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TELECOMMUTING TODAY

Trends in State-level Implementation



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Abstract

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ABSTRACT: This report provides an overview of the programmatic and policy actions taken by several states to incorporate telecommuting as a travel demand management (TDM) strategy and outlines a variety of successful telecommuting initiatives. This information is intended to assist Rhode Island in developing an approach to telecommuting that is informed by the strengths and weaknesses of methods tested around the country.

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EXECUTIVE SUMMARY

Telecommuting is a Transportation Demand Management (TDM) strategy aimed at reducing peak hour highway congestion by allowing commuters to work from home or a nearby telework center on certain days of the week. Once perceived as a panacea for solving urban highway congestion, telecommuting is now regarded as simply one ingredient of maintaining a well-balanced transportation system. While studies have shown that telecommuting can improve highway congestion and air quality, telecommuting as a sole TDM action will produce a relatively small amount of these savings. Additionally, there is insufficient evidence thus far that shows telecommuting has any significant impact on metropolitan land use patterns, or exacerbates urban sprawl in any way.

States have typically enacted either a statewide telecommuting policy to encourage individual agency adoption of telecommuting as a work option, or have designed telecommuting service programs that employ specialists who work with the private sector to design telecommuting programs tailored to individual business needs. Several states have adopted telecommuting policies and programs as a part of their state TDM strategy. These include Arizona, Connecticut, Kentucky, Minnesota, Oregon, Texas, Utah and several others.

Telecommuting has the potential to:

- ✓ Reduce Total Passenger VMT by 1%
- ✓ Reduce Commuting VMT by 3%
- ✓ Reduce gasoline consumption by 1.5%
- ✓ Reduce NO_x emissions by 1.6%
- ✓ Reduce CHC emissions by 2.1%
- ✓ Reduce CO emissions by 2.6%
- ✓ Save ~110 hours/year/telecommuter in travel time

This report serves as a primer for the Rhode Island Statewide Planning Program, exploring the implementation methods employed by other states in adopting telecommuting as a TDM strategy. Recommendations for the implementation of telecommuting as a TDM strategy in Rhode Island include:

- ⇒ Formation of a state committee on telecommuting to determine the desire and willingness of government and the public to pursue telecommuting as a TDM strategy.
- ⇒ Selection of one state agency for a one-year pilot project, testing a model telecommuting program.
- ⇒ Institution of a public telecommuting service program that will assist private-sector businesses in the design and operation of individual telecommuting programs as a service of the Express Travel Program, a division of the Rhode Island Public Transit Authority.

This technical paper has been prepared to serve as a resource to assist the State of Rhode Island in considering how the state might pursue telecommuting as a travel demand management (TDM) in support of transportation and air quality goals outlined in the State Guide Plan.

A successful telecommuting program would support several goals and recommendations outlined in *Transportation 2020*, the Ground Transportation Element of the State Guide Plan:

7-1-1 *Achieve more concentrated development patterns*

To reduce congestion and improve air quality, encourage the use of telecommuting by private business, both home-based and at satellite offices where such actions support the State Land Use Policies and Plan.

7-2-4 *Encourage alternatives to single-occupant auto travel*

Develop a program for state government, as a major employer leading by example, to encourage alternative modes. For example, examine the policy of providing free parking for state employees. Encourage use of financial incentives, similar to those provided by the private sector.

This paper focuses on programmatic and policy actions taken by states to develop telecommuting as a TDM strategy. While it does not go into specific detail on the mechanics of individual telecommuting programs, it does outline a variety of successful telecommuting initiatives in order to assist Rhode Island in developing an approach to telecommuting that is informed by the strengths and weaknesses of methods tested around the country.

This report seeks to clarify the terminology, costs and benefits, and dispel the myths associated with telecommuting, while highlighting the most important factors to ensure program success. Case studies are provided to serve as a guide, offering suggestions on policy and program design as adopted by other states. Part One of this paper provides an overview of telecommuting, discussing its origins, terms and applications to transportation, air quality and land use. The primary methods states have used to implement telecommuting as a TDM strategy are outlined, and case studies of these methods presented in Part Two. The keys to creating a successful telecommuting program, and the various costs and benefits associated with such programs are discussed in Part Three. Finally, Part Four offers on how telecommuting might be implemented in Rhode Island as a TDM strategy.

This paper was developed by Mr. Peter Karon, a graduate student in City Planning studying at the Hunter College of the City University of New York, working under the supervision of Program staff. Its preparation supports Tasks 2704 and 2705—Highway Studies/Transit Studies of the Program's Fiscal Year 2002 Work Program.

PART ONE: INTRODUCTION-AN OVERVIEW OF TELECOMMUTING

A. Background

Telecommuting is the act of using telecommunications technology to bring work to the worker, eliminating the need to travel to a common work site in order to perform job functions. Today, there are an estimated 3.6 million telecommuters nationwide, with the average telecommuter working from home nine days a month (9).

Telecommuting includes a variety of non-standard employment arrangements allowing employees to work at home or from another nearby locations. Telecommuting programs offer benefits to employers and employees through reduced office space needs, improved productivity, and greater flexibility for individual workers. By permitting people to work from home or nearby worksites, telecommuting removes vehicles from the highway during peak commuter hours, reducing congestion levels and accidents, while improving air quality, and decreasing energy consumption.

Studies have shown that eighty-seven percent of telecommuters typically commute alone. The average telecommuter drives eighteen miles one-way to work, with the work trip lasting an average 26-27 minutes. When adding errands to the commute, the telecommuters will travel an additional 7.9 miles per day. On days the telecommuter works from home, he/she will drive an average 9.3 miles/day for personal and family errands. By working from home, telecommuters will save an average 52.9 minutes each workday in travel time, or about an hour a day. This is the equivalent of 6 full days/year, assuming the telecommuter works one day per week from home, with two weeks annual vacation time. Telecommuting will decrease round trip commuter travel by roughly 1,800 miles per year per telecommuter (2).

Telecommuting is a relatively new approach to work arrangements. As a result, the extent of telecommuting programs, techniques, benefits and limitations, keys to success, and other related issues are just beginning to be documented. Further, the roles federal, state, and local government can play in encouraging the use of telecommuting are not well known. Telecommuting is of interest to most government agencies for its ability to improve air quality and highway congestion. The public cost of urban traffic congestion is not limited to personal stress, costs of delays and corporate productivity losses; commuting in general, and peak-hour congestion in particular, are major sources of air pollutants.

The Clean Air Act, as amended in 1990, requires that stringent measures be taken in many regions that reduce air pollution typically by constraining vehicular traffic. Telecommuting is one tool that can be used to better manage the demand for transportation, especially during typically congested commuter hours. In addition to reducing congestion and decreasing air pollution, benefits also include reductions in petroleum use and reductions in the potential for highway accidents. Telecommuting can also expand employment opportunities for those with impaired mobility and those tied to the home for other reasons.

Although telecommuting is conceptually simple, it touches on many facets of life, raising important questions and issues for which answers are not yet available. The degree to which telecommuting is adopted, the specific forms it takes, and the magnitude of public benefits actually obtained by adopting telecommuting policies depends largely on the attitudes of people toward their work and workplace, the adaptability of corporate/government culture, the nature of the work performed, and the specifics of change in telecommuters' travel behavior (2). Not surprisingly, there is wide variation among predictions for the future of telecommuting and its impacts on transportation. A number of factors will influence the widespread use of telecommuting and the ability to reach set targets. These include the nature of a particular business, specific work tasks, management structures, employee characteristics, costs, legal issues, traffic congestion levels, air quality concerns, and advances in technologies.

