based on the Regional Travel-Household Interview Survey (RT-HIS), includes individuals with home-based businesses. From the RT-HIS study, it was not possible to deduct the quantity or proportion of home-based businesses from those who work at home.

Chapter 4: Proposed and Existing Policies Regarding Telework

Considerable legislation exists which supports the increase of telework in the New York, New Jersey and Connecticut regions. Most of these bills are pending approval. The chart at the end of this section provides a quick overview.

Proposed and Existing Federal Legislation

Transportation Equity Act for the 21st Century (TEA-21), P.L. 105-178, as amended

The Congestion Mitigation and Air Quality Improvement (CMAQ) program was authorized in TEA-21. The purpose of the CMAQ program is to fund transportation projects or programs that will contribute to attainment or the maintenance of the national ambient air quality standards for ozone and carbon monoxide. Planning, technical and feasibility studies, training, coordination, marketing, and promotion are eligible activities under CMAQ. Physical establishment or construction of telework centers, computer and office equipment purchases, and related activities are not eligible.

P.L. 106-69, Section 365, and P.L. 106-24, Section 2603

In order to address air quality concerns through teleworking, Congress enacted Section 365, P.L. 106-69, the Department of Transportation and Related Agencies Appropriation Act, 2000. P.L. 106-69, Section 365 proposes pilot programs to explore providing an incentive for businesses to implement telework programs by creating an emissions credit trading and exchange system. By reducing vehicle miles traveled (VMT), companies could generate potential emissions credits by reducing air pollutants, which the company could then exchange or sell to other companies. For example, utilities and manufacturers may be potential buyers of these credits. Additionally, states may wish to include emission reductions from teleworking as baseline adjustments State Implementation Plan (SIP) credits, or state transportation planning.

P.L. 106-24, Section 2603 allows for the implementation of pilot emissions trading programs in five regions of Washington, D.C., Los Angeles, Houston, Philadelphia, and Denver.

S. 521; H.R. 1012, 107th Congress

On March 13, 2001, Senator Rick Santorum introduced S. 521, the "Telework Tax Incentive Act," which was then referred to the Committee on Finance. At the same time, on March 13, 2001, Representative Frank R. Wolf introduced H.R. 1012, the "Telework Tax Incentive Act" bill, which was referred to the Committee on Ways and Means and is currently pending consideration. The bills call for an amendment to the Internal Revenue Code of 1986, to allow a credit against income tax for expenses incurred in teleworking. The bills cite potential reduction in a variety of air pollution emissions if 10 to 20 percent of commuters switched to teleworking, based on the average American commuting 44 miles and 62 minutes daily. The bills grant employees the option of deducting expenses

incurred while teleworking, provided that the employee works under a "teleworking arrangement" not less than 75 days per year. Expenses include such items as furnishings and electronic information equipment that are used to enable the individual to telework. The expenses an individual is permitted to deduct may not exceed $500. In the event the employee teleworks for less than a full year, the $500 maximum is reduced by the same ratio as the number of months in which the individual is not in a teleworking arrangement. In other words, if the employee teleworks for six months, or half, of the year, the maximum allowable tax deduction would be $250. At this time, neither bill has been enacted.

S. 522; H.R. 1035, 107th Congress

On March 14, 2001, Senator John F. Kerry introduced S. 522, the "Small Business Telecommuting Act," directing the Administrator of the Small Business Administration to "conduct a pilot program to raise awareness about teleworking among small business employers, and to encourage such employers to offer telecommuting options to employees." The bill was referred to the Committee on Small Business. On March 14, 2001, Representative Mark Udall introduced H.R. 1035, the "Small Business Telecommuting Act" to the House of Representatives. From there, it was referred to the Committee on Small Business.

Both S. 522 and H.R. 1035 call for the Administrator of the Small Business Administration to make special efforts to do outreach to businesses owned by or employing individuals with disabilities and disabled American veterans. It directs the Administrator to produce educational materials and conduct presentations designed to raise awareness in the small business community of the benefits and the ease of teleworking and to provide outreach to small businesses that are considering offering teleworking options. The Administrator is required to transmit a report to the Committee on Small Business of the House of Representatives and the Senate with the results of an evaluation of the pilot program, no later than two years after the first date on which funds are appropriated to carry out the Act. At this time, neither bill has been enacted.

P.L. 106-346, Section 359

Under section 359 of the Department of Transportation and Related Agencies Appropriations Act, 2001 (P.L. 106-346), directs each executive agency to establish a policy in which eligible employees may participate in telecommuting to the maximum extent possible without diminished employee performance. It requires the Director of the Office of Personnel Management to provide that such requirements are applied to 25 percent of the Federal workforce and to an additional 25 percent of such workforce each year thereafter.

Proposed and Existing New York-Legislation

Assembly Bill 953

Assembly Bill 953, co-sponsored by Assemblymen Kevin Cahill (Ulster County) and Felix Ortiz (Kings County), and multi-sponsored by Robert K. Sweeney (Suffolk County), was introduced to the State Assembly on January 9, 2001, and subsequently referred to the Committee on Labor. The proposed bill cites the "very promising future" of telework as a way to improve the balance between work and family life for employees, as well as a means for businesses to save money by reducing real estate costs, reducing worker's compensation premium contributions, and reducing absenteeism. The bill also cites the accompanying benefit of reduction in air pollution and traffic congestion.

The bill, cited as the "Telework 2001 Act," calls for the creation of a task force and demonstration program on teleworking to study the impacts and benefits of telework. The task force is to be composed of departments of:

- Environmental Conservation,
- Transportation,
- Civil Service,
- The Workers' Compensation Board,
- The Office of General Services, and
- The Office of Advocate for Persons with Disabilities.

The task force is to establish a pilot program and study, working with five Primary State Employers including Banks, Insurance, Health, Housing, and Transportation.

During the first of two phases of the project, the task force shall use an Employee Profile Questionnaire to identify positions and employees who are eligible to telework. Once employees have been selected, the second phase of the project will be a telework pilot program, consisting of an actual study on the benefits or detriments of telework. After completion of the eighteen-month study, the task force is to present its findings in a final report to the Governor, as well as the New York State Senate and Assembly. The report will also include determinations and recommendations of the task force. As of this printing, this bill has not been enacted into law.

Proposed and Existing New Jersey-Legislation

Assembly Bill 2648

On November 23, 1998, Assemblyman Michael Patrick Carroll, of Morris County, NJ (District 25), introduced Assembly Bill 2648. The bill was referred to Assembly Commerce, Tourism, Gaming and Military and Veterans' Affairs Committee, which provided amendments on January 21, 1999. The legislation grants a tax credit for corporation business tax and gross income tax for employers who allow employees to

telework. The bill defines a "qualified residential telecommuting employee" as "a salaried or hourly employee who, pursuant to a written residential telecommuting work arrangement between the taxpayer and that employee, regularly performs a portion of the services that are part of that employee's normal workweek in the employee's residence [in the State of New Jersey] without making any work-related commute trips on the day or days that the employee is teleworking, and is not directly supervised in the performance of the employee's duties while at the employee's residence."

The tax credit allowed is equal to one percent of the portion of wages and salaries that are paid to employees for the part of the workweek that the employee regularly teleworks. For example, if the employee teleworks for two out of the five workdays per week (2/5 or 40 percent), the credit of one percent is calculated based upon 40 percent of the total remuneration paid to the employee. For example, for an employee with a salary of $50,000, the tax credit would be equivalent to $200 (40% x $50,000 x 1% = $200). The tax credits can be applied to tax otherwise owed for the taxable year, or they can be carried over for up to seven years if the credits exceed allowable limits in any given year. In order to obtain the tax credit, employers must file a form with the Director of the Division of Taxation, listing specifics of the employee's schedule and salary.

In the First Reprint of the bill, dated September 3, 1999, the cost to the state of the bill was estimated using a study of the Institute of Transportation Studies (ITS) at the University of California, Davis, which uses estimates of the demand for teleworking in California. Applying the California estimates to New Jersey employment levels in 1998, it is estimated that as many as 240,000 workers could be teleworking an average of 1.2 days per week. Using 1997 income data provided by the New Jersey Department of Labor in April 1999, suggesting an average daily salary of $200, the estimated tax loss for either or both of the State's two income taxes (corporate business and gross income tax), is an average of approximately $28 million.

Proponents of the bill outline benefits to New Jersey communities through reduced VMT by New Jersey commuters and, thus, reduced dependence on gasoline to fuel commuter trips. The result would be improved air quality from reduced pollution. Proponents also cite employee benefits, including reduced stress due to lessened commute times, improved morale, and better work/life balance, including time spent with family and friends. Opponents of the bill argue that the tax incentive may be too low for a company to be bothered with the requisite paperwork and incremental cost of providing employees with the technological tools to work at home.

Assembly Bill 1193

District 13 Assemblyman Joseph Azzolina, pre-filed the "Family Home Occupation Act" for introduction in the 2000 session of the 209th Legislature. The bill "classifies certain home occupations as accessory uses [of a residence] needing no use variances in residential zones; authorizes municipalities to limit or exclude certain warehousing, manufacturing or retailing activities." The bill was passed by the Assembly on June 28, 2001; an identical bill S. 2069 is pending in the Senate.

The bill recognizes the rise in home-based businesses, citing that:

In New Jersey alone, 6,000 family home occupations are started each month. Over the past decade, New Jersey gained over a quarter million new home-based, service-oriented businesses.

The bill acknowledges that many family home occupations are operating in violation of outmoded local ordinances, most of which were enacted in the 1960s and 1970s to protect residential neighborhoods from the negative effects of industry. In keeping with the original intent of that legislation, the Family Home Occupation Act specifies that the home business activity be compatible with the residential use of the property and indicates that:

"(a) the activity is compatible with the residential use of the property and surrounding residential uses;

(b) the activity employs no employees other than family members residing in the dwelling or unit [unless otherwise provided by ordinance];

(c) the volume of invitees or guests who visit the residential dwelling or unit is not in excess of what is customary for residential use in the neighborhood;

(d) there is no outside appearance of a family home occupation including, but not limited to, parking, signs or lights;

(e) the volume of deliveries or truck and other vehicular traffic is not in excess of what is normally associated with residential use in the neighborhood;

(f) the activity uses no equipment or process that creates noise, vibration, glare, fumes, odors or electrical or electronic interference, including interference with radio or television reception, detectable by any neighbors;

(g) the activity does not generate any solid waste or sewage discharge, in volume or type, which is not normally associated with residential use in the neighborhood; and

(h) the activity does not involve any illegal activity."

The bill also allows a municipality to establish standards related to the number of invitees or guests that will be deemed acceptable in residential districts, as well as standards for the volume of deliveries that should be allowed.

Legislative Statute 27:1B-21.18

New Jersey Legislative Statute 27:1B-21.18 specifies that "No later than January 1, 2001, the Chief Executive Officer and Secretary of the New Jersey Commerce and Economic Growth Commission, in consultation with the commissioner and the State Treasurer, shall submit a report to the Legislature containing a program to identify sectors of the

economy, or specific occupations, which are appropriate for telecommuting to increase teleworking in the State."

In a report to the Legislature prepared by the New Jersey Commerce and Economic Growth Commission, New Jersey Department of Transportation and New Jersey Department of Treasury, teleworking is defined as a work arrangement in which employees perform work during business hours at home or at "telecenters" that are closer to their homes. The report states that, a "fundamental characteristic of teleworking is that it substitutes for a trip that would otherwise be made to a traditional worksite or reduces the distance the employee travels to work."

The report suggests that "to achieve the statutory goal of increasing teleworking in the State, more information is needed to identify the extent of employers' and employees' interest in teleworking and specific telework information and assistance needs," citing a limited New Jersey-specific data. It recommends that New Jersey-specific data be collected through commuter surveys and employer surveys. It also suggests that if the surveys demonstrate an interest among commuters and employers, the State might wish to promote programs or policies to increase teleworking in New Jersey; e.g., an outreach program about teleworking to employers and commuters. It additionally suggests that the State "explore opportunities for State Planning practices to encourage teleworking....through tax benefits to employers for expenses incurred in offering teleworking to employees." It further suggests that the Legislature review labor compliance and liability issues and zoning regulations that might inadvertently hinder teleworking.

Connecticut

Regulations of Department of Transportation Concerning Voluntary Traffic Reduction Program

The State of Connecticut Regulations of Department of Transportation has added new sections 13b-38o-12 through 13b-38o-17 related to its Voluntary Traffic Reduction Program, defined in section 13b-38 of the Connecticut General Statutes, which require the Commissioner of Transportation to adopt regulations for a voluntary traffic reduction program. The program encourages employers to develop programs to increase ridesharing and mass transit use by employees.

Employers who wish to participate are required to submit information about employer name, address, and principal place of business as well as the name, title and address of the designated contact person, the employer tax ID number, the Federal employer ID number, the address of each work location where there will be a Traffic Reduction Program, and the number of participating employees.

Employers are required to submit a traffic reduction plan, using the format set out by DOT containing:

- A work location description and its transportation-related characteristics,
- A list and description of measures to be implemented,
- The name, title, phone number, mailing address and signature of the designated employee traffic coordinator for the work location, and
- A list and description of any related commuter benefits or allowances to be provided.

Employers are required to submit a written report within one year of submission of the original traffic reduction plan, which details results of implementation, as well as measures the employer may implement within the next year to further reduce vehicle trips.

Employers are required to maintain records in the office for at least five years after they are first generated.

The Connecticut DOT Voluntary Traffic Reduction Tax Credit Program

Connecticut DOT offers tax incentives for those companies in Connecticut's non-attainment area which have more than 100 employees and which encourage employees to use transit, ridesharing services, or means of commuting other than driving alone to work. The areas affected are all of the towns in Fairfield County, except Shelton, and the towns of New Milford and Bridgewater. A company can receive up to 50 percent of its traffic reduction expenses or $250 per participating employee (whichever is lower). The tax credit a company receives could be reduced if tax credit applications from all companies in a year exceed $1.5 million.

To receive a tax credit, a company must:

- Complete and submit a two-page form describing its traffic reduction activities (the traffic reduction plan),
- Complete and submit a one-page tax credit application form to the Connecticut DOT, citing the amount of money the company spent on its program and the number of participating employees, and
- Receive a "certification" of approved credit from the Connecticut DOT. The company can then claim the credit on an amended tax return submitted to the IRS.

The tax credit program is administered through the Connecticut DOT.

Summary of Legislation and Legislative Proposals

Requirement or Proposal	Where	Description	Date Introduced	Status
P.L. 105-178	Federal	P.L.105-178, as part of the Transportation Equity Act for the 21st Century, the Congestion Mitigation and Air Quality Improvement (CMAQ) program funds transportation projects or programs that contribute to attainment or maintenance of the national ambient air quality standards for ozone and carbon monoxide.		In effect
P.L. 106-69, Sec. 365, and P.L. 106-24, Section 2603	Federal	P.L. 106-69, Section 365, requires the design of pilot programs by creating an emissions trading program for teleworking. P.L. 106-24, Section 2603 allows for implementation of emissions trading programs in five regions of LA, Houston, DC, Denver and Philadelphia.		In effect
S. 521; H.R.1012	Federal	S. 521, the "Telework Tax Incentive Act" allows a credit against income tax for expenses incurred in teleworking.	3/13/2001	S. 521 was referred to Committee on Finance; H.R. 1012 was referred to the Committee on Ways and Means.

Requirement or Proposal	Where	Description	Date Introduced	Status
S. 522; H.R. 1035	Federal	S. 522, the "Small Business Teleworking Act," directs the Administrator of the Small Business Administration to "conduct a pilot program to raise awareness about teleworking among small business employers and to encourage such employers to offer teleworking options to employees."	3/14/2001	Referred to Committee on Small Business; H.R. 1035 was referred to the Committee on Small Business.
H.R. 5394 (enacted into law by P.L. 106-346) Sec. 359	Federal	Section 359 calls for appropriations to Federal agencies to establish telecommuting policies and programs for eligible employees.		In effect
AB 953	State – NY	Referred to as the "Telework 2001 Act," this bill calls for creation of a task force and demonstration program on teleworking to study the impacts and benefits of telework.	1/9/2001	Referred to Committee on Labor
AB 2648	State – NJ	This proposed legislation grants a tax credit for corporation business tax and gross income tax for employers who allow employees to telework.	11/23/98; amendments on 1/21/99	Referred to Assembly Commerce, Tourism, Gaming and Military and Veterans' Affairs Committee
AB 1193	State – NJ	A.B. 1193, the "Family Home Occupation Act," classifies certain home occupations as accessory uses of a residence, which need to use variances in residential zones. Bill may protect teleworkers.	1/21/2000	Passed by the Assembly on June 28, 2001; awaiting Senate action.

