THE STATE OF CALIFORNIA TELECOMMUTING PILOT PROJECT

FINAL REPORT
EXECUTIVE SUMMARY
JUNE 1990

JALA Associates, Inc.
971 Stonehill Lane
Los Angeles, CA, 90049-1412

Acknowledgments

EXECUTIVE SUMMARY

> ***Telecommuting:*** **sending the work to the worker instead of sending the worker to work; the partial or total substitution by telecommunications technology, possibly with the aid of computers, for the commute to and from work.**

The California Telecommuting Pilot Project was first planned in 1985. Starting in mid-1987, final selection began of participating State agencies, managers and telecommuters. Training of the first groups of telecommuters and supervisors occurred in January and May 1988. The project also included some individuals who had been telecommuting prior to the official start of the pilot project. The active implementation phase of the project ran until January, 1990. Participants in the project, as well as a Šcontrol‹ group of similar State employees, have been surveyed at intervals through the project (including intensive annual questionnaires) in order to test the impacts of telecommuting. A random survey was made in December, 1989, of more than 500 State employees who were information workers in order to test the applicability of the pilot project data to other areas of State government.

Rationale

There are many stakeholders in the Telecommuting Pilot Project. Stakeholders are individuals or groups who have an interest in, or are affected by, the outcomes of the project. Primary stakeholders[1] include the telecommuters themselves, their direct supervisors, their families and colleagues, the organizations *in* which they work, the organizations *with* which they work, organized labor groups and State government in general. Secondary stakeholders[2] include the communities in which telecommuters live and/or work, various agencies of government at the local, state and national levels (in the U.S. as well as in other countries), manufacturers and the distribution channels for information technologies and office equipment, the business community, the research community, consumer advocacy and other special interest groups, etc. Each of these stakeholders or stakeholder groups has a set of specific interests and priorities for judging the outcomes of the project. Often the interests of different groups coincide; at least some of the time they conflict.

Telecommuting, if it becomes widespread, can affect almost every aspect of contemporary life, from fundamental job patterns, to the physical structure of communities, to broad scale environmental changes such as global warming, to global economic competitiveness. Thus, we have attempted in the evaluation of this project to address as many as possible of the major issues affected by telecommuting.

This attempt was necessarily moderated by the constraints of budget and time—and the patience of the telecommuters and their supervisors. Budget and time constraints dictated investigation by questionnaire rather than the more expensive interview process. Respondents' patience limits constrained the length of the questionnaires (the final, 'abridged' questionnaire contained 466 items) and the frequency of their administration. Considering the time required to complete the questionnaires, the response rate of 100% in many of the

---

[1]Those who are or can be immediately or directly affected by telecommuting.

[2]Those who have a broad or indirect interest in some of the impacts, such as air quality, energy use, zoning, the economy, management techniques, etc.

agencies is quite gratifying. In addition to the annual round of questionnaires, the participants and their driving age family members were asked to complete logs of their automobile use for periods of three consecutive days, once before telecommuting began and at the end of the first year of telecommuting.

The Basics

There are presently about 150 telecommuters participating in the project, mostly located in northern California, mostly from 6 of the 14 participating State agencies:[3] California Energy Commission, California Youth Authority, Department of General Services, Department of Social Services, Franchise Tax Board, and the Public Utilities Commission. The Public Utilities Commission telecommuters live primarily in the San Francisco bay area, most of the rest of the telecommuters live in the Sacramento area. In January, 1990 another group of telecommuters from the Department of Justice was added, all of whom live in or near Los Angeles. However, test results from that group are not covered in this report.

Most (72%) of the telecommuters consider themselves to be professionals, with jobs ranging from accountant to researcher and including administrative law judges, lawyers, policy analysts and appraisers. Secretaries and clerical workers constitute 3% of the telecommuters, individuals who are primarily managers form another 3%, and those who consider themselves to be both managers and professionals make up 18% of the group. The average telecommuter is 41 years old, has worked for the State 14 years and 64% are male. The control group differs slightly from these figures, averaging 40 years old, with 47% males.

The median commute distance for the telecommuters is 20 miles, covered in 40 minutes (averaging 30 mph). The controls' median commute is 12 miles, covered in 30 minutes (averaging 24 mph). One telecommuter's 'commute' is 210 miles, while the most distant control lives 200 miles from work. Almost all of the telecommuters work from home only part of the time, spending the rest of the time in their traditional office. The average in December, 1989 was 1.5 full days and 0.2 partial days per week at home, as compared with 1.2 and 0.3 days per week, respectively, the previous year.