B. Telecommuting Terminology

The following terms are typically used in telecommuting literature and policies:

Telecommuting is working from a location that allows employees to meet customer needs by performing job responsibilities away from an assigned office. Homes or telework centers are equipped with information technology that is appropriate for the tasks being performed.

A **telecommuter** is an employee who uses a set of technologies to perform job responsibilities at more than one of the following locations:

- assigned office
- home
- telework center

A **mobile worker** is an employee who travels continuously and whose current work location is his/her home or an assigned office. The duties of these positions generally require the employee to meet and work on-site with clients/customers who are dispersed throughout a district or geographic territory. While these jobs may be enhanced by additional sets of technology, a mobile worker is not considered to be a telecommuter. This definition is included in this report to distinguish between this work mode and that of the telecommuter.

A **telework center** is an alternative work location that provides offices for employees working away from an assigned office. The telework center is designed for use by employees of a particular company or for use by employees of various companies. The telework center is located closer to the employees' residence than their assigned office. A telework center provides personal or shared office space, telecommunication links and other technologies.

C. Impacts of Telecommuting

Once perceived as a panacea to solving highway congestion, the impacts of telecommuting on traffic, air quality and metropolitan land use remain largely unknown. What has been observed is that telecommuting will not have as big an impact on reducing highway congestion as was originally thought. This is due in large part to a variety of obstacles that must be overcome when initiating a telecommuting program, as well as the increasing proportion of total vehicle miles traveled being for non-work purposes. Many feel that the attention to detail required for starting and operating a telecommuting program is not worth the savings in reduced vehicle miles traveled and business operating costs, unless done at a large scale.

Telecommuting is growing slowly as a work option, and is one of a basket of TDM strategies that a metropolitan region can employ. Estimating the amount of telecommuting that will occur in the future has become specifically challenging as one must determine who is actually eligible to telecommute, of those who wants to telecommute, and of those, who will actually telecommute and for how many days/week and for how long? A 1993 report forecasting national telecommuting growth in the United States for the United States Transportation Department (USDOT) made the following projections for 2002 (9).

- ⇒ There will be 7.5-15.0 million telecommuters nationwide. (*5.2-10.4% of the total labor force.*)
- ⇒ 49.7% will work from home, 50.3% will work from telework centers.
- ⇒ Telecommuters will telecommute an average of 3.4 days/week.

With this range of scenarios, the USDOT made the following forecasts estimating the impacts telecommuting will have on transportation, air quality, and metropolitan land use.

Transportation

Forecast savings from telecommuting by the year 2002 based on the above projections indicate that telecommuting will save somewhere in the range of 17.6-35.1 billion Vehicle Miles Traveled (VMT) annually, nationwide. This translates into a 0.7-1.4% reduction in total passenger VMT, or a 2.3-4.5% reduction in commuting VMT.

Total fuel savings will be an estimated 840-1679 million gallons of gasoline per year, or 1.1-2.1% of total fuel use.

The average telecommuter will also be expected to save 110.3 hours/year in driving time, adding to a total of 826-1652 million hours saved annually.

Air Quality

The USDOT forecast for emission reductions based on the above scenarios and VMT savings suggest a:

- ⇒ 1.1-2.2% reduction in nitrous oxide (NO_x) emissions.
- ⇒ 1.4-2.7% reduction in CHC emissions.
- ⇒ 1.7-3.4% reduction in carbon monoxide (CO) emissions.

Land Use

There has been great debate on the potential impacts telecommuting may have on metropolitan land use patterns by encouraging people to work from home. While conclusive studies have yet to be made on this topic, most feel that telecommuting will have little to no effect on long-term land use patterns based on a combinations of factors. These include the relatively low number of people forecast to participate in telecommuting programs, the geographic dispersal of individual telecommuters, and the fact that those telecommuting typically only do so for a limited time and do not telecommute long enough to have an impact land use decisions.

Telework centers on the other hand are more likely to impact land use patterns in the areas directly adjacent to and leading toward such centers (9). Since telework centers are fixed, physical structures they are more permanent than the individual telecommuter who can more easily switch residences or simply opt out of a telecommuting program. Telework centers also cater to a large number of people, and not dependent on any single telecommuter or commute pattern. Telework centers are concentrated enough that they may produce adequate demand for ancillary services that would then locate in the vicinity of the telework center. Thus telework center should be developed in locations that are consistent with long-term land use planning goals, as is suggested in the Rhode Island 20-year Ground Transportation Plan.

In short, telecommuting can have positive impacts on reducing travel demand, improving air quality, and reducing fuel consumption and aggregate travel time. The intensity of the impact telecommuting will have on each of these factors will depend largely on the aggressiveness of telecommuting programs, the receptiveness of employers and employees to such programs, and the intensity of metropolitan traffic congestion acting as a catalyst for encouraging people to telecommute.

PART TWO: IMPLEMENTATION METHODS/CASE STUDIES

Telecommuting remains largely a voluntary action of employers and employees and cannot be mandated by government. However, through zoning restrictions localities can adopt off-street parking regulations and policies that encourage transit-use, rideshare or telecommuting as work options among new employers looking to build office space. The research conducted for this report identified two primary methods states use to implement telecommuting as a TDM strategy among public and private sector employers. These methods include adopting a state telecommuting policy (often with specific telecommuting rate targets set for those working in heavily congested areas) that encourage state agencies to develop telecommuting programs for employees; or creating a state-funded telecommuting service program that assists the private sector in the design and implementation of individual telecommuting programs for their business. Further details of each method follows:

1) Adopt a state telecommuting policy

A statewide telecommuting policy is designed and adopted to support, encourage and often guide individual government agencies in the creation and adoption of a telecommuting program for that agency. These state policies typically provide guidelines and minimum standards that must be a part of every agency program, setting minimum requirements to protect state liability. To enforce the adoption of telecommuting programs among government agencies, some policies set target reduction rates requiring a fixed percentage drop in single-occupancy vehicular trips being made to work location in federal non-attainment zones for air quality. The adoption of a state telecommuting policy is the most common method used by states to implement telecommuting as a TDM strategy by encouraging telecommuting among public agencies.

2) Establish a state-funded telecommuting service program

Some states have instituted programs to aid the private-sector in designing telecommuting programs for their individual business. In these programs, the state maintains a staff of experienced professionals in such fields as training, human resources, telecommunications, computing, and networking who help individual businesses design and/or launch customized telecommuting programs. These programs are typically offered as a free service of the state. While this is a less frequently employed method to encourage the adoption of telecommuting programs, it has proven successful in fostering the adoption of telecommuting programs among many private companies that would otherwise not have such programs. This method responds to research indicating that one reason employers do not initiate telecommuting programs is their lack of available on-staff expertise to establish, operate and evaluate such programs (8).

The following section will provide more insight and detail into program and policy specifics adopted by states, providing an outline of individual state telecommuting policies and programmatic descriptions of various telecommuting service programs.