Requirement or Proposal	Where	Description	Date Introduced	Status
Statute 27:1B-21.18	State – NJ	This statute requires the preparation of a report on NJ occupations suited for telework.		In effect
General Statutes, §13b-38	State – CT	State DOT offers tax incentives for those companies in Connecticut's non-attainment area that encourage employees to use means of commuting other than driving alone to work.		In effect

Chapter 5: Conformity and State Implementation Plan Analysis

Several empirical studies have been conducted in the past 20 years to document the impact of teleworking on travel behavior.[3] Based on these studies, teleworking has been shown to reduce both the number of vehicle trips and vehicle miles traveled. Furthermore, although teleworkers generate trips on teleworking days, the net impact on vehicle miles and vehicle trips is still positive. To stay within transportation conformity budgets (described further below) and to develop and enforce state implementation plans (described further below) that meet Federal requirements, many regions are using teleworking as a viable strategy for reducing vehicle trips and miles traveled. Two examples include the Metropolitan Washington Council of Governments' and the Southern California Association of Governments' use of telework to meet transportation conformity/air quality.

All metropolitan areas where air quality violations have been measured have been assessed by the U.S. Environmental Protection Agency (EPA), and some have been designated as non-attainment for one or more pollutants. All non-attainment areas are required to prepare a plan that will bring the area into compliance. This plan is called a State Implementation Plan, or SIP, and must be accompanied by enforceable rules, enacted legislation, or other legal commitments to put the plan into effect. It must also be accompanied by computer modeling showing that the emission reduction measures adopted will bring about a reduction in pollutant levels protective of public health. Although some emission reduction measures are required (such as inspection and maintenance programs), the state has considerable leeway in deciding how to reduce emissions. In addition, the EPA has recently published guidance on taking SIP credit for reductions resulting from voluntary programs, such as teleworking. The agency responsible for the SIP is the state air quality agency, although some functions may be delegated to local agencies with EPA's concurrence.

The Clean Air Act Amendments of 1990 also contained a provision that requires all federally funded transportation projects and all major projects not supported by Federal funds to conform to the air quality goals of the state. Transportation projects must be consistent with the objectives of the SIP and must demonstrate that they will not interfere with attainment of the air quality standards. Specifically, transportation plans, programs, and projects cannot:

- create new violations of the Federal clean air standards,
- increase the frequency or severity of existing violations of the standards; or
- delay attainment of the standards.

The agency responsible for analysis of transportation plans and projects for conformity is the Metropolitan Planning Organization (MPO). Periodically, the MPO must provide a projection of growth in vehicle miles traveled (VMT) for a period of twenty years. These

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[3] State of California, the Puget Sound region, Metropolitan Washington Council of Governments, AT&T, the Southern California Association of Governments, the County of San Diego, and Bell Atlantic pilot programs and the International Telework Association and Council's Telework America Surveys.

projections are used to estimate emissions from the transportation sector and take into account all transportation control measures, improvements in vehicle technology, and other factors that could influence emissions. These estimates are known as the conformity budget and are made for each year over the twenty-year period. New transportation projects are assessed against this baseline.

Any proposed project (for example, a new highway) must show through a computer modeling analysis, using anticipated changes in VMT, speeds, traffic counts, and other variables, that the project would not increase emissions of nitrous oxide, carbon monoxide or volatile organic compounds that would lead to new violations, increases in existing violations, or delays in attaining the clean air standards. Regional transportation plans are also subject to conformity analysis, conducted by the state Department of Transportation.

To better understand current and future requirements for trip reductions or decreases in VMT promulgated by state or local air quality agencies, the SIP and transportation conformity analyses for each state in the greater New York region were reviewed. In addition, interviews were conducted with air quality agency personnel to determine whether teleworking was assumed in either the SIP or the conformity analyses.

Conformity Budgets

The following provides the conformity budgets for the three regions.

New York

New York's 1999 transportation conformity budget for VOC and NOx is:

VOC 294.7 tons/day
NOx 322.6 tons/day

The responsible agency is the New York State Department of Environmental Conservation.

New Jersey

The New Jersey conformity budgets for the 15 percent reduction and the 9 percent Rate of Progress reductions have been approved by the EPA. For northern New Jersey, these budgets are:

VOC 93.20 tons/day
NOx 175.51 tons/day

The responsible agency is the North Jersey Transportation Planning Authority.

Connecticut

VOC	9.7 tons per summer day (tpsd)	severe area
	30.0 tpsd	serious area
NOx	23.7 tpsd	severe area
	79.6 tpsd	serious area

The responsible agency is the Connecticut Department of Environmental Protection.

Based on interviews with EPA staff from Regions 1 and 2, neither area currently uses telework credits specifically in their conformity analyses.

State Implementation Plans

New York

New York has no provisions for teleworking in its current SIP. Teleworking is not being seriously considered as a trip reduction strategy at this point. There are also no institutional "champions" promoting or implementing teleworking in the region.

New Jersey

New Jersey's attainment demonstration and plans do not include any provisions for teleworking. The required reductions in VOC and NOx emissions will be made up through the use of reformulated gasoline, enhanced inspection and maintenance, certain Federal programs, and stationary source NOx controls.

Connecticut

Connecticut's plans do not include any provisions for teleworking. The control strategy for meeting target emission reductions "consists of the continued enforcement of measures EPA approved as part of the State's 15 percent emission reductions plans (March 10, 1999), coupled with emission reductions from the State's NOx control strategy for large industrial point sources, Federal non-road engine standards, and Connecticut's Low Emission Vehicle program. All of these control measures are approved as part of Connecticut's SIP."

Summary

A review of the SIPs and transportation conformity analyses for New York, New Jersey, and Connecticut revealed that "no assumptions" were made concerning teleworking and no air pollution credit was taken for teleworking programs. Interviews with air quality agency staff confirmed this finding, and staff members from all three states also confirmed that there were currently no plans to do so in the future.

Given the difficulties in finding and enforcing emissions reduction strategies in the mobile source or transportation sector, some states have turned to voluntary measures such as teleworking. Since teleworking programs have shown great potential as a strategy for reducing trips and VMT, policy makers and planners may want to consider their use for achieving transportation conformity and meeting SIP requirements.

Chapter 6: Telework Service Providers

Publicly funded teleworking resources are often available to employers through a variety of sources. These include the metropolitan planning organizations, transportation management organizations (TMAs), rideshare organizations, state agencies, or branches of regional/local government. Vendors and private consultants also offer assistance for a fee.

TMAs in the greater New York region play a major role in working with employers to offer alternatives to driving alone. TMAs are public-private partnerships formed to provide a forum for employers, developers, building owners, local government, and others to address local transportation and air quality issues. TMAs typically work closely with employers to design and implement alternative transportation programs. Most TMAs broker transportation services and also offer assistance on implementing carpooling, vanpooling, transit, alternative work hours, and telework programs.

The following provides an overview of existing resources in each state.

New York-Public Resources

Three sources for assistance with teleworking were identified in the immediate New York area. These include:

CommuterLink

CommuterLink is a TMA, founded in 1989 as E-Z Rider, and has been operating as CommuterLink since 1996. The primary goal of CommuterLink is to promote and encourage ridesharing and other modes of alternative transportation in order to reduce congestion and improve air quality and mobility. CommuterLink provides people who work in any of New York's five boroughs with computerized ridesharing assistance, transit commute itineraries, a guaranteed ride home program for its members, parking management programs, and other trip reduction strategies. The customized rideshare program, supported by an extensive database of commuters traveling within New York State, matches commuters who live and work close to each other and work a similar schedule.

CommuterLink also provides services to employers including on-site assistance, parking management, flexible work schedules, teleworking, ozone action, and business relocation. CommuterLink's website provides information about the costs of commuting, as well as the environmental impact, with high-level descriptions of hydrocarbons, nitrogen oxides, carbon monoxide, and carbon dioxide.

Long Island Transportation Management

The Long Island Transportation Management ("LITM") is a non-profit corporation supported by the public and private sectors. Its purpose is to reduce traffic congestion and to improve air quality. As such, LITM provides transportation information to

commuters and transportation demand management assistance to employers in Nassau and Suffolk Counties. Specifically, LITM's services include employee ride matching, free commute information racks with site-specific transit and rideshare information, assistance with employee commute issues resulting from relocation, and on-site commuter fairs.

LITM and the New York State Department of Transportation jointly administer a program entitled "The Commute Alternatives Program" (CAP), a voluntary program designed to assist employers in bringing various commute alternatives to the worksite. These include ridesharing, compressed work week, teleworking, and flextime programs. CAP also has a "ridematch" database, which potential carpoolers may access. In addition, the CAP program provides grants of up to $2,500 to employers that implement alternatives at their worksites.

Westchester County Department of Transportation-SmartCommute

Westchester County Department of Transportation, in cooperation with the Westchester County Association, Inc., developed Westchester's SMART COMMUTE program to help reduce traffic congestion in Westchester County by encouraging the use of commute alternatives such as buses, trains, vanpools, carpooling, teleworking, compressed work schedules, walking, biking, or any other travel mode or work arrangement that takes a single occupant vehicle off the road. Over 100 employers are enrolled in the program.

New Jersey-Public Resources

New Jersey has nine TMAs, eight of which serve a portion of the New York and New Jersey non-attainment areas. TransOptions and the Greater Mercer TMA provide more comprehensive services in the area of teleworking, while other TMAs plan to be resources in the future.

TransOptions

TransOptions, formerly MCRIDES, offers training assistance to employers and employees related to teleworking. One example is a lunchtime seminar that is presented to employees at their workplace, introducing them to the teleworking concept and providing tips for effective teleworking.

The TMA also created a worksite specific telework training program to improve managers' competence and comfort with remote management and to guide teleworkers to good teleworking habits. The program consists of one-on-one interviews with potential teleworkers and telemanagers to identify possible telework barriers. The teleworkers and telemanagers are then brought together to discuss and resolve any issues, and the decisions are documented in an agreement that spells out the teleworking schedule, reporting and communication, telework tasks, and other concerns of either the teleworker or manager.

TransOptions implemented this program at one firm, with nearly 100 employees teleworking an average of 1.5 days per week each. In a limited evaluation of the program, the TMA found that both managers and teleworkers believed the program was working well and fears they had before the program started were not realized. Managers felt that morale increased as a result of the program and that communication was maintained at the pre-telework level. Employees reported being more productive because of fewer interruptions on telework days.

Greater Mercer TMA

Greater Mercer Transportation Management Association (TMA) is a non-profit partnership of the public and private sectors supported by member dues and grants from state agencies. Greater Mercer TMA is dedicated to reducing traffic congestion and improving mobility in and around Mercer County, New Jersey and does so by providing a variety of commuter programs and services.

Greater Mercer TMA provides members with information about various alternate work arrangements, which include telework. Greater Mercer TMA provides a list of resources to assist with telecommuting. Their website also provides numerous links to other telework resources.

Connecticut-Public Resources

Telecommute Connecticut!

Telecommute Connecticut! is a free service that assists all Connecticut employers with design, development, and implementation of telework. This program is sponsored by the Connecticut Department of Transportation and is administered by Rideworks of Greater New Haven and Waterbury in cooperation with Metropool of Fairfield County and The Rideshare Company of Hartford. This program offers one-on-one assistance, a best practices guide, informational videos, a website, and a newsletter.

The program additionally provides employers with design, development, and implementation assistance for teleworking as an alternate work site option for their designated employees. They offer employers a variety of services, including:

- program goal setting,
- policy formulation,
- telephony and other technology needs analysis,
- pilot implementation and program assistance,
- training,
- cost/benefit analysis, and
- evaluation.

In addition, Telecommute Connecticut! provides case studies of companies that have successfully implemented teleworking programs and also provides information from a

variety of studies and surveys that have been completed detailing national as well as local teleworking statistics.

Summary

Telework assistance is mainly being offered through TMAs and rideshare organizations in the region. The most comprehensive program is being offered through Telecommute Connecticut! which offers information, data, and one-on-one assistance to employers in the State of Connecticut. The TMAs in New York and New Jersey offer varying degrees of assistance ranging from provision of general information to offering specialized training on teleworking.

Although the TMAs and Telecommute Connecticut! offer resources on teleworking, employers are not always aware of these services. In both New York and New Jersey, there is a need for developing greater tools and resources that can be readily available to employers for developing and implementing telework programs.

Chapter 7: Pilot Programs

Numerous corporations in the greater New York Metro area claim to have telework policies in place. In many instances, these amount to one to ten teleworking employees per organization. Most programs are also offered on an informal basis, lacking human resource policies and criteria for the program.

For this study, we have only included corporations with significant telework programs. Corporations with telework programs identified in this study include American Express Travel Related Services, AT&T, IBM, Deloitte & Touche, the New York Times, Deutsche Bank, Merrill Lynch, PricewaterhouseCoopers, Vytra Health Plans, Nabisco, Dunn & Bradstreet, Verizon, Johnson & Johnson, Telcordia Technologies, Avaya, Schering-Plough, Georgia Pacific Company, and Pitney Bowes. Case studies of these programs are available in Appendix 4 of this report.

Teleworking Programs

Company	No. of Participants	Noted Benefits (Cost or Work/Life)	Emission Reduction / Travel Benefits
NEW YORK – PILOTS			
New York State Office for Technology	105+	Reduced turnover and training expenses Improved recruiting and staff retention Improved attendance and productivity Improved employee morale Decrease in job-related expenses Decreased stress Greater empowerment Improved work/life balance	Reduced commute time
NYNEX Satellite Center	75	Gains in productivity - 25% Cost savings - $100 million Reduction in travel time – 89% Transportation cost savings - $26.05/week	37.2 million miles
NYSDOT	105	Benefit/Cost Ratio = 1.82	8,777 hours/year saved in travel time 255,600 travel miles/year saved 9,800 reduced trips/year
NYMTC	62	1 less sick day/year Telecommuter savings of $44+ / month ($12 per telecommuting day)	19,000 less vehicles per day entering central business district 95,000 fewer vehicles per day in greater NY Metro area 50 million trips/year 2.5 tons toxic emissions/day 15 million gallons gas/month 1.7 million tons carbon monoxide 220,000 tons hydrocarbons 110,000 tons NOx 50,000 tons carbon dioxide

Company	No. of Participants	Noted Benefits (Cost or Work/Life)	Emission Reduction / Travel Benefits
New York – Programs			
AT&T	27-28% of employees 30,000 + globally	Gains in productivity (employee reported) – 25% Real estate savings - $25 million Increased productivity - $100 million Reduced turnover - $18 million	carbon monoxide = 1.7M tons hydrocarbons = 220,000 tons NOx = 110,000 tons carbon dioxide - 50,000 tons 110 million miles/year 5.1 million gallons of gas/year 95,000 fewer trips/year
New York Times	5%	Not Available	Not Available
IBM	20,800 globally 95% of sales and marketing	Gains in productivity - 10 to 20% 75% real estate savings - 2M square feet Annual cost savings - $11 Million Highest levels of job satisfaction among telecommuters	
New Jersey – Programs			
Schering-Plough	128	Gains in productivity - $390,000 Increased effectiveness - $312,000 Reduced sick time - $121,000 Reduction in turnover - $1 million Overhead savings – 60 seats in office Avoidance in travel costs - $2.3 million Real estate avoidance - $840,000 in space for teleworking staff Leasing costs avoidances for space to support field staff work - $430,000 for space to support field staff work Turnover cost savings - $675,000	Avoidance in travel costs - $2.3M
American Express Travel Related Services	240+	Gains in productivity - 40% more calls per day; 20,000 new establishments signed up Increased customer satisfaction - 28% Increased employee (rep) satisfaction - 25%	
Dunn and Bradstreet	Unknown at this time	Reduced needs for office space by 20-25%	
Nabisco	Less than 100	Not Available	
Telcordia Technologies	1100+	Productivity increase - 20% Improved morale	
Johnson & Johnson	A "significant number"	80% of managers are equipped with laptops to telecommute on as-needed basis	
Georgia Pacific Company	20+ in one department; company-wide number unknown	Decrease in sick days (0 for participants) Potential annual savings of $26,000 in one department due to reduced turnover and associated costs	

Company	No. of Participants	Noted Benefits (Cost or Work/Life)	Emission Reduction / Travel Benefits
Connecticut – Programs			
Pitney Bowes	200+	Improved ability to recruit employees with expectation of flexibility 300+ employees doing something one day a week other than driving their cars to work.	Not Available
Greater New York Metro Area			
Pricewaterhouse-Coopers	110	Improved recruitment and retention More effective use of office space Improved employee morale and job satisfaction More effective use of time	Not Available
Merrill Lynch	3,500	Increased productivity - 15% Increased employee morale - 30% Sick day reduction – 3.5 days Retention/absenteeism savings - $10,000 per teleworkers	Reduction of about 95,000 trips/year
New York Times	5% of employees	Not Available	Not Available

Summary

Certain consistencies can be noted upon review of all of the companies with telework programs. While there are limited quantitative metrics, most companies have measured the qualitative, intrinsic benefits, such as work/life balance, higher employee satisfaction, improved retention, and enhanced ability, to attract talented new personnel. Companies have also noted benefits such as increased productivity, improved morale, reduced absenteeism, and real estate cost savings resulting from office sharing among teleworking employees. Many companies believe that telework is best marketed as a work/life benefit, rather than a means of reducing vehicle miles traveled or improving air quality.