Exactly half of the telecommuters used their own personal computers when they worked at home and only 23% didn't own a computer when we completed the mid-term survey of the participants. By December, 1989, PC ownership had climbed to 84%, with 58% of the telecommuters using their PCs for work. Ninety percent of the telecommuters own their own homes (single family detached structures), the average size of which is 1756 square feet— 134 square feet of which is used generally, and 69 square feet exclusively, for telecommuting. That is, their home offices are about the same size as their current downtown offices.

Results and Lessons Learned

The project has met or exceeded all of its key success criteria[4]:

- Telecommuter work effectiveness has fulfilled or exceeded expectations.

- Telecommuting enhances the quality of work life for telecommuters, including those with disabilities.

---

[3]An additional 7 agencies participated in some or all of the selection and training processes but never began telecommuting.

[4]Details are in the section of the full report entitled: *Definitions and Objectives*.

- Results-oriented management techniques have proven to be effective tool for telecommuting—as well as for non-telecommuters.

- The techniques used for selection, training and evaluation of telecommuters are successful.

- Telecommuting has been shown to have significant potential for reducing traffic congestion, air pollution and energy use.

- Equitable means have been developed for sharing office space and reducing total space requirements (although these have not been fully tested yet).

As expected, many telecommuters experienced 'break-in' strains for a few months as they became acclimated to this new way of working. We expected stable conditions to reign by the end of the first year. Interestingly, effectiveness evaluations and quality-of-life indicators continued to improve after the first year.

Our in-person discussions and our questionnaire surveys and impact analyses during the implementation period lead us to the following key conclusions concerning the ***preconditions to telecommuting***.

1. **Top-Down Support Is Vital**. A prerequisite to successful participation of an organization in any innovation is the support of senior management. It is also generally true that the agencies with the largest number of telecommuters (in proportion to their size) have the most active project representatives—or is it vice versa?.

2. **Senior Management Support, Although Necessary, Is Not Sufficient.** An active Šchampion‹ is needed in each agency to spark participation through the startup period. This and the previous finding underscores our contention that:

3. **Telecommuters and Their Supervisors Must Be Volunteers**. If either party feels forced to telecommute—or to supervise telecommuters, performance tends to suffer. This implies that telecommuting must be a management option.

4. **Screening is Important**. Not all State employees can telecommute effectively, either because of the requirements of their jobs or because of personal and/or work-social considerations.

5. **Training Is the Key**. We see significantly higher performance results when both the telecommuters and their direct supervisors have received telecommuting-specific training before telecommuting began.

6. **Major Capital Investments Are Not Necessary**. Few, if any, of the participating agencies were required to make unplanned expenditures for computers or other telecommuting-specific technology. Often, where telecommuters worked frequently from home, their State-provided computer was moved from their downtown office to their homes. Many telecommuters either do not use computers at home or already own suitable machines.

   - Nevertheless, computers will be an important part of telecommuting in coming years. It is important to begin developing policies for these uses.

   - Further, no satellite telecommuting office has yet been established, although we have already selected and trained a set of candidate satellite office telecommuters—and desirable satellite office locations; this is partially a result of State facilities budget restrictions.

We can amplify the conclusions stated earlier: when those preconditions are satisfied, as they were for most of the participants, the following results can be expected.

- **Telecommuting More Than Pays Its Way**. There are a number of positive impacts of telecommuting. The average change in effectiveness of telecommuters is greater than that of the control group (a group chosen to otherwise match the characteristics of the telecommuters as closely as possible).

  Telecommuters use less office and parking space downtown.

  Telecommuting has been found to be very useful for retaining the services of mothers during maternity leaves, as well as keeping or attracting employees with scarce expertise or talents.

  The consequence of these and related impacts is that the pilot project, including all the extra planning and training, paid for itself early in 1989. Since those start-up costs are now covered, the State can expect to make a surplus on the continuing telecommuters. Benefit-to-cost ratios could reach more than 20:1 if the experience to date continues to be valid in future years[5].

  There were also non-recurring benefits, not counted on our estimates. For example, telecommuters in the Public Utilities Commission were able to continue working immediately after the 1989 Loma Prieta earthquake even though the PUC was officially shut down for the rest of that week.

- **There Are Societal Benefits As Well**. A number of benefits have been demonstrated to date that can not be measured easily in dollar terms. Disabled telecommuters find the strain of 'getting to' their jobs significantly eased.

  Telecommuters generally experienced more positive changes in their personal and their work relationships than did the members of the control group.