CASE STUDIES

TELECOMMUTING POLICIES

Several states have enacted telecommuting policies encouraging the creation of telecommuting programs among state agencies. Due to the flexibility in how a program can be designed and operated, and the intimate relationship between the program and its participants, most states have designed their policies to serve as a guideline assisting agencies with key elements to consider when designing their individual programs. The following examples are policy goals and program outlines taken from four state telecommuting policies. The Minnesota state policy has been cited in a 1997 Report to Congress as an example of best practices in telecommuting program/policy development (10). These case studies are presented in chronological order so as to better illustrate the evolution of telecommuting policy development.

State of Utah

In 1995, the State of Utah adopted a statewide telecommuting policy in response to a previous administrative mandate requiring that all federal, state, and local employers in Salt Lake and Davis counties, UT reduce their employee drive alone rate by 20% over a six year period (7). Telecommuting was considered one mean of achieving this reduction and a state telecommuting policy was written to encourage agency adoption of telecommuting programs.

The Utah policy was written as a combination between seven new policy statements relating specifically to telecommuting, and numerous existing regulations pertaining to software use and information resource management. These policies were to guide public agencies in designing their individual telecommuting programs by keeping these programs within the framework of existing state data/communication regulations.

The following seven policy statements were outlined specifically for telecommuting programs in Utah (7):

- Telecommuting is a privilege and not a right. The state may enact a telecommuting program where mutual benefits exist between employee and employer; and revoke such a program if it no longer benefits the state or agency.
- Management will determine work location, hours and assignments.
- Each agency must establish a telecommuting policy within the framework of state policy.
- Those participating in a telecommuting program must sign a contract.
- Telecommuters will not provide primary care during contractually agreed upon telecommuting hours for children or elders otherwise requiring a provider's care.
- State-supplied equipment should be used, but where private equipment is used the state will be released from any and all liability for such hardware/software.
- Telecommuting employees must comply with all applicable laws, state administrative rules, state policies, and agency rules.

Agencies were also required to develop additional security guidelines when designing their telecommuting programs. These guidelines were to include: a computer point-of-entry validation system, network security measures, appropriate data security policies, and physical security measures aimed at protecting telecommuting infrastructure (computers and equipment).

State of Minnesota

In 1996, the State of Minnesota adopted a statewide telecommuting policy standardizing the format as to how agency telecommuting programs were to be written. The policy was designed by the Minnesota Administration Department, Technology Office after a one-year pilot project conducted within that department in which sixty employees from fifteen different divisions participated. The pilot was considered successful and the program outline was adopted for statewide use (5).

The Minnesota Administration Department initiated the pilot program in late 1995. The one-year demonstration grew out of legislative and general interest in the state in exploring the use of telecommuting to address traffic and environmental concerns. Working with other state agencies, the department developed a telecommuting program that would be adequate for all agencies of the state. The program includes the official state policy and general guidelines on telecommuting, and provides examples of telecommuting expectations, surveys, home office requirements, evaluation measures, work plans, and training information that can be used by individual state agencies. A Telecommuting Advisory Committee guided the creation of this pilot program.

The Minnesota State Telecommuting Policy was written to the following outline:

Purpose Statement

Policy Statement

I. GENERAL INFORMATION SECTION

A) Vision

B) Policy Purpose

C) Statutory Information

D) Definitions

Defining: telecommuting, telecommuter, mobile worker, and telework center.

E) Benefits

1) Customers of State Agencies

2) Employer

Productivity, recruiting/retaining employees, image, absenteeism, overhead costs, and emergencies.

3) Employee

Commuting time & cost, flexible hours

4) Community

Community impact

- 5) Environment
Commuting

F) Other Considerations

II. POLICY SECTION

A) Employee Conditions

- 1) Compliance with Federal/State Employee Laws
- 2) Job Duties and Responsibilities
- 3) Compliance with Bargaining Agreements/Plans

B) Selection Process

C) Equipment, Software & Telephone Support

- 1) Equipment Support
- 2) Agency-provided Equipment
- 3) Record of Equipment
- 4) Employee-owned Equipment
- 5) Installation and Repair
- 6) Repair of Employee-owned Equipment
- 7) Business-use Restrictions
- 8) Return of Equipment
- 9) Notice to Supervisor
- 10) Personal-use Prohibited
- 11) Telephone Expenses

D) Data

- 1) Data Practices Act
A law specific to the State of Minnesota
- 2) Security
- 3) Privacy and Confidentiality
- 4) Data Retention

E) Location and Travel

F) Schedule

G) Weather Emergencies

H) Workers' Compensation

I) Liability

- 1) Extension of State Agency
- 2) At Home Workspace
- 3) Third Party Liability
- 4) Insuring State Owned Equipment
- 5) Insuring Employee Owned Equipment

J) At Home Work Space Responsibility

K) Telecommuter Understanding & Expectations

L) Communications During Work Hours

M) Performance

N) Dependent Care

O) Supplies & Expenses

P) Training

- 1) Training for Supervisors/Managers

2) Training for Employees

Q) Taxes

The pilot project, coupled with other efforts underway at the time, resulted in a number of follow-up activities and actions. As highlighted below, these included efforts by the Legislature, the Governor, state agencies, and other groups (8)

- ⇒ In 1994, the State Legislature passed a law requiring the preparation of a telecommuting program by any state agency intending to request office space, such as a new building, renovation or remodeling, or relocation. The plan must be approved by the Administration Department's Information Policy Office and reviewed by the Government Information Access Council.
- ⇒ The Governor declared the week of July 22, 1996, Telecommuting Week to heighten awareness about telecommuting. A variety of information was provided through media channels and numerous activities focused on explaining and promoting telecommuting.
- ⇒ In 1996, the Minnesota Transportation Department established the Cambridge Telework Center, for use by that department and other state agencies.

State of Oregon

By 1998, the State of Oregon enacted a statewide telecommuting policy outlining six basic rules guiding an agency's ability to adopt a telecommuting program. A model telecommuting agreement form was also provided for agency use (6).

The state telecommuting policy includes the following rules:

- Agencies may implement telecommuting as a work option for certain employees based upon specific criteria and procedures consistently applied throughout the agency.
- Employees shall sign and abide by a telecommuting agreement between the employee and the supervisor.
- The telecommuter's condition of employment shall remain the same as for non-telecommuting employees.
- The DAS Information Resource Management Division Network Security Policy shall be followed in cases of PC equipment and software modem connection to state computer security systems.
- Telework site office supplies shall be provided by the agency.
- In home work sites, furniture and equipment shall normally be provided by the telecommuter.

Commonwealth of Kentucky

The Kentucky Information Resources Management Commission and the Communications Advisory Council developed a detailed statewide telecommuting policy for the Commonwealth of Kentucky that was enacted in 1999 (4). This policy provides yet another, more detailed outline of how agencies are to design individual telecommuting programs, a concept spearheaded by the State of Minnesota in 1996. This example is included in this report because of the detailed nature of the policy, providing a good example of what should be included in a telecommuting policy outline for state agencies.

