Agency Name	Sub-Agency Name	Population	3 or more days per week	1-2 days per week	At least 1 day per month	Total Teleworkers 2008	Total Teleworkers 2007
	US Immigration and Customs Enforcement	18,783	0	0	0	0	74
	US Secret Service	6,627	0	3	0	3	3
Department of Homeland Security Total		**177,961**	**252**	**613**	**515**	**1,380**	**1,310**
Department of Housing and Urban Development	Administration	666	6	8	5	19	16
	Chief Financial Officer	212	3	31	0	34	30
	Chief Information Officer	253	0	13	4	17	1
	Chief Procurement Officer	119	1	20	1	22	11
	Community Planning and Development	779	8	188	11	207	214
	Congressional and Intergovernmental Relations	0	0	0	0	0	NR
	Departmental Equal Employment Opportunity	22	0	3	1	4	1
	Departmental Operations and Coordination	94	5	33	0	38	32
	Fair Housing and Equal Opportunity	582	15	156	8	179	192
	Field Policy and Management	350	27	20	0	47	39
	General Counsel	660	10	142	0	152	121
	Government National Mortgage Association	59	0	3	1	4	3
	Healthy Homes and Lead Hazard Control	56	0	22	0	22	18
	Housing	3,223	70	518	49	637	623
	Inspector General	NR	NR	NR	NR	0	291
	Labor Relations	NR	NR	NR	NR	0	NR
	Policy Development and Research	124	0	0	0	0	10
	Public Affairs	0	0	0	0	0	0
	Public and Indian Housing	1,449	80	402	64	745	487
	Secretary and Deputy Secretary	53	0	0	0	0	NR

Agency Name	Sub-Agency Name	Population	3 or more days per week	1-2 days per week	At least 1 day per month	Total Teleworkers 2008	Total Teleworkers 2007
Department of Housing and Urban Development Total		**8,701**	**225**	**1,559**	**144**	**1,928**	**2,089**
Department of Interior	Bureau of Indian Affairs	9,028	NR	NR	NR	NR	2
	Bureau of Land Management	9,715	53	89	74	216	212
	Bureau of Reclamation	5,197	31	70	198	299	373
	Minerals Management Service	1,614	11	8	16	35	301
	National Business Center	1,223	17	16	20	53	40
	National Park Service	18,049	111	160	167	438	373
	Office of Surface Mining	530	NR	NR	NR	0	73
	Office of the Inspector General	246	5	18	40	63	37
	Office of the Secretary	916	32	210	11	253	26
	Office of the Solicitor	413	32	12	19	63	156
	US Fish and Wildlife Service	8,573	107	275	100	482	281
	US Geological Survey	8,574	1,289	4,530	3,038	8,857	4,750
Department of Interior Total		**64,078**	**1,688**	**5,388**	**3,683**	**10,759**	**6,624**
Department of Justice	Alcohol, Tobacco, Firearms and Explosives	5,035	363	36	103	502	504
	Antitrust Division	580	0	5	14	19	52
	Bureau of Prisons/Federal Prison System	36,446	55	155	0	210	113
	Civil Division	1,298	0	129	11	140	147
	Civil Rights Division	652	2	32	5	39	42
	Community Oriented Policing Service	1,040	1	18	2	21	26
	Criminal Division	690	2	8	5	15	7
	Drug Enforcement Administration	9,201	1	17	5	23	59
	Environment and Natural Resources Division	669	0	58	5	63	62
	Exec Office of US Attorneys	11,262	9	14	12	35	1,362

Agency Name	Sub-Agency Name	Population	3 or more days per week	1-2 days per week	At least 1 day per month	Total Teleworkers 2008	Total Teleworkers 2007
	Executive Office for Immigration Review	1,228	1	101	0	102	88
	Federal Bureau of Investigation	31,600	22	24	0	46	35
	Office of Justice Programs	660	0	80	81	161	126
	Office of the Inspector General	405	2	13	118	133	15
	Offices Boards and Divisions	881	7	63	75	145	133
	Tax Division	489	1	22	15	38	24
	US Marshals Service	4,841	10	14	18	42	33
	US Trustee Program	1,255	19	0	0	19	20
Department of Justice Total		**108,232**	**495**	**789**	**469**	**1,753**	**2,848**
Department of Labor	Adjudicatory Boards	112	2	28	12	42	0
	Bureau of International Labor Affairs	81	0	1	7	8	6
	Bureau of Labor Statistics	2,363	21	92	119	232	234
	Employee Benefits Security Administration	859	9	51	74	134	151
	Employment and Training Administration	924	4	48	74	126	107
	Employment Standards Administration	3,985	68	155	216	439	341
	Mine Safety and Health Administration	2,372	6	14	25	45	42
	Occupational Safety and Health Administration	2,070	28	50	145	223	231
	Office of Administrative Law Judges	141	0	1	0	1	0
	Office of Disability Employment Policy	44	0	1	4	5	2
	Office of Public Affairs	57	0	1	0	1	NR
	Office of the Assistant Secretary for Administration and Management	661	7	15	62	84	66
	Office of the Assistant Secretary for Policy	35	0	4	5	9	8