  Although some automobile trips are taken by telecommuters during their work-at-home days, there are net savings in automobile use—household-wide—over and above the direct telecommuting-induced savings. The energy saved by six or seven telecommuters in one year is equivalent to the average US annual household energy consumption. If large numbers of people were to telecommute there would be proportionate reductions in traffic congestion and associated air pollution.

---

[5]The estimated actual annual benefit-to-cost ratios at the mid-term and final survey points were 0.9 and 8.0, respectively. Both of these ratios were heavily influenced by the non-recurring administrative costs of the pilot project. Our 1985 estimate was that the benefit-to-cost ratio at the end of the second year would be 3.2.

- **But There Are Restrictions and Possible Side Effects**. Some jobs are not 'telecommutable', nor are some individual workers'—or their supervisors'— temperaments. Our random survey of State information workers leads us to conclude that about 15% of them could not telecommute at all at this time, because of job constraints, and about 30% have jobs suitable for some home-based telecommuting, with the remainder as candidates for satellite-office telecommuting.

  In the cases where some of the preconditions were not met, such as inadequate selection or incomplete training, results tended to be poor or negative.

Telecommuting was a statistically significant factor in the decision by 3% of the telecommuters to move farther from work. Clearly, other factors, such as affordable housing, are also major influences, probably the dominant ones. Nevertheless, telecommuting could be perceived as having possible negative long term effects on travel patterns—unless more emphasis is put on establishing regional telecommuting centers in or near areas of affordable housing.

There may be negative impacts on work-group performance if telecommuters are not readily accessible face-to-face (although we have little evidence—and some counter-evidence—of this to date).

Recommendations

We feel that the results to date support expansion of telecommuting to other State agencies. We further recommend that:

- **A State Telecommuting Advisory Agency Should Be Established**. Because successful telecommuting does require careful planning, selection, suitable information technology aids and training it is important that agencies new to telecommuting be given appropriate support in their start-up efforts. This can best be accomplished by a relatively small group of experts who would be available as advisors to the State agencies and personnel, help customize telecommuting to their particular cultures, help coordinate policy influenced by the impacts of telecommuting, and generally help improve the telecommuting process in State government. Our recommendation is that this task should be given to the Department of General Services. The Department should take a leadership role in supporting agencies in their efforts to establish satellites and in coordinating joint efforts in facility sharing.

- **More Effort Should Be Given to Establishing Satellite Centers**. Many telecommuters were excluded from the project because their work duties required them to be in an office but who otherwise could function as telecommuters. Had satellite centers been available during the project period this additional group would have been part of the project. Additionally in areas around Los Angeles, for example, steep gains in housing prices have forced many information workers into moving great distances from their jobs. Satellite office telecommuting could be a major improvement for these people. Finally, employees whose jobs are suitable for home-based telecommuting constitute a minority of the potential telecommuters. More than half of the State employees tested might be able to work at satellite offices. We recommend that pilot satellite offices be established in both northern and southern California as soon as possible.

- **Bilevel Volunteerism Should Be A Requirement**. It is our firm belief that the participation decision priorities must be top down; that is, from the agency director to the specific telemanager. A 'no'—but not a 'yes'—at any point in this chain must be able to override contrary votes among the downward links. A manager must be able to terminate telecommuting for any one of his/her subordinates who does not live up to their mutually agreed upon performance goals.

- **Pre-telecommuting Screening and Training Should Be Mandatory**. We recommend that **no** further telecommuting by State employees be allowed unless the telecommuters and telemanagers are adequately tested and provided with pre-telecommuting training. Also, each agency should have a telecommuting Šchampion‹, who is at a relatively high level in the organization and who is an active proponent of telecommuting, to act as the agency coordinator of telecommuting development.

- **Continuing Evaluation Data Are Needed**. As telecommuting expands to other agencies, or within agencies already in the project, it is vital to keep track of the impacts during the learning and adjusting process. We recommend that new agencies, as they develop their own pilot projects, strongly urge their participants to comply with reasonable evaluation survey requests. It is also important to test the satellite office concept since many more State employees have jobs that require them to be in an office setting. Further, annual surveys for all telecommuting agencies would be desirable, at least for a few years, to help detect any undesirable long term trends (such as increases in commuting distances).

- **A Set of Uniform Guidelines Should Be Established**. With the aim of incorporating these recommendations and minimizing wheel reinvention, a set of guidelines should be established that apply to each State agency, providing a core set of operating policies and procedures but leaving room for each agency to develop additional rules for telecommuting adapted to their own operating conditions. An outline example is in an Appendix to the full report.

6