The state telecommuting policy was written to the following outline:

Article I General

Article II Definitions

- 2.01 Description
- 2.02 Scope

Article III Telecommuting Policies

- 3.01 Authority
- 3.02 Telecommuting Coordinator
- 3.03 Remote Access
- 3.04 Employee Selection and Eligibility
- 3.05 Management Support
- 3.06 Training
- 3.07 Scheduling
- 3.08 Hours of Work, Overtime Hours, and Time Reporting
- 3.09 Managing Records and Confidential and Sensitive Information
- 3.10 Support, Maintenance, Repair and Replacement
- 3.11 Employee Owned Equipment
- 3.12 Insurance and Liability
- 3.13 Physical Security
- 3.14 Health and Safety
- 3.15 Local Ordinances, Zoning and Tax Implications
- 3.16 Employee Rights
- 3.17 Termination of Participation
- 3.18 Assessment and Evaluation
- 3.19 Miscellaneous

Article IV Telecommuter's Agreement and Supervisor's Checklist

Article V Renewal of Telecommuting Agreement

Appendix A Telecommuter's Agreement

Appendix B Supervisor's Checklist for Telecommuters

At the state-level, adopting policies and developing guidelines that encourage the creation of telecommuting programs among state agencies is perhaps the best means of encouraging telecommuting among the public sector. The policies and programs set by the State of Minnesota (including the development of a telework center) have gained

federal recognition as an example of best practices in creating successful telecommuting programs in a 1997 report to Congress (8).

The bulk of statewide telecommuting policies that exist today were adopted only after a successful trial period had been completed, in which one state agency would run a pilot telecommuting program. Pilot programs, and the administrative initiatives to pass such legislation require a concerted effort by the Legislature, the Governor, state agencies, and other groups. Several other states have established telecommuting policies including Florida, California, Arizona, Texas and New York. The examples included in this report were based on a selection of what were perceived to be the most comprehensive and well-planned policies available today.

SERVICE PROGRAMS

Regional, metropolitan, and statewide telecommuting service programs are being implemented in many parts of the country today. In some cases these efforts are being led by the Metropolitan Planning Organization (MPO), while in other instances the state or regional transit authority has headed the effort. Telecommuting service programs often contain a mix of elements and activities including the adoption of goals and objectives supporting telecommuting, production and distribution of videos and brochures, marketing and public education efforts, establishment and operation of telework centers, and assistance with the design and implementation of individual private-sector telecommuting programs. The following are some examples of telecommuting service programs presently operating in various states.

Telecommute Connecticut

Telecommute Connecticut is a statewide initiative aimed at providing free assistance to employers with the design, development, and implementation of individual telecommuting programs as worksite alternatives. This service was created to make available the collective knowledge and talents of experienced professionals in such fields as training, human resources, telecommunications, computing, and networking that individual businesses otherwise may not have access to. By providing the specialists, Telecommute Connecticut hopes to ease the process in which telecommuting programs are designed and implemented, encouraging the growth of telecommuting programs among individual businesses (3).

The program is a free service for any employers located in the State of Connecticut, and is sponsored by the Connecticut Transportation Department and administered by Rideworks, a regional not-for-profit transportation services company serving Greater New Haven and Waterbury. Rideworks also operates the Telecommute Connecticut program in cooperation with Metropool (of Fairfield County) and the Rideshare Company (of Hartford). Rideworks, Metropool and Rideshare are regional, non-profit companies that work to encourage people to commute other ways than driving alone.

Telecommute Connecticut offers assistance and advisory services that include,

- ✓ Setting program goals.
- ✓ Creating human resources policies.
- ✓ Developing needs analysis for telephony and technology.
- ✓ Helping with the implementation of pilot programs and program assistance.
- ✓ Training.
- ✓ Cost/benefit analysis.
- ✓ Program evaluation measurement.

Additionally, Telecommute Connecticut provides a number of in-depth management, training and implementation resources including instructional videos, step-by-step guides for implementing successful programs, and guides outlining the necessary training needs for employees and managers when entering a telecommuting program.

A study commissioned by Telecommute Connecticut found that presently, about seven percent of Connecticut's 1.668 million workers (roughly 117,000) telecommute at least one day a month (the national average is ten percent). The percentage of worksites with telecommuters has remained about the same since 1997, but the number of telecommuters per site has increased substantially. Of those who don't currently telecommute, 27% said the kind of work that they do does lend itself to telecommuting, and 33% said they would like to work from home at least some of the time. In other words, there is plenty of demand for telecommuting on the part of the workforce. However, only 14% of non-telecommuters in the survey said their employers currently permit telecommuting, which means that employers still need to be convinced of the benefits (3).

Telecommute Connecticut choose to target the employers as the one who would need to be convinced most that telecommuting can actually work for their business. Additionally, since employers will be running their programs, Telecommute Connecticut must convince the employer that the added costs of such programs are marginal and that the benefits will outweigh the costs over time. The biggest drawbacks for employers in establishing telecommuting programs deal with such issues as the inability to hold spur-of-the-moment meetings and wrestling with the notion that employees must be on site to serve customers and perform other important tasks.

Telecommute Connecticut reports that the average Connecticut telecommuter works 25.5 miles away from home. This means every day spent telecommuting from home saves a 51 mile round trip by car per telecommuter. With an estimated 117,000 telecommuters in the state, telecommuting currently provides a reduction of 37.2 million vehicle-miles traveled every month (3).

Arizona Telecommuting Program

Telecommuting was first introduced to state agencies in Arizona in 1989. The program, which started as a pilot project, has grown steadily over the years. The initial pilot program allowed selected employees to telecommute from home one or two days a week. It was initiated to help address concerns over growing levels of traffic congestion and declining air quality standards, as well as enhancing worker productivity.

The success of the pilot effort led to the second phase of the program, which started in 1993. This effort focused on the development of a telecommuting program, information and graphic materials to promote the use of telecommuting within all state agencies. The preparation of this material was coordinated with the states of Washington and Oregon.

Currently, the third phase of the program is under way to implement telecommuting efforts among all state agencies in Maricopa County as mandated by the Governor. The goal of the third phase is to have 15 percent of state agency personnel participating in some type of telecommuting program by the end of 1998 (8).

The Arizona Administration Department conducted an extensive evaluation of the telecommuting program in 1996. The evaluation focused on the following elements.

- ⇒ Assess current perceptions, attitudes, and levels of support for telecommuting at different levels within the participating agencies.
- ⇒ Estimate the current level and potential for telecommuting within these agencies.
- ⇒ Determine what the purposes of telecommuting are and should be within state agencies.
- ⇒ Explore middle management's perception of the potential barriers and possible incentives to telecommuting.

A number of components were included in the evaluation to answer these questions. Interviews with senior management, focus groups with supervisors, research on other telecommuting programs, and surveys of employees, members of the state legislature, and the public were all conducted as part of the evaluation. The following highlight some of the main findings from the evaluation (8).

- ⇒ Senior managers tended to be positive toward telecommuting whether their organization has a program or not. The most frequently cited benefit of telecommuting by this group was increased work efficiency and productivity.
- ⇒ Supervisors were also supportive of telecommuting. Supervisors noted that telecommuters have fewer disruptions and are better able to work during their peak performance times. Improved staff morale among telecommuters was noted as a benefit. Positive experiences with managing telecommuters were expressed by a number of participants.
- ⇒ The survey of state employees, which included both telecommuters and non-telecommuters, indicated support for telecommuting between both groups. Benefits of telecommuting noted by state employees include increased productivity, reduced absenteeism and job turnover, improved job satisfaction, and more time with family. Telecommuters reported reduced stress levels and increased ability to meet work objectives.
- ⇒ Although not all of the legislators responding to this survey were aware of the demonstration program, most supported allowing state employees to telecommute. Potential benefits of telecommuting noted by the legislators included greater flexibility in balancing home and work requirements.
- ⇒ The results of the survey of the general public were generally favorable toward telecommuting and the state demonstration project.