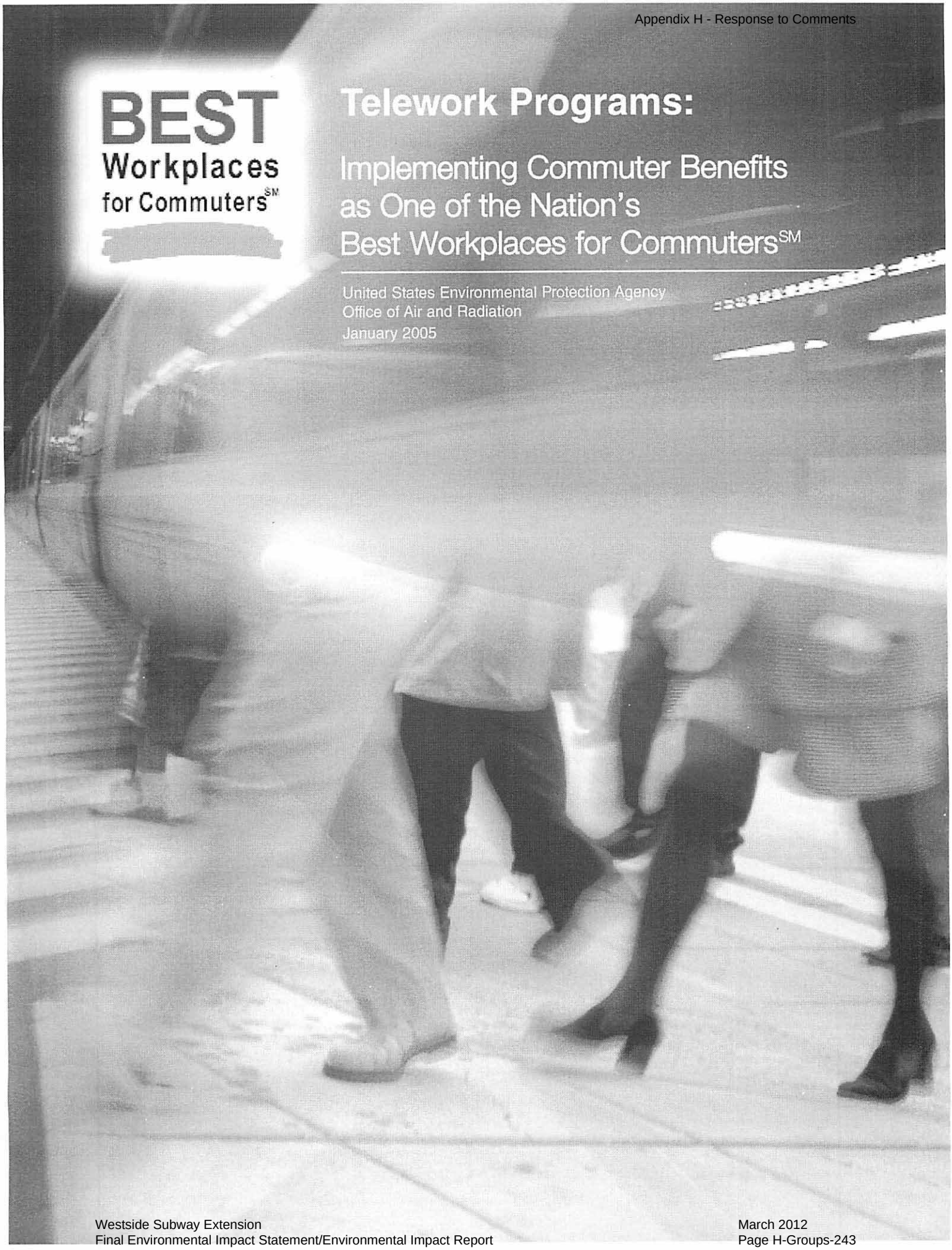
Agency Name	Sub-Agency Name	Population	3 or more days per week	1-2 days per week	At least 1 day per month	Total Teleworkers 2008	Total Teleworkers 2007
	Office of the Chief Financial Officer	88	0	1	1	2	2
	Office of the Inspector General	403	3	9	44	56	37
	Office of the Secretary	258	0	2	22	24	60
	Office of the Solicitor	600	3	55	70	128	116
	Veterans Employment and Training Services	239	1	2	1	4	9
	Women's Bureau	53	0	4	3	7	7
Department of Labor Total		**15,345**	**152**	**534**	**884**	**1,570**	**1,419**
Department of Transportation	Federal Aviation Administration	45,729	169	493	1,270	1,932	1,631
	Federal Highway Administration	2,883	195	239	1,435	1,869	773
	Federal Motor Carrier Safety Administration	1,059	2	144	66	212	137
	Federal Railroad Administration	817	343	107	189	639	526
	Federal Transit Administration	506	24	210	0	234	135
	Maritime Administration	763	29	134	85	248	141
	National Highway Traffic Safety Administration	606	8	110	393	511	128
	Office of Inspector General	407	0	10	75	85	189
	Office of Secretary of Transportation	621	30	19	118	167	200
	Pipeline/Hazardous Materials Safety Administration	360	29	171	131	331	232
	Research and Innovative Technology Administration	696	61	189	126	376	341
	St. Lawrence Seaway Dev Corp	136	0	7	11	18	11
	Surface Transportation Board	144	2	80	1	83	67
Department of Transportation Total		**54,727**	**892**	**1,913**	**3,900**	**6,705**	**4,511**