Chapter 8: Steering Committee

Steering Committee Formation and Composition

A steering committee was established to provide a forum for discussion and to develop policies for greater adoption of teleworking in the region. As called for in the Conference Report accompanying the Department of Transportation and Related Agencies Appropriations Bill, 2001, representatives from local government, environmental organizations, and transportation agencies were selected to serve on a greater New York steering committee. Additionally, air and transportation agencies, transportation management organizations, rideshare organizations, metropolitan planning organizations, educational institutions, and private sector organizations were contacted and interviewed for serving on this committee. Approximately 50-60 individuals from the tri-state area were interviewed for this project and for potential participation in the steering committee.

The New York Metropolitan Transportation Council (NYMTC) staffs a tri-state committee called the Metropolitan Mobility Network that advises on similar projects. Two meetings were conducted with this group to assess level of interest and to request participation at the steering committee level. Staff from NYMTC was instrumental in setting up meetings with the Metropolitan Mobility Network and additionally in helping conduct meetings of the greater New York steering committee.

A list of steering committee members can be found in Appendix 5.

Methodology

Once the steering committee was formed, three formal meetings were conducted with the members. These meetings were held in New York City at the World Trade Center and audioconferencing capabilities were provided for those who could not attend in person. Approximately 15-20 participants attended each meetings in person or by audio. The main objectives of the meetings were to identify barriers to and enablers of teleworking, and to develop potential policies that could help accelerate the adoption of teleworking. A PowerPoint presentation was developed for each session. These presentations are available in Appendices 4 through 7. The meeting time was used to encourage dialogue among committee members. Each meeting lasted about two hours.

The first and second meetings were primarily used to identify and prioritize lists of barriers, enablers, and policy recommendations. Barriers were defined as "restraining forces which impede widespread adoption of telework programs." Teleworking enablers were also identified; enablers were defined as "forces that drive us toward the goal of increased telecommuting." Policy recommendations were defined as guidelines for policies that could help increase the adoption of teleworking in the region. There was active participation from all members of the steering committee. Meetings were used to discuss and debate ideas, as well as to develop consensus among the varying parties. The third meeting was used to develop details on policy recommendations and to identify components such as funding and administration of tasks. To prioritize the barriers and

policies, members voted by placing one to three of ten dots on each particular item. Those in attendance voted in person and those attending by audio also voted by phone.

Findings

Definition of Telework

At the outset of meetings, the steering committee elected to define telework. Per the committee, telework:

- Extends the workplace beyond the traditional office.
- Is typically a voluntary arrangement and not an entitlement.
- Replaces a commute trip.
- Can be part-time (1-3 days per week) or full time (4-5 days per week).
- Does not apply to home-based businesses or sales oriented occupations.

This definition was developed as a starting point for the discussion and teleworking was deliberately phrased "as replacing any commute trip," as opposed to just an auto-oriented trip. It also precluded home-based businesses.

Barriers to Telework

For the first two meetings, the steering committee developed a list of barriers and enablers to teleworking. The barriers were clustered into the categories of corporate, technological and legal, marketplace/institutional, and individual.

Corporate

- Lack of management leadership
- Lack of institutional adoption – (formal vs. informal programs, reluctance to formally adopt programs)
- Poorly managed programs - not managed by objectives
- Viewed as entitlement - "Haves" vs. "Have-Nots"
- Lack of Guidelines
- Limited cost-benefit analyses performed to date (technology vs. increased productivity)
- Lack of corporate buy-in
- Lack of corporate incentives
- Difficulty in reengineering office tools (software/paper systems) to be reachable from remote locations

Technological and Legal

- Physical space constraints - e.g., workers do not have space at home
- Companies must deal with multiple telecommunications service providers and lack of control over vendors supplying technology (data/voice)
- Possible need to equip employees at two locations
- Low awareness of workers compensation, liability, OSHA issues
- Securing union buy-in

Marketplace/Institutional

- Lack of resources available to companies in planning stages
- Lack of access to guidelines for implementation
- Lack of publicly available success stories and testimonials
- Lack of government leadership and coordination (local/county, state/region)

Individual ("Perceived")

- Teleworkers might fear lack of connection and visibility
- Need for face-to-face meetings and communications
- Inability to measure productivity at home

Upon completing the list of barriers, each participant was provided with ten colored dots, which they were asked to distribute to those barriers they deemed to be most critical. They were asked not to allocate more than three dots to any one barrier. After the meeting, some of the barriers were combined in similar categories to arrive at the three most significant barriers. The following table shows the main three categories of barriers as identified by the steering committee.

Total: Buy-in / Management Leadership	**43.6%**
- Lack of management leadership	56.9%
- Lack of corporate buy-in	41.2%
- Viewed as entitlement – "Haves" vs. "Have-Nots"	15.7%
- Poorly managed programs – not managed by objectives	13.7%
- Lack of institutional adoption – formal vs. informal programs, reluctance to formally adopt programs	5.9%
- Securing union buy-in	5.9%
- Reengineering office tools (software/paper systems) to be reachable from remote locations	3.9%
- Possible need to equip employees at two locations	3.9%
Total: Guidelines / Available Data	**43.0%**
- Lack of resources available to companies in planning stages	23.5%
- Lack of publicly available success stories and testimonials	23.5%
- Lack of guidelines	23.5%
- Limited cost-benefit analyses performed to date (technology vs. increased productivity)	23.5%
- Low awareness of workers compensation, liability, and OSHA issues	15.7%
- Teleworkers might fear lack of connection and visibility	11.8%
- Lack of access to guidelines for implementation	11.8%
- Inability to measure productivity at home	9.8%
- Need for face-to-face meetings and communications.	2.0%

Total: Government Leadership	**13.4%**
- Lack of government leadership and coordination (local/county, state/region)	21.6%
- Lack of corporate incentives	19.6%
- Companies must deal with multiple telecommunications service providers	2.0%
- Lack of control over vendors supplying technology (data/voice)	2.0%

It was no surprise that lack of management leadership and buy-in rose to the top of the list of barriers. Management commitment is critical for starting and expanding programs. Typically, buy-in needs to occur at both the mid and upper levels of management before a program becomes successful. This lack of buy-in is often tied to lack of knowledge on teleworking effectiveness as well as of the components of program implementation, which was the second barrier identified by the group. There is a wealth of information on teleworking created in the past 20 years that can help support bottom-line benefits of such programs. Additionally, there are solid implementation steps such as developing policies and selection criteria, and offering training that helps overcome many of management's fears regarding programs. Last, the participants identified lack of government leadership in offering incentives or starting their own internal programs as a barrier to greater adoption of teleworking.

Enablers to Telework

After outlining barriers to telecommuting, the steering committee discussed enablers, or "forces," that increase telecommuting. Fewer categories were used and generally the enablers were used to segue into policy development. The following were the key enablers identified by the group:

Corporate and Individual

- Real estate savings through hoteling, office sharing, and reduction in parking expense
- Increased productivity
- Employee cost reductions
    - Meals
    - Transportation/Fuel

Technological and Legal

- Improved connectivity
- Increased computer literacy
- Ease and reduced cost of obtaining computer equipment
    - Docking stations and lap tops
- Existing and Proposed Legislation
    - Pilot Programs
    - Tax Credits

Policy Development

After categorizing barriers and enablers, the steering committee came up with a list of potential policies, which would both leverage the enablers and help to mitigate barriers. Potential policies were also identified by category, as follows.

Marketplace

- Promote telework as a work/life benefit, while ensuring adequate measurement of cost and efficiency benefits as well as VMT.
- Establish program to train and educate key players in benefits of telecommuting.
- Establish national/Federal telecommuting resources that can be accessed within the region.
- Government-led programs (mandate government agency involvement).
- Create regional network or steering committee to address issues.
- Provide proposals for zoning legislation.
- Examine feasibility of establishing telework centers (work locations).
- Dedicate funding and grants for implementation of programs.
- Include telework in regional planning and goals for conformity budgets (as a separate line item).

Corporate and Technological

- Design "Model" Program
  - Goals and Goal Setting
  - Establish standards for programs, job types, metrics, and baseline data
  - Risk management standards
  - Ergonomic and home office space standards
  - Cost/Benefit Model and Analysis
  - Technology and Security Issues
- Create connections between ozone action days and impact of teleworking.
- Find means to reward organizations for involvement.
- Work with unions to define telecommuting as a union benefit.
- Establish a consortium of telecommunications providers.
- Establish a main group or agency that would subcontract to a variety of telecommunications providers.

Miscellaneous/Other

- Integrate telecommuting with regional data collection efforts; generate local case studies.
- Create agency buy-in through institutional and political champions.
- Establish strategic alliances.
- Find private sector champions.
- Develop public awareness campaign that emphasizes bottom line benefits.
- Provide outreach to municipalities.
- Explore market-based and general incentive programs for teleworking (emissions trading and tax incentives).
- Involve major office supplier to establish furniture and home office standards.

The steering committee members were provided with ten dots to vote on preferred policy recommendations. Again, they were asked not to allocate more than three dots to any one policy. After the meeting, several of the policy topics were combined to create specific policy categories. The results of the voting and identification of four key policy categories was as follows:

Policy	Votes	Percent
Develop a model program; provide one-on-one assistance to companies	67	43.8%
Public awareness campaign / Educate companies on work/life and other benefits of telecommuting	50	32.7%
Create Dedicated Sources of Funding	18	11.8%
Create market-based tax incentives	18	11.8%

Each of these policy recommendations combines several of the more than twenty recommendations identified by the steering committee. Chapter 9 provides a more detailed iteration of each policy recommendation.

Chapter Nine: Recommendations

Based on meetings with the Greater New York telework steering committee and review of the findings of this study, several actions can be undertaken to increase the adoption of telework in the region. Government assistance can create the impetus for the implementation of several of these actions and programs. A partnership, however, among Federal, state, regional, and local agencies is critical to the success of these programs.

It is recommended that the first three policies be viewed as a package. They are interrelated and need to be viewed as three components of the same program.

The recommendations are as follows:

A Model Program

A Model Program would serve as a one-stop resource for information, materials, expert advice and hands-on assistance for developing/expanding telework programs tailored specifically to a company and its employees. Similar efforts are already underway in the D.C., Houston, Denver, Phoenix areas, and in Connecticut, whereby employers can easily gain access to information and assistance on teleworking. These programs have been extremely successful in getting teleworking programs implemented and have been administered by a variety of agencies and partnerships including the metropolitan planning agencies, the state or local government, and other regional government agencies.

This program can offer a comprehensive package of technical assistance services, including:

- One-on-one consultation with telework experts,
- Presentations on teleworking designed for upper and middle management,
- Design and implementation of telework programs,
- Identification and selection of telework candidates,
- Development of telework policies, procedures, and agreements,
- Marketing of telework to upper and middle management,
- Sample materials, case studies, and implementation kits,
- Program evaluation guidelines and strategies,
- Training sessions for managers and teleworkers, and
- Website with all necessary tools for implementing teleworking.

The basic objectives of this program would be to provide guidelines, information, and assistance on developing a telework program. The main incentive of such a program is the free assistance that is offered to employers in program design and implementation. Such a program offers sample policies, implementation materials, and training curriculums available as templates with assistance offered to employers for program implementation. There would be economies of scale in providing the basics for program

implementation through templates that could be further tailored by employers and/or with assistance at the one-on-one level. It would be most important to introduce such a program as "voluntary and not as mandated."

A website including the sample program templates, case studies, training materials, and relevant research presents a good tool for marketing the materials and resources on the program. In addition to including information on telework research and implementation materials, this site could also include information for local and regional government on examples of the use of teleworking in developing state implementation and transportation conformity plans. This would help policy makers with tools for meeting air quality and transportation requirements. Examples could be included of how teleworking has been incorporated in existing planning documents.

As part of developing this model program, it is recommended that that government agencies lead by example through implementing programs for their agencies and through creating political champions in the region.

Public Awareness

In conjunction with development of a Model Program, which provides tools and resources for program implementation, a public awareness campaign would need to be developed to educate decision-makers on the benefits of teleworking. These benefits would be positioned from a bottom-line perspective, emphasizing the work/life benefits of teleworking. There are numerous success stories on teleworking, which can be publicized and made widely available. Many of those success stories are already included in this report (Appendix 4). Components of such a campaign could include:

- Publicizing case studies/success stories on teleworking,
- Placing news articles and TV spots,
- Promoting teleworking through political champions,
- Collecting improved information on teleworking in the region,
- Providing cost-benefit information on teleworking to employers,
- Conducting press events on teleworking, and
- Working with the vendor and telecommunications communities to develop discount programs for teleworkers.

Most of the regions with existing telework assistance programs have experienced a surge in activity after placing articles in local media. "Telling the success of teleworking," through news stories, has proven to be far more valuable than advertising. A public awareness campaign with good data and examples on teleworking could help pave the way for increased interest in teleworking. A Model Program could then provide one-on-one assistance and tools for transforming that "interest" into actual implementation.

Dedicated Sources of Funding

It is recommended that either a dedicated source of funding be created or existing funds be targeted for a Model Program and for the public awareness campaign. Funding sources exist at the Federal, state, regional and local levels. Telework programs nationwide have been created tapping into various sources of existing funding. Some states have successfully used CMAQ funding to create a Model Program. In some regions, local funds were used to start programs. The Greater New York steering committee, however, felt that given the competitive nature of funding at the state, regional, and local levels "other than in Connecticut, teleworking would never make the list of state and regional programs." They thought that a "dedicated funding source" would need to be created to start a Model Program. The funding would be used to create a telework resource center or "model program resources" at the regional/local level.

Market-Based and Tax Incentives

The steering committee thought that market-based and tax incentive programs could help accelerate the adoption of teleworking in the region. It seemed, however, that creation of an infrastructure related to the promotion and one-on-one assistance for implementation of programs was a precursor to implementing this tier of policies. Appendix 10 presents hypothetical scenarios for the adoption of a trading scheme related to teleworking. Given current market prices, such a scheme would not be viewed as highly profitable to employers.

Tax incentives and emissions trading programs might be viable strategies in the future. The steering committee felt that adoption of such programs at this point was premature.

Summary

It is recommended that a Model Program be developed. The three proposed policies of developing a Model Program, raising public awareness, and creating dedicated sources of funding are interrelated. The dedicated sources of funding would support the development of a model program, and a public awareness campaign. At the same time, without support for a public awareness campaign, or a viable model program, it could be difficult to create a dedicated funding source. Thus, the committee determined that the first three policy recommendations were interrelated and should be presented as a package.