The Administration Department provided assistance to participating groups during the pilot program and is continuing to help during full-scale deployment. Videos, brochures, guidelines, and other informative material have been provided to public agencies and private firms. These efforts are being coordinated with the activities being pursued by the Regional Public Transit Authority described in the next case study.

Phoenix Regional Public Transit Authority

The Regional Public Transit Authority (RPTA) in the Phoenix Metropolitan area has developed and implemented a multi-faceted program to encourage telecommuting in their

area. This effort has been coordinated with the activities of the state (mentioned previously), as well as those underway at other public agencies and private firms. Interest in telecommuting grew out of the mandated employee trip reduction requirements and other efforts to reduce commuter travel to enhance the environment. The following elements are included in the activities and services provided through the RPTA telecommuting program (10).

- **Public Information and Marketing**
The RPTA has developed information on telecommuting for the general public. Billboards, advertisements, and other media have been used to educate the public on the scope and benefits of telecommuting. Other activities, like the Telecommute America Week and a home page on the Internet, have been used to promote telecommuting and raise public awareness.
- **Public Agency and Private Business Support**
The RPTA provides interested agencies, firms, and groups with more detailed information on telecommuting programs. Presentations by RPTA staff are given on a regular basis and round table discussions with top management personnel have been hosted. These include general telecommuting guidelines, tips for developing telecommuting programs, and examples of telecommuter agreements.
- **Training**
The RPTA has developed two training courses on telecommuting. One is a two-hour session that provides a general overview of telecommuting and is intended for managers and top agency personnel. The second is a half-day session that provides more detailed training for individuals responsible for developing telecommuting programs within a company. A training manual has also been prepared for use with the courses. The manual contains sample policies, telecommuter agreements, surveys, and other information. These courses are offered on a regular basis.
- **Ongoing Technical Assistance**
Staff from the RPTA provide ongoing technical assistance to agencies and businesses interested in developing and maintaining a telecommuting program.

These efforts have been successful in raising awareness about telecommuting in the Phoenix area and in developing telecommuting programs among public agencies and private businesses. The RPTA reports that numerous agencies and businesses in the Phoenix area currently have some type of telecommuting program.

Dallas-Fort Worth Metroplex

The North Central Texas Council of Governments (NCTCOG) is the MPO for the Dallas-Fort Worth Metropolitan area. Working with other agencies and groups, including Dallas Area Rapid Transit (DART), the North Texas Clean Air Coalition, and the Fort Worth Transportation Authority (The T), NCTCOG is conducting a number of activities to

promote telecommuting and alternative commute modes. Many of these efforts are focused on the summer months, when the potential for “ozone alert” days is especially high (10).

The NCTCOG produced a telecommuting brochure that explains various approaches to telecommuting, outlining the basic elements to be considered in developing a telecommuting program, and providing suggestions on common issues that may be encountered in implementing a program. This brochure and other information on telecommuting have been distributed to public agencies and private businesses in the Dallas-Fort Worth area.

In addition, NCTCOG and other agencies have used a variety of public information and marketing techniques to promote telecommuting and the use of transit and ridesharing. For example, a series of Home Office 2000 contests were held during the summer of 1996 ozone season. These included the *Wannabe Telecommuter*, the *Messiest Home Office*, and the *Ultimate Home Office*. Prizes and copies of telecommuting guides and reports were awarded to the winning contestants (10).

The examples provided in this section are samples of what states have done to increase the public’s awareness to telecommuting, and in some cases provide technical assistance to ease the process of design, operation and evaluation of telecommuting programs among area businesses. Both statewide policies encouraging public agency adoption of telecommuting, and the various service programs bent on informing and assisting the public in developing telecommuting programs are all good approaches for government to develop telecommuting as a legitimate TDM strategy.

The following sections will focus more on the specific nature of telecommuting programs. These sections will explore the keys to designing successful telecommuting programs, as well as shed light on some of the expected costs and benefits associated with telecommuting programs.

PART THREE: KEYS TO SUCESSFUL PROGRAMS

The case studies examined in this report provide some insight into the components of successful telecommuting policies and programs. Although not present in every case study presented, a number of elements occur frequently enough to indicate they should be considered when developing any telecommuting program. The following elements appear to be most important in maximizing the benefits of telecommuting.

Management Support

Support from management in a business or agency is critical to the successful implementation of a telecommuting program. Management must be willing to provide the necessary financial support, as well as make changes in policy or procedures in order to accommodate telecommuting as an employee work option.

Employee Interest

While support from management is critical to the success of telecommuting programs, so too is interest from employees. In many cases telecommuting was most successful when promoted at the staff level. The early involvement and support of labor unions and other employee groups is vital, suggesting both bottom-up and top-down support is needed to develop successful telecommuting programs

Clear Policies

Clearly articulating agency or company policies and guidelines relating to telecommuting is another important aspect of creating a successful telecommuting program. In most cases, policies should identify the expectations of both employees and management. The policies should outline the specific requirements for telecommuters, such as the home work area, work hours, communications with the main office, etc. Support from the human resource or personnel department is also important to ensure that both supervisors and employees are able to obtain assistance during the implementation of a telecommuting program, as well as on an ongoing basis.

Appropriate Jobs

One must clearly identify the types of jobs or job tasks and functions that are appropriate for telecommuting. The following characteristics summarize the main factors used to help identify jobs that may be appropriate candidates for telecommuting.

- ⇒ Can work tasks be completed from home or a remote work site?
- ⇒ Can work tasks be completed without on-site or face-to-face interaction with customers or co-workers?
- ⇒ Is the equipment necessary to conduct work tasks available at home or at a remote work site?
- ⇒ Can job objectives be identified and measured?

Certain jobs are better suited to telecommuting than others. Examples of job tasks and functions that are good candidates for telecommuting include research, data analysis, communications, writing, and programming.

Appropriate Employees

Once the job titles and work tasks appropriate for telecommuting have been identified, the next step is to select the employees able to participate in the program. Employee work habits are a key element guiding the success of telecommuting in terms of maintaining adequate productivity. Employees who complete tasks successfully and reliably, enjoy working independently, and like to assume responsibility may be good candidates. The following questions should be used to help identify potential telecommuters.

- ⇒ Are you self-motivated and a self-starter?
- ⇒ Do you like to work independently?
- ⇒ Do you work well without supervision?
- ⇒ Do you have a home office or area where you can work at home without interruption?

Appropriate Managers and Supervisors

The selection of managers and supervisors overseeing telecommuters is as important as identifying appropriate telecommuters. Selecting supervisors should be done with care to ensure a successful program. Telecommuting may require managers to adopt new or modified management styles and procedures. Employee productivity must be measured by factors other than direct oversight. The lack of interaction with an employee on a daily basis must also be considered. Making sure that both managers and employees are comfortable with the telecommuting arrangement and have established a good working relationship is also important. In many of the case studies, signed agreements help establish the expectations of both supervisors and telecommuters.

Established Communication

Establishing regular communication methods will ensure the continuity of productivity in telecommuting programs. Techniques may include calling superiors at the start of work on telecommuting days, establishing regular times for phone calls, using e-mail and home pages, and making special arrangements in the case of an emergency.