Department of Treasury	Alcohol and Tobacco Tax and Trade Bureau	527	137	111	89	337	302
	Bureau of Engraving and Printing	1,958	5	19	36	60	NR
	Bureau of Public Debt	1,977	1	27	0	28	20
	Departmental Offices	1,450	45	15	16	76	31
	Financial Crimes Enforcement Network	297	0	9	NR	9	35
	Financial Management Service	1,916	10	134	0	144	135
	Internal Revenue Service	82,741	955	1357	728	3,040	3,097
	Office of Comptroller of Currency	3,131	0	17	253	270	1,660
	Office of Inspector General	107	0	14	22	36	9
	Office of Inspector General for Tax Administration	790	283	80	275	638	683
	Office of Thrift Supervision	1,074	0	645	115	760	849
	US Mint	1,869	3	25	18	46	40
Department of Treasury Total		**97,837**	**1,439**	**2,453**	**1,552**	**5,444**	**6,861**

UNITED STATES
OFFICE OF PERSONNEL MANAGEMENT
1900 E Street, NW
Washington, DC 20415

SHRP-09-17138

Item 4.
BEST Workplaces for Commuters, Telework Programs, Implementing Commuter Benefits as One of the Nation's Best Workplaces for Commuters, United States Environmental Protection Agency, January 2005


BEST
Workplaces
for Commuters℠
Telework Programs:
Implementing Commuter Benefits
as One of the Nation's
Best Workplaces for Commuters℠
United States Environmental Protection Agency
Office of Air and Radiation
January 2005

Telework
Implementing Commuter Benefits as One of the Nation's Best Workplaces for Commuters℠

- Telework is an arrangement between employers and employees in which employees work part- or full-time from alternate locations, such as their homes or telework centers.
- Telework has a number of important benefits for employers: it can serve as a valuable recruitment and retention tool, increase employee morale and productivity, and reduce costs through office space and parking savings.
- Current estimates show that there are approximately 44 million teleworkers in the United States.[1]
- Studies have shown that teleworkers tend to drive less on the days they telework, which reduces both road congestion and air pollution.
- To be recognized as one of the Best Workplaces for Commuters℠ (BWC) program, employers must offer at least one of three primary commuter benefits to employees. One such option is to implement a telework program that reduces overall commute trips by at least 6 percent on a monthly basis (the other two are subsidizing transit or vanpool passes and cash in lieu of free parking [parking cashout]).