It is recommended that a dedicated funding source be targeted at supporting telecommuting through Model Program design and public awareness campaigns. These efforts could be strengthened in the future through exploring market-based and tax incentives.

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Appendix

106TH CONGRESS
2d Session
HOUSE OF REPRESENTATIVES
REPORT
106–940

MAKING APPROPRIATIONS FOR THE DEPARTMENT OF TRANSPORTATION AND RELATED AGENCIES FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 2001, AND FOR OTHER PURPOSES

OCTOBER 5, 2000.—Ordered to be printed

Mr. WOLF, from the committee of conference, submitted the following

CONFERENCE REPORT

[To accompany H.R. 4475]

The committee of conference on the disagreeing votes of the two Houses on the amendment of the Senate to the bill (H.R. 4475) "making appropriations for the Department of Transportation and related agencies for the fiscal year ending September 30, 2001, and for other purposes", having met, after full and free conference, have agreed to recommend and do recommend to their respective Houses as follows:

That the House recede from its disagreement to the amendment of the Senate, and agree to the same with an amendment, as follows:

In lieu of the matter stricken and inserted by said amendment, insert: *That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of Transportation and related agencies for the fiscal year ending September 30, 2001, and for other purposes, namely:*

Section 101. (a) The provisions of the following bill are hereby enacted into law, H.R. 5394 of the 106th Congress, as introduced on October 5, 2000.

(b) In publishing the Act in slip form and in the United States Statutes at Large pursuant to section 112, of title 1, United States Code, the Archivist of the United States shall include after the date of approval at the end an appendix setting forth the text of the bill referred to in subsection (a) of this section.

And the Senate agree to the same.

FRANK R. WOLF,
TOM DELAY,
RALPH REGULA,
HAROLD ROGERS,

67–035

structure investments based on the transportation management plan approved by the Secretary.

Radionavigation and positioning initiatives.—No funding is provided for additional study activities described under "GPS vulnerability study follow-on requirements" and "technical support of GPS spectrum protection and coordination" of the congressional justification as additional funding and guidance is provided for similar initiatives and activities elsewhere in the department. Reprogramming requests in this area will be reviewed if submitted and justified appropriately.

Automotive workforce training.—The conference agreement includes $3,000,000 for development and implementation of a workforce training program designed for specific issues related to the automotive manufacturing industry.

Telework.—The Secretary shall conduct an assessment of the existing practices and infrastructure involved with telework efforts in the greater New York metropolitan area and determine if a telework program, supported by the federal government, could provide significant incentives for increasing the use of telework, thereby reducing vehicle miles traveled and improving air quality. The assessment should identify representatives from local government, environmental organizations and transportation agencies who would comprise a New York City design team for implementing a telework program. Within six months, the Secretary shall report to Congress on the findings of this study. To carry out these activities, the conference agreement includes $300,000.

TRANSPORTATION ADMINISTRATIVE SERVICE CENTER

The conference agreement includes a limitation of $126,887,000 on activities of the transportation administrative service center (TASC) instead of $119,387,000 as proposed by the House and $173,278,000 as proposed by the Senate. The conferees concur in the recommendations of the House to disallow the proposed transfer of the National Oceanic and Atmospheric Administration's Office of Aeronautical Charting and Cartography to the TASC (−$43,963,000) and to disallow proposed new staffing increases (−$461,000). The increase of $7,500,000 above the House-passed level has been provided to accommodate solely the anticipated increased workload stemming from creation of the Federal Motor Carrier Safety Administration.

MINORITY BUSINESS RESOURCE CENTER PROGRAM

The conference agreement includes a limitation on guaranteed loans of $13,775,000, as proposed by the House, instead of a limitation of $13,775,000 on direct loans as proposed by the Senate. Further, the conference agreement provides subsidy and administrative costs totaling $1,900,000, as proposed by both the House and the Senate.

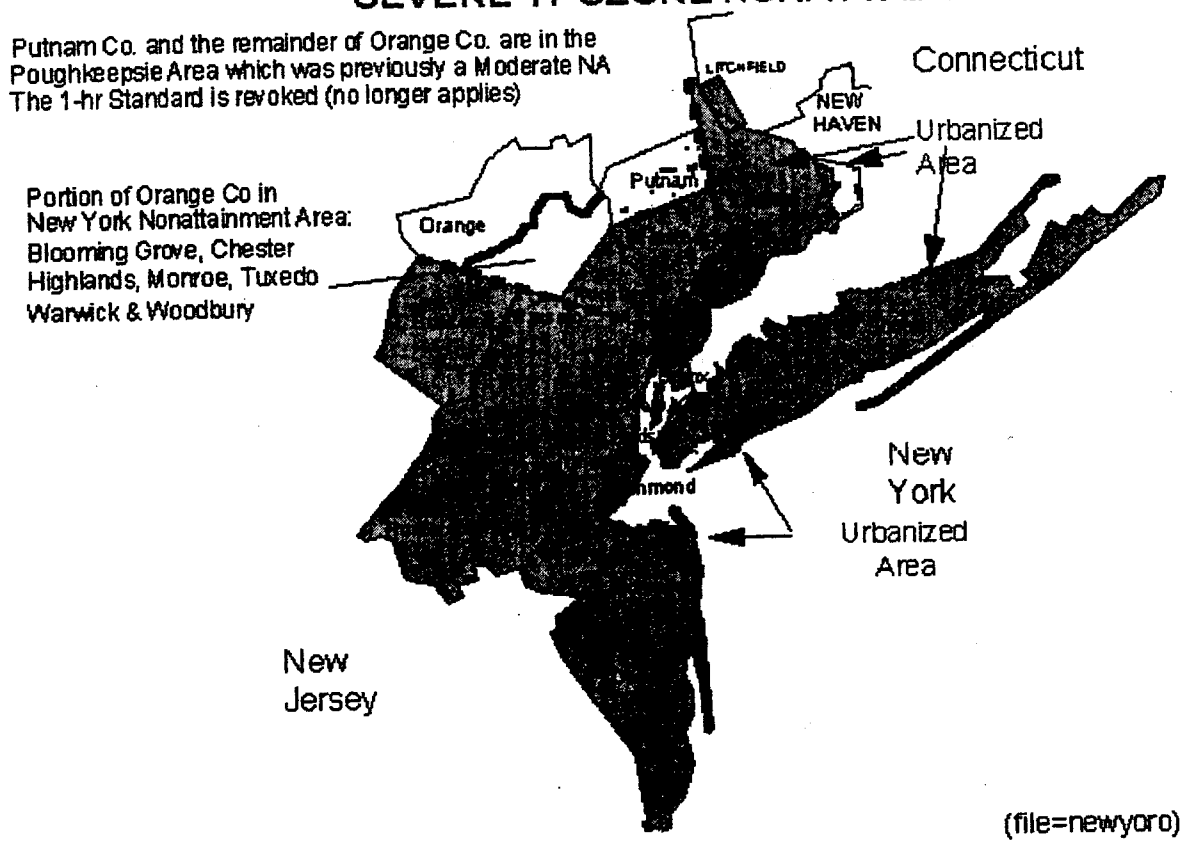
MINORITY BUSINESS OUTREACH

The conference agreement provides $3,000,000 for minority business outreach activities, as proposed by both the House and the Senate.

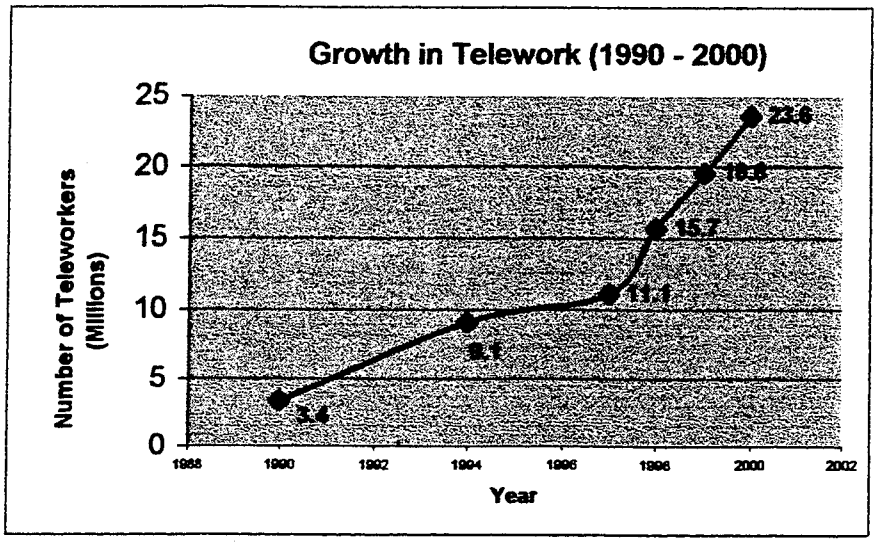
NON-ATTAINMENT AREAS WITHIN THE NEW YORK METROPOLITAN REGION

Connecticut:	Fairfield County
	Part of Litchfield County
New Jersey:	Bergen County
	Essex County
	Hudson County
	Hunterdon County
	Middlesex County
	Monmouth County
	Morris County
	Ocean County
	Passaic County
	Somerset County
	Sussex County
	Union County
New York:	Bronx County
	Kings County
	Nassau County
	New York County
	Queens County
	Richmond County
	Rockland County
	Suffolk County
	Westchester County
	Parts of Orange County

NEW YORK-NORTHERN NEW JERSEY-LONG ISLAND, NY-NJ SEVERE-17 OZONE NONATTAINMENT AREA



Year	Telecomuters		
1990	3.4		
1994	9.1	168%	42%
1997	11.1	22%	7%
1998	15.7	41%	41%
1999	19.6	25%	25%
2000	23.6	20%	20%
		55%	27%
	594%	27%	24%



# Days	Bergen	Passaic	Hudson	Essex	Union	Morris	Somerset	Middlesex	Monmouth	Ocean	Hunterdon	Sussex	TOTALS
0	312,161	141,061	217,490	245,039	171,081	194,056	97,605	234,991	216,971	164,637	41,973	56,731	2,093,796
1	21,144	9,445	7,299	12,704	11,893	10,358	7,860	14,717	21,752	7,199	5,509	4,372	134,253
2	8,601	5,341	5,655	5,591	6,832	9,648	5,374	6,868	7,407	1,959	1,583	2,539	67,400
3	11,115	1,556	3,913	4,505	1,570	4,119	5,203	3,931	5,452	2,594	1,301	468	45,730
4	1,801	1,270	764	3,849	2,254	656	238	1,990	114	1,814	688	532	15,974
5	10,239	1,104	984	3,979	3,548	2,326	2,768	2,291	1,373	3,498	1,257	844	34,216
6	2,608	2,119	1,237	495	317			144	370	677	351	291	8,615
7	3,887	2,915	2,368	6,763		4,152	1,041	4,724	4,890	2,792	591	350	34,480
Population	371,556	164,811	239,710	282,925	197,495	225,315	120,089	269,656	258,329	185,170	53,253	66,127	2,434,464
Total Tcers (TC >= 1)	59,395	29,750	22,220	37,885	28,414	31,259	22,484	34,668	41,358	20,533	11,280	9,396	340,668
TC >=2	38,251	14,305	14,921	25,182	14,521	20,901	14,624	19,948	19,606	13,334	5,771	5,024	206,415
TC >=3	29,650	8,964	9,266	19,591	7,689	11,253	9,250	13,080	12,199	11,375	4,188	2,485	139,015
TC>=4	18,535	7,408	5,353	15,086	6,119	7,134	4,047	9,149	6,747	8,781	2,887	2,017	93,285
TC >=5	16,734	6,138	4,589	11,237	3,865	6,478	3,809	7,159	6,633	6,967	2,199	1,485	77,311
% Tcers (>= 1)	15.99%	14.41%	9.27%	13.39%	13.37%	13.87%	18.72%	12.86%	16.01%	11.09%	21.18%	14.21%	13.99%
% >=2	10.29%	8.68%	6.22%	8.90%	7.35%	9.28%	12.18%	7.40%	7.59%	7.20%	10.84%	7.60%	8.48%
% >=3	7.98%	5.44%	3.87%	6.92%	3.89%	4.99%	7.70%	4.85%	4.72%	6.14%	7.86%	3.76%	5.71%
%>=4	4.99%	4.49%	2.23%	5.33%	3.10%	3.17%	3.37%	3.39%	2.61%	4.74%	5.42%	3.05%	3.83%
% >=5	4.50%	3.72%	1.91%	3.97%	1.96%	2.88%	3.17%	2.65%	2.57%	3.76%	4.13%	2.25%	3.18%
TC = 1	35.60%	39.77%	32.85%	33.53%	45.03%	33.14%	34.96%	42.45%	52.59%	35.06%	48.84%	46.53%	39.41%
TC = 2	14.48%	22.49%	25.45%	14.76%	25.87%	30.86%	23.90%	19.81%	17.91%	9.54%	14.03%	27.02%	19.78%
TC = 3	18.71%	6.55%	17.61%	11.89%	5.94%	13.18%	23.14%	11.34%	13.18%	12.63%	11.53%	4.98%	13.42%
TC = 4	3.03%	5.35%	3.44%	10.16%	8.53%	2.10%	1.06%	5.74%	0.28%	8.83%	6.10%	5.66%	4.69%
TC = 5	17.24%	4.65%	4.43%	10.50%	13.43%	7.44%	12.31%	6.61%	3.32%	17.04%	11.14%	8.98%	10.04%
TC = 6	4.39%	8.92%	5.57%	1.31%	1.20%	0.00%	0.00%	0.42%	0.89%	3.30%	3.11%	3.10%	2.53%
TC = 7	6.54%	12.27%	10.66%	17.85%	0.00%	13.28%	4.63%	13.63%	11.82%	13.60%	5.24%	3.72%	10.12%
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
TC 1 to 3	40,860	14,786	12,954	18,295	18,725	20,006	13,234	21,585	29,159	9,158	7,092	6,911	201,653
% 1 or 2	11.00%	8.97%	5.40%	6.47%	9.48%	8.88%	11.02%	8.00%	11.29%	4.95%	13.32%	10.45%	8.28%
% 4 or More	4.99%	4.49%	2.23%	5.33%	3.10%	3.17%	3.37%	3.39%	2.61%	4.74%	5.42%	3.05%	3.83%
% of Total	2%	1%	1%	2%	1%	1%	1%	1%	2%	1%	0%	0%	14%