Ongoing Monitoring and Evaluation

Most pilot and demonstration programs include some type of monitoring and evaluation component. These evaluations were used to help determine the various costs and benefits of the program, and results were used to determine if the program had a future in the agency. An ongoing monitoring program should be considered to ensure that a telecommuting program continues to provide the desired benefits for all parties involved. A monitoring program can help identify problems so that appropriate actions can be taken, and can document the benefits to all groups, which may be important in justifying the program.

Equipment and Support

Ensuring that telecommuters have the necessary equipment to perform their jobs is another important factor in successful programs. Although extensive equipment may not

be necessary, the case studies indicate that home computers, links to office computers, a second telephone line, fax machine, and pager are often required by telecommuters. These items may be provided by the employee, the employer, or the costs may be shared between the two. Providing telecommuters with access to ongoing computer support services and other assistance is also an important consideration.

The best telecommuting policies and programs have stemmed from pilot projects that had run for a minimum of one year. Establishing pilot projects will test the mechanics of a particular program, while generating interest among agencies and employees about the program. The following section will outline the primary benefits and costs associated with telecommuting and to whom they accrue.

PROGRAM BENEFITS & COSTS

This section considers the benefits that may be realized from telecommuting, as well as the costs associated with implementing and operating telecommuting programs. Due to the varying nature of jobs, equipment needs and administrative organization among agencies and companies it is virtually impossible to assess the “true cost” of an individual telecommuter to a firm on a macro-level. The only way of effectively assessing cost is by identifying who the telecommuter is and assessing what it will cost in this individual situation for this employee to become a telecommuter. Consequently, this section does not contain specific dollar costs as much as it identifies benefits and to whom they will accrue.

Employee Advantages

- ⇒ Decreased commute time, commute cost and frustration.
- ⇒ Increased flexibility in work schedule.
- ⇒ Improved work environment (control over physical environment, less stress from environmental noise, avoidance of “office politics”, etc.)
- ⇒ Greater job autonomy.
- ⇒ Increased employment opportunities (for those bound to the home for whatever reason).
- ⇒ Strengthened family and community ties.
- ⇒ Increased productivity.

Employee Disadvantages

- ⇒ Lack of interaction with coworkers.
- ⇒ Possibility of working too much.
- ⇒ Lack of support.
- ⇒ Problems with career advancement.

Employer Advantages

- ⇒ Reduced office space needs and costs (only attainable through large scale telecommuting programs.)
- ⇒ Increased employee productivity, morale, and commitment.
- ⇒ Improved quality of work output.
- ⇒ Reduction in casual absenteeism.
- ⇒ Improved ability to attract and retain employees.
- ⇒ Better ability to accommodate special needs and situations.
- ⇒ Improved public relations value.

Employer Disadvantages

- ⇒ Start-up and operating costs.
- ⇒ Need for more complex data security systems.
- ⇒ Less employee loyalty.
- ⇒ Business firm may look less credible.
- ⇒ A change in managerial style may be required.

Among the costs associated with telecommuting, the most significant for the employer is the start-up costs associated with designing and administering a telecommuting program. Ensuring the telecommuters' home is outfitted with proper equipment and that sufficient security exists for the transfer of data over phone lines into company servers are also complexities that prevent many firm from offering telecommuting as a work option.

A home office typically needs to be outfitted with a personal computer, modem, an additional, secured telephone line, a printer, fax machine, appropriate software and some sort of user service program should the telecommuter have a problem with his/her system. While advances in communications technology continue to drive down the price of such goods, a firm will have to work out what types of goods and services the employer will provide and will be provided by the telecommuter. For instance, most telecommuters have a personal computer at home, and use it for their work functions on days they telecommute. The use of equipment already owned by the telecommuter can reduce start-up costs but will also complicate contractual agreements on computer service and depreciation compensation.

The complexity involved with creating the administrative body responsible for operating the telecommuting program is also an obstacle to overcome when encouraging firms to adopt telecommuting as a work option. New job responsibilities would have to be placed on human resource employees, and the possibility exists where new positions might be needed to operate and maintain the telecommuting program. This will include having personnel that will serve as a moderator between telecommuters and immediate supervisors, and serve as an inspector when assessing the quality of at-home equipment, program evaluation and employee performance. Many firms argue that the minimal savings involved with instituting a telecommuting program would be more than offset once adding the additional administrative needs in order to operate such programs. This is one reason why major employers are often the only businesses with active telecommuting programs. Large business with a lot of employees can have a participation rate that creates scale economies in telecommuting (see Appendix for examples of major employers with telecommuting programs.)

The final section of this report explores the potential for implementing telecommuting as a TDM strategy in Rhode Island and what actions could be taken.

APPLICATIONS FOR RHODE ISLAND

The assortment of programs and policies presented in this report illustrate a variety of approaches to implementing telecommuting as a TDM strategy. Complications arise in that the scope in which the state wants to pursue telecommuting will effect what type of initiative will be pursued. Should telecommuting be advocated among state employees only with the state leading by example? Or should it be encouraged primarily among the private sector through some sort of telecommuting service program?

Aside from the goals outlined in the State's 2020 Ground Transportation Plan (see Page 2,) there are few additional initiatives underway to encourage telecommuting on a large scale in Rhode Island. United States Congressman Jim Langevin (RI Dist. 2) is a member on the U.S. House Small Business Committee. In March 2001, Congressman Langevin co-sponsored the Small Business Telecommuting Act. This bill was designed to direct the Small Business Administration to create a telecommuting pilot program that encourages small businesses to take advantage of modern technology and establish successful telecommuting programs that are cost effective, in order to make small business more competitive. This bill was introduced in March 2001 and is currently being referred to the House subcommittee. This bill is for a 2-year demonstration project designed as a special effort to reach out to small businesses that presently employ handicapped persons.

Aside from Congressman Langevin's role at the federal-level co-sponsoring a bill to encourage telecommuting among small businesses, Rhode Island officials have not actively pursued any sort of telecommuting proposal or plan for the state. It is the state MPO, the Statewide Planning Program of the Rhode Island Administration Department that is currently considering what impact telecommuting could have on the state in terms of improving air quality and reducing highway congestion.

In 1994 a study was conducted exploring the potential for telecommuting in Massachusetts, Rhode Island, and southern New Hampshire. This report explored the potential impact telecommuting could have on both Vehicle Miles Traveled (VMT) and the number of vehicle trips or "cold starts" produced. The research was conducted considering both home-based telecommuters and those commuting to telework centers with the following assumptions being made:

- Nominal participation in telecommuting will be reached for those that travel 10 miles or more to work.
- Participation drops off by 10% for every mile under 10 where a work commute is being made.
- All data is based on 1990 United States Census values for average work trip lengths.
- At 5% participation one in five will telecommute from telework centers; at 10% participation one in four; at 20% participation, one in three.

A summary of the findings from this report suggest:

With 5% of total Rhode Island commuters telecommuting once or twice a week, the potential exists for:

- ⇒ Saving 11 million VMT/year (0.2% of Total VMT; 0.7% of Work VMT)
- ⇒ Reducing cold starts by 4101/day.

With 10% of total Rhode Island commuters telecommuting once or twice a week, the potential exists for:

- ⇒ Saving 19 million VMT/year (0.4% of Total VMT; 1.4% of Work VMT)
- ⇒ Reducing cold starts by 7688/day.

With 20% of total Rhode Island commuters telecommuting once or twice a week, the potential exists for:

- ⇒ Saving 36 million VMT/year (0.8% of Total VMT; 2.6% of Work VMT)
- ⇒ Reducing cold starts by 13,737/day.