As of October 1, 2007, Best Workplaces for Commuters℠ is no longer administered by the U.S. Environmental Protection Agency and the U.S. Department of Transportation. From that date forward, the program is administered by organizations that have decided to sustain Best Workplaces for Commuters. Information on sustaining communities and organizations will be available on the www.epa.gov Web site.

[1] *www.benefitnews.com/detail.cfm?id=6491&terms=|00||ar||96||95||telework||eb||nw2||01||99||nw||97||98|*

This document is one in a series of briefing papers designed to help employers implement commuter benefits to achieve the Best Workplaces for Commuters℠ designation.

The U.S. Environmental Protection Agency (EPA) and the U.S. Department of Transportation (DOT) established a voluntary National Standard of Excellence for employer-provided commuter benefits. Commuter benefits help American workers get to and from work in ways that cut air pollution and global warming pollution, improve public health, improve employee recruiting and retention, improve employee job satisfaction, and reduce expenses and taxes for employers and employees. Employers that agree to meet National Standard of Excellence earn the Best Workplaces for Commuters℠ designation and agree to:

- ▶ Centralize commute options information so that it is easy for employees to access and use.
- ▶ Promote the availability of commuter benefits to employees.
- ▶ Provide access to an emergency ride home (ERH) program.
- ▶ Provide one or more of the following primary commuter benefits:
  - ✓ Vanpool or transit subsidy of at least $30 per month.
  - ✓ Cash in lieu of free parking worth at least $30 per month.
  - ✓ Telework program that reduces commute trips by at least 6 percent on a monthly basis.
  - ✓ Other option proposed by employer and agreed to by the organization that offers the BWC designation. These services must reduce the rate at which employees drive to work alone and be perceived by employees as a significant workplace benefit.
- ▶ Provide three or more of the following additional commuter benefits:
  - ✓ Active membership in a Transportation Management Association (TMA) or participation in a voluntary regional air quality management program (e.g., Spare the Air, Air Awareness, SEQL, Clean Air Coalition) or another employer-based commuter program.
  - ✓ Active membership in a local ozone awareness program, in which you agree to notify employees of expected poor air quality and suggest ways that they might minimize polluting behaviors.
  - ✓ Ridesharing or carpool matching, either in-house or through a local or regional agency.
  - ✓ Pre-tax transit benefits.
  - ✓ Pre-tax vanpool benefits.
  - ✓ Parking cash out less than $30 per month or less than 75 percent of the actual parking benefit.
  - ✓ Shuttles from transit stations, either employer-provided or through a local TMA or similar service provider.
  - ✓ Provision of intelligent (i.e., real-time) commuting information.
  - ✓ Preferred parking for carpools and vanpools.
  - ✓ Reduced parking costs for carpools and vanpools.
  - ✓ Employer-run vanpools or subscription bus programs.
  - ✓ Employer-assisted vanpools.
  - ✓ Employer-provided membership in a carsharing program (visit <www.carsharing.net> to learn more).
  - ✓ Secure bicycle parking, showers, and lockers.
  - ✓ Electric bicycle recharging stations.
  - ✓ Employee commuting awards programs.
  - ✓ Compressed work schedules.
  - ✓ Telework (less than 6 percent of commute trips on a monthly basis).
  - ✓ Lunchtime shuttle.
  - ✓ Proximate commute (where employees work at locations closer to their homes).
  - ✓ Incentives to encourage employees to live closer to work.
  - ✓ Incentives to encourage employees to use alternative transportation (e.g., additional vacation time).
  - ✓ On-site amenities (e.g., convenience mart, dry cleaning, etc.).
  - ✓ Concierge services.
  - ✓ Other options proposed by employers.
- ▶ Employers commit to ensuring that within 18 months of applying, at least 14 percent of commute trips are taken using an alternative mode.

Disclaimer

EPA developed this briefing as a service to employers participating in Best Workplaces for Commuters℠. Information about private service providers is intended for informational purposes and does not imply endorsement by EPA or the federal government.

The information presented here does not constitute official tax guidance or a ruling by the U.S. government. Taxpayers are urged to consult with the Internal Revenue Service of the U.S. Department of Treasury or a tax professional for specific guidance related to the federal tax law.

Contents

Telework: A Summary

Telework is a workplace arrangement in which employees work part- or full-time away from the primary workplace. Most teleworkers work from their homes, but a smaller number work from "telecenters": offices with communications access to the main workplace, but closer to the employee's home[1]. Telework is generally based on exchanging information via telephone and computer.