# Days	Manhattan	Queens	Bronx	Brooklyn	SI	Nassau	Suffolk	Westchester	Rockland	Orange	Total - NYC	Outside NYC	Total - NY
0	566,290	823,419	365,633	756,587	154,110	571,250	608,520	297,821	97,078	109,311	2,666,039	1,683,980	4,350,019
1	52,354	18,921	10,952	26,655	4,100	13,782	19,127	16,165	6,201	5,993	112,982	61,268	174,250
2	27,987	8,448	7,112	16,390	3,099	6,415	15,451	12,172	1,746	864	63,036	36,648	99,684
3	11,285	3,658	4,120	6,632	898	10,292	1,981	4,682	1,737	304	26,593	18,996	45,589
4	12,349	3,007	1,551	1,712	1,062	3,359	6,631	5,033	1,116	675	19,681	16,814	36,495
5	20,752	17,920	3,683	6,718	1,865	3,699	11,854	4,660	847	1,771	50,938	22,831	73,769
6	8,172	2,605	706	5,526	598	3,751	3,912	2,764	1,325	428	17,607	12,180	29,787
7	16,743	2,114		10,306	1,165	3,912	4,590	8,852	2,284	1[illegible]	30,328	19,802	50,130
Population	*715,932*	*880,092*	*393,757*	*830,526*	*166,897*	*616,460*	*672,066*	*352,149*	*112,334*	*119,51[illegible]*	*987,204*	*1,872,519*	*4,859,723*
Total Tcers (>=1)	149,842	86,873	29,124	73,836	12,787	48,210	63,846	54,328	15,259	10,199	321,165	188,539	509,704
TC >=2	97,288	37,752	17,172	47,284	8,687	31,428	44,419	38,163	9,055	4,206	208,183	127,271	335,454
TC >=3	69,301	29,304	10,060	30,894	5,588	25,013	28,968	25,991	7,309	3,342	145,147	90,623	235,770
TC>=4	58,016	25,646	5,940	24,262	4,690	14,721	26,987	21,309	5,572	3,038	118,554	71,627	190,181
TC >=5	45,667	22,639	4,389	22,550	3,628	11,362	20,356	16,276	4,456	2,363	98,873	54,813	153,686
% of Total Population:													
% >= 1	20.90%	6.44%	7.14%	8.90%	7.66%	7.33%	9.46%	15.43%	13.58%	8.53%	10.75%	10.07%	10.49%
% >=2	13.59%	4.29%	4.36%	5.69%	5.21%	5.10%	6.61%	10.84%	8.06%	3.52%	6.97%	6.80%	6.90%
% >=3	9.68%	3.33%	2.55%	3.72%	3.35%	4.06%	4.31%	7.38%	6.51%	2.80%	4.86%	4.84%	4.85%
%>=4	8.10%	2.91%	1.51%	2.92%	2.81%	2.39%	4.02%	6.05%	4.96%	2.54%	3.97%	3.83%	3.91%
% >=5	6.38%	2.57%	1.11%	2.72%	2.17%	1.84%	3.03%	4.62%	3.97%	1.98%	3.31%	2.93%	3.16%
% of Total Telecommuters													
TC = 1	34.99%	33.39%	38.94%	36.05%	32.06%	30.48%	30.10%	29.75%	40.65%	58.76%	35.18%	32.50%	34.19%
TC = 2	18.70%	14.91%	25.29%	22.17%	24.24%	14.19%	24.31%	22.40%	11.44%	8.47%	19.63%	19.44%	19.56%
TC = 3	7.54%	6.45%	14.65%	8.97%	7.02%	22.76%	3.12%	8.62%	11.39%	2.98%	8.28%	10.08%	8.94%
TC = 4	8.25%	5.31%	5.51%	2.32%	8.31%	7.43%	10.43%	9.26%	7.32%	6.62%	6.13%	8.92%	7.16%
TC = 5	13.87%	31.62%	13.10%	9.09%	14.59%	8.18%	18.65%	8.58%	5.55%	17.36%	15.86%	12.11%	14.47%
TC = 6	5.46%	4.60%	2.51%	7.47%	4.68%	8.30%	6.16%	5.09%	8.69%	4.20%	5.48%	6.46%	5.84%
TC = 7	11.19%	3.73%	0.00%	13.94%	9.11%	8.65%	7.22%	16.29%	14.97%	1.61%	9.44%	10.50%	9.84%
TC 1 to 3	91,626	31,027	22,184	49,677	8,097	30,489	36,559	33,019	9,684	7,161	202,611	116,912	319,523
% 1 or 2	61.23%	54.75%	78.88%	67.19%	63.32%	67.44%	57.53%	60.78%	63.48%	70.21%	63.09%	62.01%	62.69%
% 4 or More	38.77%	45.25%	21.12%	32.81%	36.68%	32.56%	42.47%	39.22%	36.52%	29.79%	36.91%	37.99%	37.31%
% of All Tcers	29%	11%	6%	15%	3%	9%	12%	11%	3%	2%	63%	37%	100%

Appendix 3 - Telework Days - New York

	COUNTIES
# Days	Fairfield
0	345,243
1	19,160
2	7,856
3	18,461
4	945
5	12,018
6	2,492
7	1,764
Population	407,939
% TCers	15.37%
TC >= 1	**62,696**
TC >= 2	43,536
TC >= 3	35,680
TC>= 4	17,219
TC >= 5	16,274
% >= 1	15.37%
% >= 2	10.67%
% >= 3	8.75%
%>= 4	4.22%
% >= 5	3.99%
TC = 1	30.56%
TC = 2	12.53%
TC = 3	29.45%
TC = 4	1.51%
TC = 5	19.17%
TC = 6	3.97%
TC = 7	2.81%
TC 1 or 2	27016
% TC 1 or 2	6.62%
% TC 4 or 5	4.22%

CORPORATE TELEWORKING PROGRAMS - NEW YORK

AMERICAN EXPRESS TRAVEL RELATED SERVICES	New York, New Jersey
Employees	▪ 52,000 + company wide ▪ 240+ in Travel Related Services
Teleworkers	▪ 240+
Significant Metrics	▪ Increased productivity (40% more calls per day; 20,000 new establishments signed up) ▪ Customer satisfaction increased by 28% ▪ Employee (rep) satisfaction increased by 25%

American Express Travel Related Services (TRS) is the group that sells establishments the opportunity to accept the American Express card and then services the account. In early 1992, when TRS noticed that the productivity of its field sales force was declining, they performed a study of the field sales process and organization, identifying improvement opportunities. The result was a complete overhaul of operations with process changes leading facilities adjustments. TRS field sales employees spent about 75-80 percent of their time with customers and the balance in TRS satellite offices. The virtual office concept started in 1993, after a careful analysis of the work employees conducted in the satellite sales offices. TRS determined that all of the functions performed in the satellite office could be performed at an employees' home. As a result, TRS mandated the virtual office program. At TRS, the movement from satellite offices to the employees' homes reduced the number of trips each employee was making by about 20-25 percent.

As a result of the move to a virtual office structure, calls per day increased by more than 40 percent, 20,000 new establishments signed up, reps spend four days a week in the field, customer satisfaction ratings increased by 28 percent, and rep satisfaction increased by 25 percent. The improvements are the cumulative result of both process changes as well as the move to virtual offices.

Company-wide, teleworking is promoted to all employees as an alternative work schedule. In addition, at American Express, a teleworking team calls on company offices where leases are up for renewal. If managers are able to reduce space needs by encouraging workers to give up their offices and telework, the savings are shared with the local management team.

AT&T		New York
Employees	▪ 120,000	
Teleworkers	▪ 30,000 + globally	
Significant Metrics	▪ Carbon monoxide - 1.7 million tons ▪ Hydrocarbons - 220,000 tons ▪ NOx - 110,000 tons ▪ Carbon dioxide - 50,000 tons ▪ 110 million miles/year ▪ 5.1 million gallons of gas/year	▪ 95,000 fewer trips/year ▪ 25% increase in productivity (employee reported) ▪ Real estate savings - $25 million ▪ Increased productivity - $100 million ▪ Reduced turnover - $18 million

AT&T, headquartered in New York, introduced telework in the 1980s as part of a corporate citizenship program to reduce air pollution and traffic, and it formally launched a program in 1992 due to increased participation by employees seeking work/life balance. Formalizing the telework program tripled participation rates. AT&T has approximately 20,500 employees in Morris, Essex, and Somerset counties, and an additional 5,300 employees in New York. According to a 2000 AT&T national employee telework survey:

- Fifty-six percent of AT&T managers telework at least one day per month, and 27-28 percent of employees work from home once a week or more
- Approximately 11 percent of managers are virtual office teleworkers
- Twenty-seven percent of managers work from home on an unscheduled basis, compared to only 7 percent claiming to do so just one year earlier; however, the proportion working from home on a scheduled basis declined from 40 percent in 1999 to 25 percent in 2000
- Seventy-seven percent of teleworkers report increased productivity while teleworking, with 7-1/2 hours of productive time in an 8 hour day vs. 6 hours in the office – a 25 percent increase in productivity
- Only 6 percent reported higher productivity during their days in the office as a result of teleworking on other days
- Eighty-three percent of AT&T managers reported higher satisfaction with personal and family lives; 77 percent reported much greater satisfaction with their current career responsibilities
- Sixty-seven percent of teleworkers said that the AT&T telework environment was a major factor in declining other job offers
- Barriers to telework included connectivity (lack of access to broadband), some difficulty locating information, increased isolation, and lack of computer knowledge

AT&T uses a performance management system to track teleworking results and also conducts a yearly statistical random telephone survey, for they feel that self-reporting on

a time and expense sheet is too inaccurate a metric. AT&T estimates that full-time teleworkers per year save the company $25 million in real estate costs, $100 million in increased productivity, and $18 million in reduced turnover. AT&T also estimates that employees drove 110 fewer miles in 1999, saving 5.1 million gallons of gasoline and preventing the emission of 1.7 million tons of carbon monoxide, 220,000 tons of hydrocarbons, 110,000 tons of nitrogen oxides, and 50,000 tons of carbon dioxide.

IBM	New York
Employees	▪ 120,000
Teleworkers	▪ 20,800 + globally ▪ 95% of sales and marketing departments
Significant Metrics	▪ 10 to 20% increase in productivity ▪ 2 million square feet within first two years ▪ 22 million square feet overall ▪ 400,000 square feet in one New Jersey facility ▪ Highest levels of job satisfaction are among teleworkers

IBM, based in Armonk, New York, claims that 26 percent of its 80,000 employees globally telework at least one or two days a week, amounting to approximately 20,800 teleworkers. IBM introduced teleworking in 1993, with the objective of cutting costs by using space sharing arrangements (hoteling). By the end of 1994, IBM allowed its entire U.S. sales force to telework, and within two years it had saved 2 million square feet of office space. IBM claims to have recently eliminated 22 million square feet of office space. In Cranford, New Jersey, there is a hoteling arrangement through which 850 people share 200 desks, saving 400,000 square feet in office space. Employees call in to a central switchboard when they arrive and are assigned to a cubicle, where the phone may be programmed to their individual phone lines. A survey conducted in 1996 indicated that teleworking employees showed the greatest job satisfaction and anticipated staying with the company the longest. The majority of teleworkers were "more" to "far more" productive as a result of teleworking. Personal productivity increased to between 10 and 20 percent after teleworking was implemented. This was especially impressive as a productivity increase of only .1 percent was enough to make the program cost effective.

DELOITTE & TOUCHE	New York, New Jersey
Employees	▪ 30,000 throughout U.S.
Teleworkers	▪ 800+ using flexible work arrangements
Significant Metrics (of FWAs)	▪ 80% of employees might have left the firm without a flexible work arrangement ▪ Highest reported levels of employee satisfaction

Deloitte & Touche has a number of flexible work arrangements in place, one of which is teleworking. The main objective for Deloitte's implementation of these arrangements has been employee retention. Professionals telework regularly; 80 percent of employees who

responded to a survey last year said they would have left the firm without a flexible work arrangement. In the New York tri-state area, the firm will pay to set up an employee's home office, from furnishings to computer. Deloitte has been recognized by Working Woman magazine as one of the "100 Best Companies for Working Mothers" and by Fortune Magazine for the past four years as one of the top 100 companies to work for in the United States.

NEW YORK TIMES — New York

Employees	▪ 15,050
Teleworkers	▪ 5% of employees
Significant Metrics	▪ No known metrics

In a 1997 survey at the New York Times, employees cited a need for greater flexibility. As a result, a work/life manager position was created to identify work/life balance related programs and a telework program was set up and in 1999. Six percent of employees surveyed reported working a reduced schedule, 15 percent use flextime, 5 percent telework, and 10 percent have a compressed workweek. To enable employees and their families to access the Internet, the company arranges leased computers for employees at a reduced rate.

DEUTSCHE BANK — New York

Employees	▪ "An impressive number"
Teleworkers	▪ Exact number is unknown, but per a recent survey, the number is "impressive" ▪ There has been a recent increase in demand from employees traveling 1.5 to 2 hours/day to work
Significant Metrics	▪ No metrics at this time

Deutsche Bank has had a flexible work arrangement benefit for several years, which includes teleworking guidelines. Corporate HR believes that groups and businesses can work out teleworking arrangements, and acts as an advisor or liaison to the smaller business units. The teleworking schedule is contingent upon the HR advisor working with the manager and working with the candidate. HR believes most managers are amenable to permitting teleworking to employees who are good workers.

Teleworking candidates must submit a proposal to their managers, who must also complete a worksheet. The worksheets are considered critical for evaluation and set-up, and identify benefits, challenges, and obstacles to teleworking. The worksheets help assess whether both the business and the candidate are suitable for teleworking. Qualifications for the program are performance and business need related, and also based on impact on other colleagues. An employee's ability to telework also depends on infrastructure support from the technical side. If the employee is not set up at home appropriately with a quick enough system, teleworking will not be feasible for that employee. After approval, there is an initial trial period with ongoing evaluation and

renegotiation of subsequent agreements. An employee can also be hired into a teleworking arrangement if it is suitable for the business in question.

There is no current data on the numbers of teleworkers, though Deutsche Bank intends to conduct surveys and tracking prior to the end of 2001. However, an informal survey of HR advisors found an "impressive" number of teleworkers. There has also recently been an increase in demand for teleworking from employees who travel 1.5 to 2 hours a day to work. Many managers telework informally on a day-to-day basis.

MERRILL LYNCH

New York

Employees	▪ 70,700 nationally
Teleworkers	▪ About 5% (3,500 +)
Significant Metrics	▪ 15% increase in productivity ▪ 30% increase in employee morale ▪ 3.5 days sick day reduction ▪ Retention/absenteeism savings of $10,000 per teleworker ▪ Reduction of about 95,000 trips/year ▪ Reduced turnover and expanded recruitment opportunities noted

Merrill Lynch launched a teleworking pilot of 36 employees in 1996 as a result of the Clean Air Act of 1990, as well as a 1995 employee survey, which showed an interest in teleworking. Merrill Lynch also hoped to address turnover and enhance its ability to attract top people with Internet skills by offering a teleworking benefit. The initial pilot was implemented in a group of about 2,100 employees. Telework became the corporate standard in 2000 and today about 5 percent of the company's 70,700 employees (3,500) work from home two or three days a week.

Employees who wish to telework must submit a written proposal to their supervisors outlining the personal and professional attributes that would ensure success. Managers lay out success factors for the worker and identify any concerns. Employee and manager then go through training geared to making the long distance relationship successful. Teleworking employees are also required to attend training in a simulation lab for six days over a two-week period, usually on their scheduled telework days. As part of training in the lab, they learn how to connect to Merrill Lynch's servers, access network drives, synchronize and transfer files, and perform daily backups. They are also taught how to disassemble and reassemble their PCs, so they can troubleshoot minor technical problems while at home. A dedicated staff of IT professionals supports remote workers, with five technicians on call during regular business hours. Ongoing technical support is provided through a help line and an e-mail support mailbox.

Teleworkers are required to have office space at home, whether a dedicated room or clearly defined section of a room. Merrill owns, insures, and maintains all of the equipment supplied to teleworkers, including furniture and two analog phone lines for voice and data. Merrill tries to ensure that ergonomic office standards are extended to the home; teleworker training includes recommended heights for desks, lighting, chairs, etc.

Upon commencement of a teleworking arrangement, employees are required to submit five photographs of their workspace, including their monitor, desktop, chair, and a photo of the employee sitting in the chair.

Cable is the first broadband choice for network access wherever it's available. Most employees use analog lines with about 25 percent of teleworkers converting over to cable. As of May 2001, there were plans to explore using DSL in the second half of 2001. Servers have been upgraded to provide 56K capability 24/7 for a fixed price point. Unlimited cable access costs about $50-90 per month. The company estimated savings of over $60,000 during a pilot with just 18 people using cable access.

PRICEWATERHOUSECOOPERS

New York, New Jersey, Connecticut

Employees	▪ Number not known
Teleworkers	▪ 110 in New York Metro area ▪ 700 nationally
Significant Metrics	▪ Improved recruitment and retention ▪ More effective use of office space ▪ Improved employee morale and job satisfaction ▪ More effective use of time

PricewaterhouseCoopers ("PwC") has a formal teleworking program for employees working at home three to five days a week. About 700 teleworkers are formally under the program, with 110 in New York City, New Jersey, Long Island, and Connecticut. PwC provides employees with a teleworking manual and additionally provides guidance for those people who wish to work at home routinely for less than three days each week.

PwC's teleworking guidelines provide job characteristics suitable for work at home, as well as traits of successful teleworkers. It outlines eligibility, the transition period, and procedures, as well as home office set up.

In order for an employee to be considered, there is an application process, which includes self-assessment, department approval, and partner sign-off. PwC assists with home office setup as needed, e.g., hardware installation or connectivity. Guidelines are extensive and include recommendations related to work, communications, expenses, safety, liability and insurance, and etc. Each teleworker is allocated to an office location.