As mentioned throughout this report, telecommuting is no longer regarded by most as a panacea for solving urban highway congestion problems. The findings from this study further confirms this, where if telecommuting occurs even at a 20% participation rate, it has the potential of reducing Total VMT by less that one percent! This is due to several factors, including the growth of non-work related trips, the low incidence of telecommuting as a proportion of total work trips, and the limited applicability telecommuting has on the total labor market.

However, telecommuting can be an effective TDM strategy when part of an overall transportation demand management plan. The State of Rhode Island has several options in which to implement telecommuting as a transportation demand management strategy. The following are a number of steps Rhode Island should take in developing a telecommuting policy or program.

Form a State Committee on Telecommuting

Establish a committee comprised of public officials, transportation interest groups, and labor specialists to identify what commitments state officials and interest groups are willing to make to pursue telecommuting as a viable TDM strategy.

Identify Options

Determine whether there is support for the creation and adoption of a state telecommuting policy and to what extent. Gage the interest of private-sector employers in developing telecommuting as a work option and what prevents many of them from

doing so. Determine what time and resource investment the state is willing to make in pursuing telecommuting as a transportation alternative given its limited potential for impacting Total VMT.

Create and Implement the Program or Policy

Determine what program or policy will be the preferred strategy for Rhode Island; develop a method of pre- and post- program evaluation; design and implement the program or policy. Recommendations for a telecommuting implementation strategy in Rhode Island are to:

- ⇒ Establish a one-year telecommuting pilot program within one department of state government (i.e. Administration Department, Health Department, Education Department, etc.) If this pilot proves successful, it can then serve as a model for statewide adoption forming the basis of a state telecommuting policy.
- ⇒ Establish a telecommuting service program designed to aid the private sector in developing individual telecommuting programs tailored to individual business needs. In Rhode Island, the existing “Express Travel” program operated by the Rhode Island Public Transit Authority would be a good conduit for implementing such a program. At present, Express Travel serves to promote ridesharing to private sector employees throughout the state.

Either of these options would put Rhode Island on the right track to implementing telecommuting as a viable TDM strategy improving air quality and reducing highway congestion.

CONCLUSION

Business services, retailing/wholesaling and the banking/financial sectors are the primary industries where telecommuting would be most applicable (1). The telecommunications and healthcare industries also have a high potential for telecommuting. The Bureau of Labor Statistics forecast for employment growth 1992-2005 suggests that of 26 million new jobs being created, roughly half of these will be in the designated “30-largest growing industries.” And of those industries, 87% are “location dependent” jobs, like cashier, general office clerk, truck driver, waiter, etc. Subsequently, the impact telecommuting can have on aggregate commuter travel may be limited by the growth of location specific service sector employment (1).

The research on the potential for telecommuting remains lacking due in large part to the wide variety of scope and scale between telecommuting policies and programs, and the varying definitions as to who are “telecommuters.” Estimates on the levels and impacts of telecommuting are highly uncertain, though telecommuting does have the potential for providing some degree of transport-related public benefits, unless the emergence of latent travel demand diminish improvements in air quality and congestion. While the improvements might be relatively small, telecommuting is one method that can be used to develop a well-balanced transportation system, optimizing the use of existing infrastructure while providing options to the commuter, in this case as a means of working from home or a telework center.

Government agencies can play a significant role in facilitating and encouraging the adoption of telecommuting as a work option. This is especially the case in Rhode Island where the state is a leading employer. By developing a pilot telecommuting program with the ability to be launched statewide should the pilot be successful, Rhode Island can introduce this work alternative into the mainstream of state commuter options. Telecommuting can be an effective tool of transportation demand management but cannot be forced onto businesses by the state. In leading by example, it is hoped that the private sector may mimic this successful and beneficial option as an employee perk or as a means of tapping into underutilized labor pools.

Additional research and evaluation on telecommuting programs and policies needs to be performed, specifically clarifying the costs, benefits and impacts of telecommuting, with reference to the amount and nature of telecommuting occurring and expected to occur, direct costs and benefits, transportation impacts, land use impacts, barriers to telecommuting, its role in the transportation planning process, and the benefits of telework centers.

This report is intended to serve as an assessment guide as to what other states have been doing to implement telecommuting as a TDM strategy. With this guide, Rhode Island can make more informed decisions as to what direction they might pursue in advocating telecommuting as a work option throughout the state.

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APPENDIX

The following is a summary of telecommuting practices among major firms in the private sector (2).

Bank of America

The Bank of America, with its head office located in Charlotte, North Carolina, has 150,854 employees. The company believes that flexibility is the key to telecommuting. One of the driving forces behind offering telecommuting was their need to attract and retain the best and brightest associates. Acknowledging that its workers have lives outside of the company, the bank wanted to accommodate women employees who were taking maternity leave, but wished to continue working on a part-time basis. In recognition of its efforts, the Bank of America was named one of the 'top one hundred' companies by Working Mothers magazine for the past 12 years, and one of the 'top ten' since 1992. Offering telecommuting is one important indicator of its welcoming attitude toward families.

From its beginning, telecommuting within the company has greatly expanded, and has been available to the firm's employees for at least the past eight years. Decisions to decentralize the telecommuting program meant that individual telecommuting arrangements were determined at the local level, with managerial staff overseeing telecommuters who may work at home anywhere from one to five days a week. While this provides added flexibility, it makes the gathering of statistics difficult and other program indicators difficult, and no formal study of the program has yet been conducted. However, the company is convinced of the numerous benefits and says the program has led to increased productivity and morale; reduced absenteeism and of course, holding on to the talents of qualified people.

The company continues to allow telecommuting based on common sense and does not apply too many undue restrictions to employees' opportunities for telecommuting. It intends to expand the program by encouraging staff to creatively design, along with their managers, telecommuting plans based on individualized needs and preferences.

IBM

Based in Armonk, New York, IBM has 300,000 employees worldwide. Globally, 80,000 IBM employees (26.6%) telecommute at least 1 or 2 days a week. IBM has a clear vision of how telecommuting can work for them, and is convinced that telecommuting will continue to grow in the company.

When IBM made the decision to introduce telecommuting in 1993, its main objective was to cut costs by implementing a space-sharing concept. Employees were able to 'reserve' communal office space ('hoteling') for a specific time, and complete the rest of their work at home. This drastically reduced the need for office space and allowed for a net savings of \$56 million per year across the company. At the end of 1994, IBM opened the

doors to its entire U.S. sales force of 10,000 employees to telecommute. Within 2 years, it had negated the need for 2 million square feet of office space.

With high-tech workers expecting job flexibility, telecommuting has become something of a necessity at IBM. The company finds that telecommuting improves its ability to retain exemplary employees. A survey conducted in 1996 indicated that the company's telecommuters were the group who anticipated staying with the company the longest and showed the greatest job satisfaction.

The survey also revealed that 87% of IBM's telecommuters were 'more' to 'far more' productive because of telecommuting. The average IBM employee's personal productivity increased between 10 and 20% after telecommuting was implemented. This is noteworthy given that a productivity increase of only 0.1% was enough to make the telecommuting program cost-effective! Customers also voiced their approval for telecommuting as it allows them to see IBM salespeople more often and receive better service.

IBM employees in Canada, Europe, Asia and Latin America are also telecommuting more often. The company plans to continue global expansion of this work alternative.

Georgia Power

Georgia Power provides utilities for 1.8 million consumers in the Atlanta area, and employs 8,371 people. It is a subsidiary of Southern Company — an international energy company also based in Atlanta — which has \$36 billion in assets.

In the early 1990's, the City of Atlanta began promoting strategies to improve commuter efficiency. A high priority was given to the goal of improved air quality. Georgia Power responded by becoming one of the first companies in Atlanta to implement a formal telecommuting program. The program was unique given that telecommuting was not as commonplace in the southeastern states as it was elsewhere in the country. Since its official start in 1993 with 35 participating employees, the program has expanded to more than 300 participants.

In the year following the 1996 Olympic games — during which some 200,000 Atlantans telecommuted to reduce the city's heavy volume of traffic — Georgia Power conserved 1 million commuter miles, or 4,140 commuter miles per day!

Telecommuting has helped Georgia Power alleviate some of its office space problems, improve employee satisfaction and increase the productivity of hourly-paid employees, and even more so for salaried workers.

Although the company has experimented with satellite workstations, shared workspaces and home offices, the home-based telecommuting option has proven to be the most popular. Employees especially want to telecommute in the summer months when 'smog alert days' are declared.

Georgia Power anticipates that its telecommuting program will continue to grow as information technology's ability to interconnect people expands, and more and more employees are able to work from their own home.

Merrill Lynch

Based in New York, New York, Merrill Lynch Inc. is a financial services company that employs 70,700 people worldwide. Merrill Lynch's private client assets total more than \$1 trillion, and the firm operates one of the world's largest mutual funds groups. Since introducing its telecommuting program in 1996, approximately 3,500 of its employees work from home an average of 2 or 3 days a week. Technical workers were the first beneficiaries of the program, which expanded to include human resources, marketing, finance, and communications staff. The idea was to make Merrill Lynch the employer of choice amongst qualified personnel. The company is convinced that it seems to be working. Employee turnover has been reduced and personal satisfaction with the company has improved.

Employees who choose telecommuting must receive comprehensive training. Information sessions are necessary, with employees and managers participating separately, then as a group. Subsequently, employees spend two weeks in a simulation lab. There, they learn the technical foundations of telecommuting, including how to troubleshoot minor computer problems. It also allows workers to adapt to a new working culture, while providing them with step-by-step support as needed.

The program is very beneficial to the environment and Merrill Lynch estimates that its telecommuters make over 95,000 fewer trips per year.

Management continues to promote equal opportunities for advancement within the company for those who telecommute. Telecommuters exhibit greater independence and productivity and are some of the firm's highest achievers. The program emphasizes job productivity, not 'where' the job is done.

Merrill Lynch estimates that each telecommuter can save the company \$10,000 through lower absenteeism and fewer job-retention costs.

AT&T

Based in New York, New York, AT&T is a worldwide telecommunications organization that employs 151,000 people. It services 80 million customers and has annual revenues of \$64 billion.

Telecommuting has been advantageous to AT&T since its program started in 1992. A formal survey of 1,106 of its managers in 1999 illustrated the development and success of telecommuting within the company:

- 49% of all AT&T's managers telecommuted at least one day a month.

- 24% were telecommuting one day per week and 10% had full-time virtual offices.
- 68% said their productivity increased while telecommuting. Moreover, telecommuters worked one additional hour per day, equaling an additional 250 hours (6 work weeks) per year.
- 79% of AT&T managers surveyed reported higher satisfaction with their personal and family lives.
- 76% were happier with their jobs and 79% with their careers in general.
- 65% of managers agreed that telecommuting is a definite advantage for recruitment and retention.

Telecommuting can tip the scale in favor of the company who offers it. AT&T finds that telecommuting can also help the bottom line. Full-time telecommuters saved the company \$25 million in real estate costs in a year. Telecommuters also saved the company \$10,000 per year in job retention costs and reduced absenteeism. Sick or taking personal leave days becomes less of an issue when the employee can telecommute, since a full day off is not always necessary. Telecommuting also helped the company reduce its cost of absenteeism by some 63% per telecommuter because of their ability to work from home.

Last, but certainly not least, the company found that telecommuting yields many environment benefits. AT&T employees drove 87 million fewer miles in 1999. This resulted in 4.1 million fewer gallons of gasoline being consumed, along with 1.4 million fewer tons of carbon monoxide emitted.

Boeing

Boeing of Chicago, Illinois employs 187,000 workers and is the world's largest manufacturer of commercial jetliners and military aircraft, and the United States' largest NASA contractor.

The company's Virtual Office Program became a reality in 1996 with 150 participants, mostly engineers or computer professionals. The original pilot targeted some 50 telecommuters, but interest was so high that the company tripled the size of its pilot program.

During the pilot, employees preparing to telecommute attended a required two-hour orientation session on: software use, remote security issues and how to communicate in this new way of working. Weekly logs of work hours and work completed was also required. The first goal was to have people work at home for an average of 2 days per week.

After one year, Boeing evaluated its pilot program, gathering information from telecommuters, their managers, customers and fellow workers back at the office. This gave a more global picture of the impact telecommuting was having. The results showed that productivity increased between 15% and 30%. The quality of the work done improved even more. There was no turnover of telecommuting staff during this period,

unlike the higher rates among regular employees. No negative impact was reported for co-workers who remained in the office.

With a successful pilot, Boeing gave the go ahead for a company-wide launch of telecommuting. Since then, there has been a steady growth in the use of telecommuting and of other virtual office concepts. Currently several thousand Boeing employees telecommute at least one day per week.

The company feels that there is no 'one size fits all' way to telecommute, but it can work in different ways for many people. Management has certainly taken note of the positive way telecommuting has affected Boeing. There has been a shift from worrying about the time spent 'on the job', to the actual product and its quality. More innovative ideas are sure to come from Boeing, as their philosophy has embraced telecommuting as a great new way to do business.

Nortel Networks

Based in Brampton, Ontario, Nortel Networks is an international information technology company that has one of the strongest commitments to telecommuting. About 17% (almost 13,000 of its 75,000 world-wide staff) presently telecommute at least one day per week. Of these, 4,000 no longer need dedicated office space in a Nortel building.

The telecommuting program, called HOMEbase, was initiated in 1995. That year, 230 trial users became the first of an exploding number of telecommuters. The number of telecommuters grew to 1,100 in 1996; then to 2,300 in 1997; 4,000 in 1998; and doubled to 8,000 in 1999. By 2000, the number hit five digits with some 13,000 telecommuters!

Nortel understands that telecommuting is a 'win-win-win' situation for the company, its employees and for communities. People working at home mean more eyes for 'Neighborhood Watch' programs. Nortel telecommuters have also brought significant benefits for the environment, reducing travel by 50 million miles per year and eliminating 30 million pounds of pollution per year.

Surveys have consistently indicated that telecommuters are happier, healthier and less stressed. They are able to be more flexible with family time too. For example, parents working from home are able to see their children off to school in the morning and be there after school to greet them. Nortel employees are more likely to stay with the company longer if they telecommute.

Telecommuting has allowed Nortel to dramatically reduce its office space. The \$20 million a year it now saves on real estate costs is equivalent to two 20-story office buildings of 40,000 square feet per floor.

The company's goal is to wire every one of its knowledge worker's homes with high-speed access for telecommuting by the end of 2002.