PwC believes it benefits from improved recruitment and retention, more effective use of office space, increased productivity, improved disaster recovery options, and active support of Federal requirements such as the Clean Air Act and Americans with Disabilities Act. PwC believes staff members benefit from enhanced morale and increased job satisfaction, reduced stress and expenses associated with commuting, more flexibility in managing work and personal responsibilities, and more effective use of time. They believe society benefits from energy conservation, safer and less congested highways, safer and more active neighborhoods, and an improved environment.

VYTRA HEALTH PLANS

Long Island, New York

Employees	▪ 450
Teleworkers	▪ 50
Significant Metrics	▪ Reduction of 8,308 trips in 1999 ▪ Increase in productivity; claims processed by teleworkers increased from 18% in 2/99 to 34% in 10/99

In 1999, with a grant from the New York Department of Transportation, Vytra Health Plans implemented a teleworking pilot program. In 1998, when the Health Plan was faced with a loss of qualified claims personnel, it began a telecommuting pilot program to attract back those employees who had left the company due to childcare issues. At the outset, the pilot commenced with seven former employees. Today, the number of telecommuters may be as high as 50. Included among the telecommuters are analysts, a quality auditor, and team leader. Teleworking employees reside in Long Island and Pennsylvania. One of the unique features of the program is that most employees work from home full-time, with only about six employees working at home one or two days per week. Claims teleworkers account for approximately 1/3 of all daily claims production.

To address management issues such as communication, periodic meetings are arranged with those claims processors who work at home on a full-time basis. These are arranged at times which are mutually convenient for the teleworkers and the team leads. Team leads are equipped with a cell phone, voicemail box, and answering machines for work numbers at home. Teleworkers are "buddied" with on-site employees for help with needs such as retrieving claim images more than six months old. Finally, the company has revised productivity standards for home processors and has liberalized the schedule allowing teleworkers to meet their production number over seven days, rather than five, which provides greater flexibility with respect to work schedules.

To facilitate a smooth transition to telework, the company has put together a telecommuting manual with criteria for selection, individual attributes needed, and other helpful hints. It specifies that teleworking employees must be self disciplined, organized, and committed to a personal schedule.

When the program was initially implemented, a variety of PCs, modems, and phone lines were tested to optimize access and productivity. The optimal configuration in use today involves a standard telephone line and a modem. Employees can access the system 17 hours per day, on site or at home.

NABISCO

New Jersey

Employees	▪ 50,000
Teleworkers	▪ less than 100
Significant Metrics	▪ No available information

Nabisco Refrigerated Foods Company in Parsippany, New Jersey implemented a teleworking pilot in 1994. The goal was to find a way to maximize resources by saving on real estate costs if employees worked from home. Five out of 18 employees in the finance department worked at home an average of two and a half days a week. By scheduling their time in the office on opposite days, the teleworking employees were able to share office space. A "teleworking bull pen" allows for people to share the space normally reserved for one.

Today, Nabisco handles teleworking on a case-by-case basis. There is a request and approval process, which is fairly informal. An employee submits a request to his or her supervisor, who approves the request if the employee has a job that is suited for working at home. Generally, a request should be approved, unless there is a good reason not to approve it. Nabisco considers teleworking as effective as working in the office, although it has not caught on widely at the company. Less than 100 employees out of 50,000 telework on a regular basis.

DUNN & BRADSTREET

New Jersey

Employees	▪ 10,000 worldwide, 300 in NJ
Teleworkers	▪ Number not known
Significant Metrics	▪ Real estate cost savings of 20-25%

Dunn and Bradstreet has approximately 10,000 employees worldwide, with about 300 software developers at its Parsippany, New Jersey office. In 1994, D&B launched a teleworking pilot with the objective of reducing office space. The company provides ISDN lines to facilitate the teleworkers. Senior employees are eligible for the program, while trainees are not. Employees must prove that it is the best interest of the company for them to work at home. Performance is monitored regularly. As a result of implementing teleworking, Dunn and Bradstreet projected real estate cost savings of 20-25 percent. Michael Bell of Dunn & Bradstreet is quoted as stating in *Facilities Design and Management* in October 1993, that Dunn & Bradstreet's "program of shared office space and teleworking" cuts real estate costs "in half."

VERIZON

New York, New Jersey

Employees	▪ 260,000+; 1100 locations nationwide
Teleworkers	▪ Number not known
Significant Metrics	▪ Unknown at this time

Verizon, a leading provider of teleworking and virtual office solutions, has a loosely administered telework policy. While there is very little data about teleworking at Verizon, it should be noted that Verizon offers a comprehensive package of Virtual Office Solutions to corporate clients with teleworking employees. Verizon's solutions provide employees with Internet access and/or secure remote access to the corporate network, using a Managed Virtual Private Network (VPN). Virtual Office equips the home office with communications capabilities that replicate the corporate office, including applications such as Caller ID, conferencing, and voice mail. Connections include analog, ICN, or DSL. Customers may choose the technology tailored to meet their needs. Verizon consults with its customers on such issues as ordering procedures, authorization policies, and service selection criteria. In addition, Verizon builds secure web pages, builds databases to track information submitted via the web page, and facilitates report generation. Once systems are installed and Verizon has ensured that everything functions properly, Verizon provides a help desk for users with technical problems. Verizon offers consulting services to help clients define teleworking goals, develop the business case, select and train employees and managers, and ensure environmental compliance.

JOHNSON & JOHNSON

New York, New Jersey

Employees	▪ 120,000
Teleworkers	▪ A "significant number"
Significant Metrics	▪ 80% of managers are equipped with laptops to telework on as-needed basis

In the early 1990's, Johnson & Johnson participated in the Employee Trip Reduction Program mandated by the Clean Air Act in New Jersey. At that time, a teleworking program was already in place as one of several "family friendly" benefits offered by the company, along with childcare centers, flex time, and shortened workdays. For many years, sales representatives have done most of their work from their homes and from their cars, only visiting the main office about one day per month to see their bosses. Non-sales employees may telework from their homes or an affiliate location, based on the nature of work they do; it is handled on a case-by-case basis. Some employees telework two or three times a week. All employees are provided with "objectives/goals," which they must reach regardless of where they work. If a teleworking employee does not meet the objectives, he or she could lose the right to telework. Approximately 80 percent of managers at the company are equipped with laptops, so that they may work at home on an as-needed basis. While there is no data available on total number of teleworkers, company spokesperson Steve Chupa indicated that the number is significant throughout the 11 or 12 locations throughout central New Jersey.

TELCORDIA TECHNOLOGIES — New Jersey

Employees	▪ 5,000 in New Jersey
Teleworkers	▪ 1100+ in New Jersey
Significant Metrics	▪ 20% increase in productivity ▪ Improved morale

Telcordia Technologies, a software developer, has about 7,000 employees throughout the world, with approximately 5,000 in New Jersey and 250 in Illinois. Telcordia has been actively using teleworking since 1993, when they launched their program as part of the PA's Clear Air Act employee trip reduction efforts. That launch helped to implement a program, which had already existed on a much smaller basis. Teleworking turned out to be the most successful part of an overall trip reduction program, which also included compressed workweeks, biking to work, etc. The program received strong senior management support and publicity. Today, teleworking is included as part of new employee orientation. In addition, there is an employee manual on Telcordia's website, which describes how to set up equipment. Many employees might start teleworking after only a couple months with the company.

Telcordia recently conducted a survey of employees who telework regularly, to which about 1,500 employees responded, primarily with positive feedback. Teleworking has shown about a 20 percent across-the-board improvement in productivity and is considered a major company benefit. Telcordia has been able to implement the program because it improves morale, productivity, and the environment, which translates to attaining and attracting employees. Approximately 20 percent of employees (about 1,100 in New Jersey and 1,500 globally) telework on a regular scheduled basis – one to five days per week every week. Additional employees telework on an *ad hoc* basis.

AVAYA — New York, New Jersey

Employees	▪ Number not known
Teleworkers	▪ 4,500
Significant Metrics	▪ Unknown

Avaya Communications is the former Enterprise Networks Group of Lucent Technologies, which has been in business for over 130 years. Nationally, about 4,500 employees of Avaya telework. Those employees share office space with another teleworker, resulting in a reduction in real estate expense. In addition, another 2,500 employees are fully virtual. An employee's ability to telework is based on job function and real estate. Teleworkers receive no formal training. In addition to teleworking, Avaya also offers flexible work schedules, which include part-time, job-shares, and compressed workweeks.

SCHERING-PLOUGH

New Jersey

Employees	▪ 16,000 U.S.; 22,000 total
Teleworkers	▪ 120
Significant Metrics	▪ Productivity gains - $390,000 ▪ Increased effectiveness - $312,000 ▪ Reduced sick time - $121,000 ▪ Reduction in turnover - $1 million ▪ Overhead savings – 60 offices ▪ Avoidance in travel costs - $2.3 million ▪ Real estate avoidance - $840,000 in space for teleworking staff ▪ Leasing costs avoidances for space to support field staff work - $430,000 for space to support field staff work ▪ Turnover cost savings - $675,000

Schering-Plough Research Institute, located in Kenilworth, New Jersey and a division of Schering-Plough Corporation, has a teleworking program in place entitled "Smartwork." The program is a combined effort from various internal functions including Training, RIS, Engineering, Facilities, HR, and Management. The company has about 120 active teleworkers with a reported 98 percent satisfaction rate for teleworkers and 96 percent satisfaction for managers based on recent user surveys. Groups that are involved in teleworking including Clinical Research and Clinical Operations, as well as Regulatory Affairs, Human Resources, Research Finance, Research Information Systems, and Drug Safety & Metabolism.

To support the teleworking program, the company provides formal training programs to teleworkers and their managers, related to doing work remotely, managing the remote relationship, and Schering-Plough Research Institute's culture and processes (i.e., how work gets done).

A number of technology solutions are in place to allow seamless remote work, including the addition of a variety of applications to the dial-up network environment, which extends remote work to a wider range of job types. PCAnywhere is used so that tech support may "see" what a user sees on the screen in real time to help identify and resolve problems. Schering-Plough also uses IP Insight, a dial-up monitoring tool that allows the technical team to track problems with the dial-up process, including date and time, nature of error, number of attempts, dial-up number called, etc. There is also a Remote Access Support Center, which is focused on technical support of remote workers.

Communication with teleworkers includes voicemail distribution lists, weekly conference calls, regular one-on-one meetings to discuss performance, monthly feedback sessions, and a Smartwork website. Schering-Plough provides ISDN lines to its teleworkers, as they believe teleworkers have better privacy through ISDN than through broadband (i.e., DSL or cable), although this year the company is looking into the possibility of adding broadband connectivity where available. The company is looking into additional technology improvements including scanner capability, electronic document management capabilities, and desktop videoconferencing.

GEORGIA PACIFIC COMPANY (FORT JAMES CORPORATION)

New York, New Jersey

Employees	▪ Number not known
Teleworkers	▪ 20+ in one department ▪ Company-wide number unknown
Significant Metrics	▪ Increased productivity (project related work) ▪ Decreased absenteeism (0 for participants) ▪ Possible annual savings (in Corporate Credit Department) of a $26,000 due to reduced employee turnover and associated costs.

Fort James Corporation, recently acquired by Georgia Pacific Company, implemented a teleworking pilot program in its Corporate Credit department in December 1999. The pilot was used to test and measure the benefits of teleworking, in order to roll it out on a large scale basis throughout the company. There was no formal telework policy in place at that time. Inspiration for the pilot came out of a larger initiative called "Mobile Office," which was designed to facilitate a largely mobile workforce and ensure that frequent travelers could access any files or data when they were on the road. Technology was upgraded as part of that initiative, including faxing software and scanning technology. Standards were created related to electronic calendaring, scheduling, and other processes, and the whole group was trained on those standards. Telephones were call forwarded to employees working at home so that teleworking would be transparent to customers.

The Corporate Credit department outlined teleworking guidelines, which teleworking employees are responsible for reading and understanding. Teleworkers must complete and sign a Teleworker's Agreement and propose modifications to their managers. The guidelines specify rules related to hours worked, availability for phone calls, work practices, use of company-owned equipment, handling or company records, etc. Managers must also complete a survey related to the employee's suitability for teleworking.

Preliminary internal research suggested that teleworking resulted in increased project related work and a decrease in sick days (0 for participants). They estimate that teleworking could result in a $26,000 annual savings for Corporate Credit, due to reduced employee turnover and associated costs. Today, approximately 20 people in the Corporate Credit Department telework, though some telework only occasionally. There is currently no data on number of teleworkers throughout the Georgia Pacific Corporation.

PITNEY BOWES — Connecticut

Employees	▪ 3,000
Teleworkers	▪ 200+
Significant Metrics	▪ Improved ability to recruit employees with expectation of flexibility ▪ 300+ employees doing something one day a week other than driving their cars to work

Pitney Bowes, which has between 5,000 and 6,000 employees in Fairfield County, Connecticut, initially launched a teleworking program to address employee work/life balance issues. However, the focus has since shifted towards social and community responsibility, such as toxic emissions reduction. The company has many formal teleworking arrangements in place, with agreements specifying when the employee must call into the office, what equipment is to be installed in the employees' homes and any other relevant information. Informally, multiple staff telework a few days per month and are not required to report it to management. A total of 200+ employees telework on a regular basis. Another 100+ employees work compressed or shortened weeks. Approximately 20 percent of the employee population does something other than driving their cars to work one day a week or more. Pitney Bowes management believes productivity has increased with a noticeable "spike" in output during teleworking days. The reasoning for this is that teleworkers work during their own personal peak hours and have fewer interruptions at home, enabling them to use their time more effectively.

Teleworkers generally access Pitney Bowes via analog phone lines. DSL has not been used in the past because of security concerns, but the company is currently piloting DSL with some teleworking employees. The amount of hardware or software that is provided varies, depending on employee needs and the business unit policy and budget. There is no company-wide policy outlining who pays for technology.

Steering Committee Members and Participants

Last Name	First Name	Title	Agency/Company	Address	City	State	Zip	Phone	Fax	E-mail address
Ancar	Robert	Senior Transportation Analyst	New York State DOT	1220 Washington Avenue	Albany	NY	12232	518-457-3429	518-457-7943	rancar@gw.dot.state.ny.us
Babbidge	Tracy		Connecticut Department of Environmental	79 Elm St.	Hartford	CT	06106	860-424-3382		tracy.babbidge@po.state.ct.us
Basile	Thomas	Senior Marketing Manager	Verizon	1095 Ave. of the Americas	New York	NY	10036	212-395-4883	212-840-1458	Thomas.Basile@Verizon.com
Bogacz	Jerry	Planning Director	New York Metropolitan Transportation Council	Hunters Point Plaza 47-40 21st St	Long Island City	NY	11101	718-482-4559	718-482-6686	jbogacz@gw.dot.state.ny.us
Boucher	Mark	Civil Engineer I	New York State Department of Transportation, Passenger	State Office Campus, Bldg 4, Rm 134, 1220 Washington Avenue	Albany	NY	12232	518-457-8366	518-485-7563	mboucher@gw.dot.state.ny.us
Briegs	Karen	Associate Director, Clinical Information Center	Schering-Plough	2015 Galloping Hill Road, K152, 2175	Kenilworth	NJ	07033	908-740-2812	908-740-2901	Karen.briegs@spcorp.com
Butensky	Jeff	Environmental Planner	US EPA New England	One Congress Street	Boston	MA	02114	617-918-1665	617-918-1505	butensky.jeff@epa.gov
Cardinali	Noreen	Section Chief, Bureau of Statewide Planning Mobility Measures	New Jersey Department of Transportation	P.O. Box 600	Trenton	NJ	08621	609-530-5950	609-530-2909	Noreen.Cardinali@dot.state.nj.us
Ciaffone	John F.	President	TransOptions, Inc.	2 Ridgedale Avenue	Cedar Knolls	NJ	07927	973-267-7600	973-267-6209	jciaffone@transoptions.org

Last Name	First Name	Title	Agency/Company	Address	City	State	Zip	Phone	Fax	E-mail address
Earle	Rebecca	Legislative Assistant, Honorable Frank R. Wolf	U.S. House of Representatives	241 Cannon Bldg.	Washington	D.C.	20515	202-225-5136	202-225-0437	Becky.earle@mail.house.gov
Galgano	John	President	CommuterLink	130-07 26th Avenue	College Point	NY	11354	718-886-1343	718-886-1151	jgalgano@commuterlink.com
Goldman	Lois	Principal	North Jersey Transportation Planning Authority	1 Newark Centre17th Fl.	Newark	NJ	07102	973-639-8413	973-639-1953	lgoldman@njtpa.or
Hetherington	Margaret	Vice President, Marketing	Metropool	One Landmark Square	Stamford	CT	06901	203-388-4408	203-348-9252	pegh@metropool.com
Houghton	Edward	Director, Employee Relations and Work/Life	Pitney Bowes	1 Elmcroft Road	Stamford	CT	06926	203-440-6110	203-351-6759	Edward.Houghton@pb.com
Hutchinson	Ron	Director, Environmental Health and Safety	Telcordia Technologies	444 Hoes Lane, Room 2A168	Piscataway	NY	08854	732-699-3959	732-699-3959	rhutchin@telcordia.com
Jolly	Dennis	Supervising Planner	Connecticut Department of Transportation	2800 Berlin TPA	Newington	CT		860-594-2844	860-594-3445	Dennis.jolly@po.state.ct.us
Khan	Jan	Transportation Analyst	New York Metropolitan Transportation Council	Hunters Point Plaza 47-40 21st St	Long Island City	NY	11101	718-472-3029	718-482-6686	jkhan@gw.dot.state.ny.us
Levy	Bob	Marketing Director	Rideworks	389 Whitney Ave.	New Haven	CT	06511	203-777-7433	203-773-5014	blevy@rideworks.com
Lush	James	Project	Telecommute Connecticut, c/o	389 Whitney Ave.	New Haven	CT	06511	203-777-7433	203-773-5014	sciking@mindspring.com
Mongioi, Jr.	Frank T.	Marketing Manager	Meadowlink, Commuter Services	201 Route 17 North	Rutherford	NJ	07070	201-939-4242	201-939-2630	meadowlink@worldnet.att.net
Moyer	Rona	Planner	Nassau County Planning Department	400 County Seat	Mineola	NY	11501	516-571-5934	516-571-3839	rmoyer@mail.co.nassau.ny.us
Murthy	Krishna	Executive Director	Meadowlink Commuter Services	201 Route 17 North	Rutherford	NJ	07070	201-939-4242	201-939-2630	meadowlink@worldnet.att.net

Last Name	First Name	Title	Agency/Company	Address	City	State	Zip	Phone	Fax	E-mail address
O'Connell	Nancy	Long Island Regional TDM Coordinator	New York State DOT	State Office Building, Veterans Memorial Hwy	Hauppauge	NY	11788	631-952-6007	631-952-6120	nloconnell@gw.dot.state.ny.us
Offurum	Tony	Program Administrator-Commute Alternatives	Westchester DOT	112 E. Post Road, 4th Floor	White Plains	NY	10601	914-995-6365	914-995-2624	Tvo1@westchestergov.com
Paaswell	Robert		Region II, UTRC	City College of New York, Bldg. 1	New York	NY	10021	212-650-8072	212-650-8374	paaswell@tid1so.engr.ccny.cuny.edu
Siegel	Joseph	Attorney	EPA Region 2, Office of Regional Counsel	290 Broadway, 16th Floor	New York	NY	10007	212-637-3208	212-639-3199	Siegel.joseph@epa.gov
Siman	Rebecca		Verizon	2501 Church Road	Cherry Hill	NJ	08034	856-482-6319		Rebecca.siman@verizon.com
Smith	Gail	Project	Schering Plough	2015 Galloping Hill Rd, K-152, 2175	Kenilworth	NJ	07033	908-740-4237	908-587-5019	Gail.smith@spcorp.com
Stern	Robert	Section Chief, SIP	New Jersey Department of Environmental	401 East State Street, 7th Fl., P.O. Box	Trenton	NJ	08625	609-292-9905	609-633-6198	bstern@dep.state.nj.us
Stimolo	Jean	Executive Director	Rideworks	389 Whitney Ave.	New Haven	CT	06511	203-777-7433	203-773-5014	jstimolo@rideworks.com
Weiner	Edward	Senior Policy Analyst	Office of Policy Development, US DOT	400 7th Street, SW	Washington	D.C.	20590	202-366-5403	202-366-3393	Ed.Weiner@ost.dot.gov
Wilson	Robert	Executive Director	Southwestern Region Planning Association	888 Washington	Stamford	CT	06901	203-316-5190	203-316-4995	wilson@swrpa.org
Yilma	Meseret	Project	NYC DOT	40 Watts Street	New York	NY	10013	212-442-7182	212-442-7823	myima@dot.nyc.g
Zeman	Melanie	Environmental Protection Specialist	EPA Region 2	290 Broadway25th	New York	NY	10007	212-637-4022	212-637-3901	Zeman.Melanie@EPA.gov

Appendix 5-Steering Committee

An Assessment of Telework in the New York Metropolitan Area

Metropolitan Mobility Network
NYMTC, New York
April 23, 2001
Elham Shirazi, Consultant USDOT

1 Appendix 6 – 4/23 Meeting

Conference Report 106-940 provides the basis for this project.

- The Conference Report requires an assessment of the state of teleworking in greater New York and identification of incentives for greater adoption of teleworking
  - Formation of a steering committee
  - Geographic scope-non-attainment area for ozone

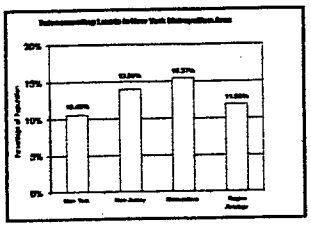
Appendix 6 – 4/23 Meeting

We have outlined a methodology for this project.

- Identify stakeholders and existing research
- Interview stakeholders
- Prepare an assessment
- Convene a design team
- Develop final report

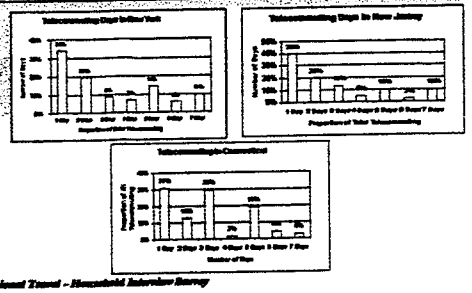
Appendix 6 – 4/23 Meeting

We have identified baseline telecommuting levels for the region.



Appendix 6 – 4/23 Meeting

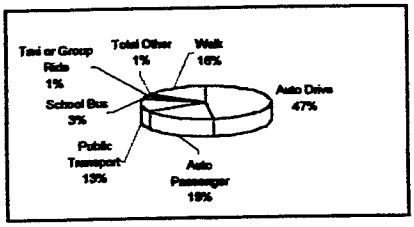
RT-HIS data was used to compute frequency of telecommuting....*



* Regional Travel – Household Interview Survey

Appendix 6 – 4/23 Meeting

As well as the most commonly used modes of transportation



Appendix 6 – 4/23 Meeting

Some legislation and statutes are in place today regarding telework....

- New Jersey (Assembly bills and legislative statute)
- Connecticut (Trip reduction and tax credit)
- New York (None yet)
- Conformity budgets
- State Implementation Plans
- Trading (New Jersey and New York)

...and an emissions trading program is currently in place in New Jersey.

- Existing telework and emissions trading program
  - Value of VOC- $2,250/ton
  - Value of NOx- $1,200/ton
  - Value of CO2- $2/ton
- Scenario-100 people, 3 days per week
  - $2,589 VOC
  - $714 NOx
  - $3,588 CO2

Various service providers currently promote and facilitate telework.

- New York
  - CommuterLink
  - Long Island Transportation Management
  - SmartCommute)
- New Jersey TMAs
- Connecticut
  - Telework Connecticut!
- Telecommunications Providers
- Independent Consultants

Several pilot programs have been conducted.

- NY State Office for Technology
- NY State DOT
- New York Telecommuting Project
- NYNEX Satellite Center

Many employers in the New York Metro region have telework programs.

- AT&T
- IBM
- Merrill Lynch
- New York Times
- Georgia Pacific
- Verizon
- Nabisco
- Avaya
- Schering-Plough
- PricewaterhouseCoopers
- American Express TRS
- Deutsche Bank
- Deloitte and Touche
- Dunn and Bradstreet
- Telcordia Technologies
- Johnson and Johnson
- Pitney Bowes

Some employers with programs have quantified results.

- AT&T ⇨
  - real estate savings = $25 M
  - in increased productivity = $100M
  - reduced turnover = $18M
  - carbon monoxide = 1.7M tons
  - hydrocarbons = 220,000 tons
  - NOx = 110,000 tons
  - carbon dioxide - 50,000 tons
- IBM ⇨
  - productivity gains - 10 to 20%
  - real estate savings - 2M square feet
- Merrill Lynch ⇨
  - increased productivity - 15%
  - 30% increased employee morale - 30%
  - sick day reduction - 3 days
  - retention/absenteeism savings - $10,000 per teleworker

Some employers with programs have quantified results (continued).

- Schering-Plough ⇨
  - retention costs - $266,000
  - real estate avoidance - $840,000
  - productivity gains - $360,000
  - increased effectiveness - $312,000
  - reduced sick time - $121,000
  - reduction in turnover - $1 M
  - avoidance in travel costs - $2.3M .
- American Express TRS ⇨
  - increased productivity (calls per day) - 40%
  - customer satisfaction increase - 25-28%
- Telcordia Technologies ⇨
  - productivity increase < 20%

Steering Committee

- Composition
- Size
- Frequency of Meeting
- Level of work
- Final product

Policies

- Federal
- State
- Regional
- Local

We have identified next steps.

- Form steering committee
- Modify report
- Schedule next meeting

An Assessment of Telework in the New York Metropolitan Area

Greater New York Steering Committee
NYMTC, New York
May 21, 2001
Elham Shirazi, Consultant USDOT
Kim Brant, Consultant USDOT

1 Appendix 7 – 5/21 Meeting

Agenda

■ Introductions	1:00 - 1:15
■ Project Goals	1:15 - 1:20
■ Timeline	1:20 - 1:25
■ Overview of existing legislation	1:25 - 1:35
■ Key Findings	1:35 - 1:45
■ Brainstorming (Break Out Sessions)	1:45 - 2:30
• Enablers and Barriers	
• Proposed Solutions	
■ Prioritization of Ideas	2:30 - 2:50
■ Next Steps	2:50 - 3:00

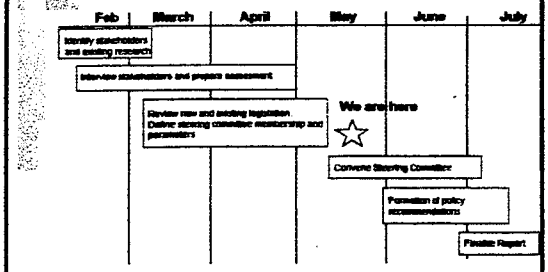
2 Appendix 7 – 5/21 Meeting

Conference Report 106-940 provides the basis for this project.

- The Conference Report requires an assessment of the state of teleworking in greater New York and identification of incentives for greater adoption of teleworking
  - Identify geographic scope-non-attainment area for ozone
  - Form steering committee
  - Identify multiple incentives for employers and employees to adopt telecommuting

3 Appendix 7 – 5/21 Meeting

We have established a project timeline...



4 Appendix 7 – 5/21 Meeting

...and have identified the role and timing of the Steering Committee...

- Meeting 1 (May 21):
  - Review of key findings
  - Identify barriers to widespread adoption of telecommuting
  - Initial identification of possible policies
- Meeting 2 (June, TBD):
  - Identification of Possible Policies
- Meeting 3 (July, TBD):
  - Define specifics of policy recommendations

5 Appendix 7 – 5/21 Meeting

Some legislation and statutes are in place today regarding telework....

- New Jersey (Assembly bills and legislative statute)
- Connecticut (Trip reduction and tax credit)
- New York (proposed legislation regarding telework pilot)
- Conformity budgets
- State Implementation Plans
- Trading (New Jersey and New York)

6 Appendix 7 – 5/21 Meeting

...and an emissions trading program is currently in place in New Jersey.

- Existing telework and emissions trading program
  - Value of VOC- $2,250/ton
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7

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  - CommuterLink
  - Long Island Transportation Management
  - SmartCommute)
- New Jersey TMAs
- Connecticut
  - Telework Connecticut!
- Telecommunications Providers
- Independent Consultants

8

Several pilot programs have been conducted.

- NY State Office for Technology
- NY State DOT
- New York Telecommuting Project
- NYNEX Satellite Center

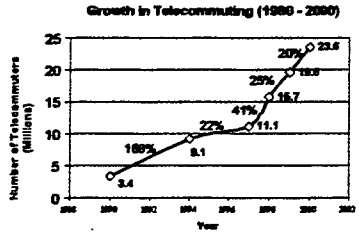
9

Many employers in the New York Metro region have telework programs.

- AT&T
- IBM
- Merrill Lynch
- New York Times
- Georgia Pacific
- Verizon
- Nabisco
- Avaya
- Schering-Plough
- PricewaterhouseCoopers
- American Express TRS
- Deutsche Bank
- Deloitte and Touche
- Dunn and Bradstreet
- Telcordia Technologies
- Johnson and Johnson
- Pitney Bowes

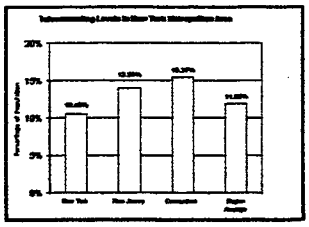
10

Teleworking grows by about 20% every year



11

ITAC data provides baseline telecommuting levels for the region.



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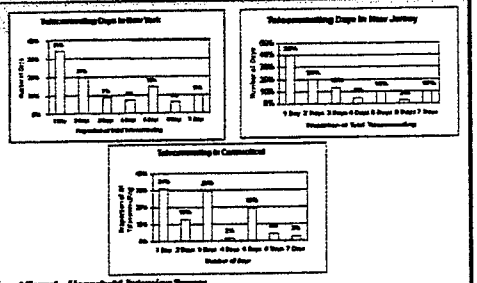
RT-HIS data provides insight into frequency of telecommuting....*



* *Regional Travel - Household Interview Survey*

13 *Appendix 7 – 5/21 Meeting*

Our research findings and potential implications are...

Key Finding	Implication/Action
Telecommuting receives more support and buy-in when presented as a work/life benefit, rather than a means of reducing vehicle miles traveled.	Promote telework as a work/life benefit, while ensuring adequate measurement of cost and efficiency benefits as well as reduction in VMT.
There is little awareness of telecommuting benefits at a policy development level.	Train and educate key players in benefits of telecommuting.
There is a shortage of well-organized resources in the region to help promote telecommuting and develop programs.	Establish resources at a national/federal level that can be accessed within the region.
Lack of regional dialogue.	Create regional network or steering committee to address issues.

14 *Appendix 7 – 5/21 Meeting*

Our research findings and potential implications are.....

Key Finding	Implication/Action
Need for consistent methodology for data collection, case studies and testimonials.	Integrate telecommuting with regional data collection efforts; generate local case studies.
No single agency acting as champion for telecommuting.	Create agency buy-off and create institutional and political champions.
Lack of strong public awareness about telecommuting.	Develop public awareness campaign that emphasizes bottom line benefits.
Lack of incentive programs for teleworking.	Create market based and general incentive programs for teleworking.
Telecenters have not been widely tested in greater NY Metro area.	Examine feasibility of establishing more telework centers.

15 *Appendix 7 – 5/21 Meeting*

Brainstorming

What can we do to increase current levels of telecommuting?

Rules of Brainstorming

- No criticism or editing of ideas.
- All ideas are good ideas - the crazier the better (Think Outside the Box).
- Build on each other's ideas.
- Go for quantity.

17 *Appendix 7 – 5/21 Meeting*

What things will keep us from increasing current telecommuting levels? (Barriers)

- Slow deployment of bandwidth
- Lack of support and buy-in from corporations
- Increased time at home may result in higher energy and utility bills for telecommuters
- Lack of quantifiable metrics to use as business case
-
-
-
-

18 *Appendix 7 – 5/21 Meeting*

What things will enable us to increase current telecommuting levels? (Enablers)

- Increased awareness
- Tax incentives
- Increased access to broadband capability
- Growing interest in work/life balance issues
-
-
-
-

19 Appendix 7 – 5/21 Meeting

What policies will strengthen Enablers or eliminate Barriers?

-
-
-
-
-
-
-
-

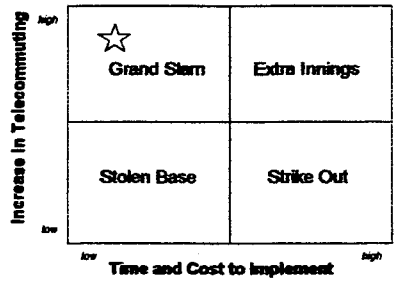
20 Appendix 7 – 5/21 Meeting

Rules for Prioritizing our Ideas - Nominal Ranking.

- Select top three choices
- Write choices on an index card and rank them 1, 2 or 3 (3 being highest or preferred choice)
- Choices are ranked by:
  - total score
  - number of people selecting choice
- Create a list of the top choices

21 Appendix 7 – 5/21 Meeting

We can use a payoff matrix to select the best policies and programs.



22 Appendix 7 – 5/21 Meeting

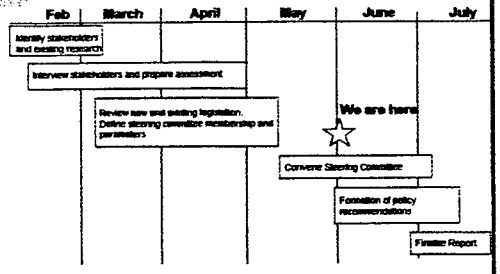
An Assessment of Telework in the New York Metropolitan Area

Greater NY Steering Committee
June 11, 2001
2 World Trade Center, Suite 2238
Transit Center, New York

Elham Shirazi, Consultant USDOT
Kim Brant, Consultant USDOT

1 *Appendix 8 – 6/11 Meeting*

We have concluded our first Steering Committee meeting



Appendix 8 – 6/11 Meeting

The steering committee requested a definition of telework.

Telework:

- Extends the workplace beyond the traditional office.
- Is a voluntary arrangement and not an entitlement.
- Replaces a commute trip.
- Can be part-time or full-time.

Appendix 8 – 6/11 Meeting

We asked the steering committee to identify barriers and enablers.

BARRIERS: *(Restraining Forces)* — Forces that keep us from reaching our goal of increasing telecommuting in the greater New York Metro area

ENABLERS: *(Driving Forces)* — Forces that drive us toward our goal of increasing telecommuting in the greater New York Metro area

Appendix 8 – 6/11 Meeting

The steering committee identified multiple enablers to telecommuting.

Corporate and Individual

- Real estate savings through hoteling and reduction in parking expense
- Increased productivity
- Employee cost reductions
  - Meals, Dry Cleaning
  - Transportation/Fuel

Technology and Legal

- Improved connectivity
- Increased computer literacy
- Ease and reduced cost of obtaining computer equipment
  - Docking stations and lap tops
- Existing and Proposed Legislation
  - Pilot Programs
  - Tax Credits

Appendix 8 – 6/11 Meeting

The committee also identified legal, corporate and technological barriers...

Perceived Corporate Barriers

- Lack of management leadership
- Lack of institutional adoption – (formal vs. informal programs, reluctance to formally adopt programs)
- Poorly managed programs - not managed by objectives
- Viewed as entitlement - "Haves" vs. "Have-Nots"
- Lack of Guidelines
- Limited cost benefit analyses performed to date (technology vs. increased productivity)
- Lack of corporate buy-in

Technological and Legal Barriers

- Physical space constraints - e.g., workers do not have space at home
- Companies must deal with multiple telecommunications service providers
- Possible need to equip employees at two locations
- Low awareness of workers compensation, liability, OSHA issues
- Securing Union buy-in

Appendix 8 – 6/11 Meeting

...as well as marketplace and individual barriers.

Marketplace, Institutional	Perceived Individual Barriers
■ Lack of resources available to companies in planning stages ■ Lack of access to guidelines for implementation ■ Lack of publicly available success stories and testimonials	■ Teleworkers might fear lack of connection and visibility ■ Need for face-to-face meetings and communications ■ Inability to measure productivity at home

Appendix 8 – 6/11 Meeting

Let's Prioritize - Which Barriers are Most Critical?

Rules for Prioritizing.

- A numbered list of barriers is on the wall to be used by in-person participants
  - Each participant has ten dots, which may be allocated to those barriers that participant feels are most critical.
  - Please place no more than three dots next to any one barrier.
- We have provided phone participants with a numbered list of barriers
  - Each participant has ten points to allocate to those barriers that participant feels are most critical.
  - Please do not allocate more than 3 points to any one barrier.
  - Elhass will speak with call on each participant to gather the scores each participant wishes to allocate to barriers, by barrier number.

Appendix 8 – 6/11 Meeting

The Most Critical Barriers to Telecommuting Are:

- We will provide a list of barriers which receive the highest score.

Appendix 8 – 6/11 Meeting

We have outlined some policies to address marketplace issues...

	Proposed Policies
1	Promote telework as a worklife benefit, but ensuring adequate measurement of cost and efficiency benefits as well as VMT.
2	Establish program to train and educate key players in benefits of telecommuting.
3	Establish national/federal telecommuting resources that can be accessed within the region.
4	Government lead programs (mandate Government agency involvement).
5	Create regional network or steering committee to address issues.
6	Provide proposals for zoning legislation.
7	Examine feasibility of establishing telework centers (work locations).

Appendix 8 – 6/11 Meeting

...as well as policies to address corporate and technological barriers.

	Proposed Policies
8	Design "Model" Program • Goals and Goal Setting • Establish standards for programs, job types, metrics and baseline data • Risk management standards • Ergonomic and home office space standards • Cost/Benefit Model and Analysis • Technology and Security Issues
9	Create connections between ozone action days and impact of teleworking.
10	Find means to reward organizations for involvement
11	Work with Unions to define telecommuting as a Union benefit
12	Establish a consortium of telecommunications providers.
13	Establish a main group or agency that would subcontract to a variety of telecommunications providers.

Appendix 8 – 6/11 Meeting

We have also outlined some additional policies that address multiple issues.

Proposed Policies	
14	Integrate telecommuting with regional data collection efforts; generate local case studies.
15	Create agency buy-off and create institutional and political champions.
16	Establish strategic alliances.
17	Find private sector champions.
18	Develop public awareness campaign that emphasizes bottom line benefits.
19	Provide outreach to municipalities.
20	Explore market based and general incentive programs for teleworking (emissions trading and tax incentives).
21	Involve major office supplier to establish furniture and home office standards

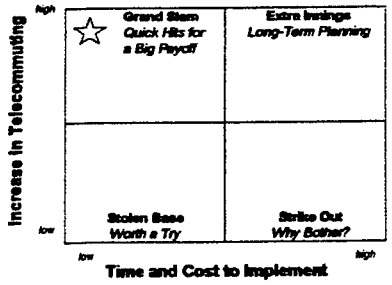
Appendix 8 – 6/11 Meeting

Rules for Prioritizing Policies.

- A numbered list of policies is on the wall to be used by in-person participants
  - Each participant has ten dots, which may be allocated to those policies that participant feels are most critical.
  - Please place no more than three dots next to any one policy.
- We have provided phone participants with a numbered list of policies
  - Each participant has ten points to allocate to those policies that participant feels are most critical.
  - Please do not allocate more than 3 points to any one policy.
  - Elham will speak with call on each participant to gather the scores each participant wishes to allocate to policies, by policy number.

Appendix 8 – 6/11 Meeting

At our next meeting, we will fill in the matrix with the chosen policies.



Appendix 8 – 6/11 Meeting

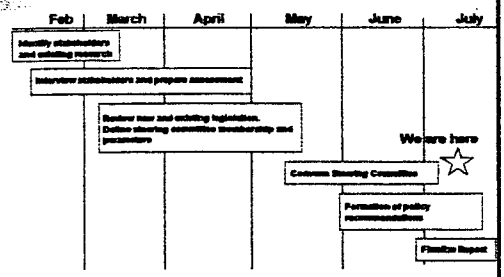
An Assessment of Telework in the New York Metropolitan Area

Greater NY Steering Committee
July 11, 2001
2 World Trade Center, Suite 2238
Transit Center, New York

Elham Shirazi, Consultant USDOT
Kim Brant, Consultant USDOT

1 Appendix 9 – 7/11 Meeting

We have concluded our first two Steering Committee meetings.



Appendix 9 – 7/11 Meeting

On June 11, the steering committee modified the definition of telework.

Telework:

- Extends the workplace beyond the traditional office.
- Is typically a voluntary arrangement and not an entitlement.
- Replaces a commute trip.
- Can be part-time or full-time.
- *Does not apply to home-based businesses or sales oriented occupations.*

Appendix 9 – 7/11 Meeting

On June 11, we identified some new barriers to telecommuting.

- Lack of control over vendors supplying technology (data/voice)
- Reengineering office tools (software/paper systems) to be reachable from remote locations
- Lack of corporate incentives
- Lack of government leadership and coordination (local/county, state/region)

Appendix 9 – 7/11 Meeting

We then ranked the barriers (51 votes possible for each barrier).

Lack of management leadership	29
Lack of corporate buy-in	21
Lack of resources available to companies in planning stages	12
Lack of publicly available success stories and testimonials	12
Lack of guidelines	12
Limited cost-benefit analyses performed to date (technology vs. increased productivity)	12

Appendix 9 – 7/11 Meeting

We then ranked barriers (continued).

Lack of government leadership and coordination (local/county, state/region)	11
Lack of corporate incentives	10
Low awareness of workers compensation, liability and OSHA issues	8
Viewed as entitlement – "Haves" vs. "Have-Nots"	8
Poorly managed programs – not managed by objectives	7
Teleworkers might fear lack of connection and visibility	6

Appendix 9 – 7/11 Meeting

We then ranked barriers (continued).

Lack of access to guidelines for implementation	6
Inability to measure productivity at home	5
Lack of institutional adoption – formal vs. informal programs, reluctance to formally adopt programs	3
Physical space constraints – e.g., workers do not have space at home	3
Securing Union buy-in	3

Appendix 9 – 7/11 Meeting

We then ranked barriers (continued).

Reengineering office tools (software/paper systems) to be reachable from remote locations	2
Possible need to equip employees at two locations	2
Companies must deal with multiple telecommunications service providers	1
Lack of control over vendors supplying technology (data/voice)	1
Need for face-to-face meetings and communications	1

Appendix 9 – 7/11 Meeting

After ranking, we grouped the barriers into the three most critical.

■ Buy-in / Management Leadership	75	43.6%
■ Guidelines / Available Data • Productivity • Cost/Benefit Analysis • Education > Visibility > Connectivity > Productivity > Workers Compensation / OSHA	74	43.0%
■ Government Leadership • Incentives	23	13.4%

Appendix 9 – 7/11 Meeting

We also reviewed our recommended policies and identified two new ones.

- Create dedicated funding sources for implementation of programs
- Include telework in regional planning and goals for conformity budgets (as a separate line item)

Appendix 9 – 7/11 Meeting

We then selected our preferred policies (51 votes possible for each).

Proposed Policies	Votes
Design "Model" Program • Goals and Goal Setting • Establish standards for programs, job types, metrics and baseline data • Risk management standards • Ergonomic and home office space standards • Cost/Benefit Model and Analysis • Technology and Security Issues	29
Establish program to train and educate key players in benefits of telecommuting.	19
Create dedicated funding sources for implementation of programs.	18
Promote telework as a work/life benefit, but ensuring adequate measurement of cost and efficiency benefits as well as VMT.	15

Appendix 9 – 7/11 Meeting

We then selected our preferred policies (continued).

Proposed Policies	Votes
Develop public awareness campaign that emphasizes bottom line benefits.	13
Explore market based and general incentive programs for teleworking (emissions trading and tax incentives).	13
Government lead programs (mandate Government agency involvement).	9
Establish strategic alliances.	7
Include telework in regional planning and goals for conformity budgets - separate line item.	7
Create regional network or steering committee to address issues.	6

Appendix 9 – 7/11 Meeting

We then selected our preferred policies (continued).

Proposed Policies	Votes
Find private sector champions.	6
Establish national/federal telecommuting resources that can be accessed within the region.	5
Find means to reward organizations for involvement.	5
Work with Unions to define telecommuting as a Union benefit.	5
Create agency buy-off and create institutional and political champions.	5
Establish a consortium of telecommunications providers.	3
Provide outreach to municipalities.	2

We then selected our preferred policies (continued).

Proposed Policies	Votes
Provide proposals for zoning legislation.	1
Examine feasibility of establishing telework centers (work locations).	1
Create connections between ozone action days and impact of teleworking.	1
Integrate telecommuting with regional data collection efforts; generate local case studies.	1
Involve major office supplier to establish furniture and home office standards.	1
Establish a main group or agency that would subcontract to a variety of telecommunications providers.	0

We grouped common policies and selected three top choices.

	Total	%
■ Develop a model program; provide one-on-one assistance to companies	67	43.8%
■ Public awareness campaign/ Educate companies on work/life and other benefits of telecommuting	50	32.7%
■ Create Dedicated Sources of Funding	18	11.8%
■ Create market-based tax incentives	18	11.8%

Each proposed policy addresses all of the top critical barriers we identified.

Top Barriers	Policy Recommendations
• Buy-in / Management Leadership	• Develop a model program; provide one-on-one assistance to companies
• Guidelines / Available Data	• Public awareness campaign; Educate companies on work/life and other benefits of telecommuting
• Government Leadership	• Create Dedicated Sources of Funding
	• Create market-based and tax incentives.

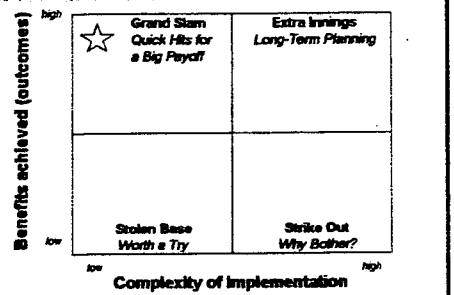
We now need to further define our policy recommendations.

- Who (which agency or agencies) should fund the program or policy?
- Who should administer the program or policy?
- What are the projected outcomes of the program? For example:
  - Increased corporate buy-in
  - Increased interest in telecommuting
  - Greater implementation ease
  - Increased Government involvement
  - Better access to and use of data

We need an open dialogue to brainstorm policy specifics.

Proposal	Who Should Fund It?	Who Should Administer It?	What are the projected outcomes?
Develop a model program; provide one-on-one assistance to companies			
Public awareness campaign/educate companies on work/life and other benefits of telecommuting			
Create dedicated sources of funding			
Create market-based and tax incentives			

Which of our policies represents a "Grand Slam"?



Next Steps:

- Refine Policy Recommendations
- Draft Report for DOT Review/Approval
- Compile Comments from Steering Committee
- Complete Report and Deliver to Congress

Appendix 10 - Hypothetical Savings from an Emissions Trading Scheme

The following table shows the amount of emissions that could be avoided in one year by a telework program with 1,000, 3,000, and 5,000 participants each working from home one day per week.

New York/Northern New Jersey/Connecticut
Emissions Savings for One Year
(assumes each participant teleworks one day per week)

	1,000 partic	3,000 partic	5,000 partic
VMT Saved	1.25 mil mi	3.75 mil mi	6.25 mil mi
VOC Emis Saved	4.0 tons	12.0 tons	20.0 tons
NOx Emis Saved	1.7 tons	5.1 tons	8.5 tons
CO2 Emis Saved	500 tons	1,500 tons	2,500 tons

Assumptions:

1. Average of 25 VMT avoided by each teleworker on days not traveling to work. (Source: literature review and similar metropolitan areas.)
2. Average Total Hydrocarbon emissions of 2.9 grams per mile. (Source: USEPA/NVFEL, "Annual Emissions and Fuel Consumption for an 'Average' Passenger car," April, 1997 (updated July, 1998)
3. Average NOx emissions of 1.5 grams per mile. (Source: USEPA/NVFEL, op.cit.)
4. Average CO2 emissions of 0.8 lbs per mile. (Source: USEPA/NVFEL, op. cit.)