Telework has increased as communications technology improves and becomes cheaper, and as employers and employees have become more comfortable with it. However, many employees and employers have also begun to regard telework as having a positive impact on employees by reducing long commutes. As a result, in addition to providing emissions benefits, telework is also a valuable recruitment and retention tool for employers.

Brief History

Telework is linked to the proliferation and advance of telecommunications technology. Until the 1980s, most office arrangements required employees to be physically present to perform their jobs. However, with the ability to exchange documents over phone lines via modems, many jobs (in whole or in part) can be performed from remote sites. Such tasks as entering and analyzing data, writing and editing documents, and computer programming are no longer tied to specific locations. Telework has increased dramatically over the past several decades for several reasons: advances in computer and remote access technology; longer commutes; and the desire of employees to spend more time with family. However, the actual number of teleworkers is difficult to measure accurately because of varying definitions and the small sample size of many surveys. Current estimates from *Benefit News* put the number of U.S. teleworkers at approximately 44 million[2]. In 2003, IDC put the total number of home-based offices at 32.5 million and forecast to reach 34.6 million by 2007[3].

Employer Benefits

Telework can assist a business in several key areas.

Recruiting and Retention

Many employers look at telework primarily as an employee benefit, not a cost- or space-saving measure. Related literature contains significant anecdotal evidence that employees seek out jobs and firms that offer telework options.

In addition, many employers have found that telework allows them to retain employees who would otherwise leave for personal reasons, such as moving out of the area or the birth of a child. Some companies have come to view telework options as important components of their competitive strategies for attracting and retaining valuable talent. For example, a Connecticut-based insurance company arranged for one of its most productive software programmers to telework from Canada. The company calculated it was less costly to pay for the employee's regular office visits and for installation of the needed technology in the worker's home than to lose the programmer's business knowledge and creativity.

Moreover, telework has no geographic limitations for finding employees. This makes the quality of the applicant pool much stronger for an employer who offers telework as opposed to an employer who does not offer telework and is limited to a regional and less diverse selection of employees. The competitive advantage of offering commuter benefits, such as telework, not only improves employee retention levels, but also tends to improve employee talent levels.

Cost Savings

Many companies find that telework saves money in the long run because cost savings can be achieved in a number of areas:

- Reduced rent costs if teleworking employees use less office space
- Reduced costs due to employee turnover

Information from Michael J. Dziak, a 10-year veteran telework consultant and general manager of the Metro Atlanta Telecommuting Advisory Council (MATAC), indicates that in 2001 about $14,000 could be saved per year per teleworking employee.[4]

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[1] *Telework does not include the following employment arrangements: home-based businesses (small companies with their main offices co-located in a residence), work in branch offices, and employment in which the regular work location is not fixed (for example, truck drivers and airplane pilots would not be considered teleworkers).*

[2] *http://www.benefitnews.com/detail.cfm?id=6491&terms=|00||ar||96||95||telework||eb||nw2||01||99||nw||97||9|*

[3] *http://www.marketresearch.com/map/prod/1008711.html*

[4] *http://www.bizjournals.com/atlanta/stories/2001/10/15/focus8.html*

Another powerful driver spurring the use of telework is potential real estate cost savings from housing fewer employees on-site. These savings easily offset the expense of equipping teleworkers with hardware, software, and other needed supplies.

Increased Productivity

Many teleworkers report higher productivity while working from home due to reduced workplace distractions. In addition, use of sick leave tends to decline when employees telework. This may be due to several reasons: employees are less likely to call in sick for invalid reasons, less likely to need time off for doctor's appointments, and less likely to need time off because of a sick child.

Employees will also frequently avoid missing days of work due to inclement weather conditions.

Benefits at Individual Employment Sites

Employers that institute telework programs may be able to reduce parking needs at their workplace if the number or percentage of teleworkers is sufficiently high.

Tax Considerations

There are currently no federal tax incentives or implications for establishing a formal telework program. Legislation introduced at the federal level would allow a $500 tax credit for employers or employees who begin teleworking over 75 days per year. Rep. Frank Wolf (R-VA) introduced a bill in March 2001 (a February 2000 introduction of identical legislation died in committee), and Sen. Rick Santorum (R-PA) introduced companion legislation in the Senate. Either the employer or the employee, depending on who incurred the expense of setting up a home office, could take the tax credit.

For tax purposes, teleworkers are considered regular employees (not persons running a business out of a home). If a teleworking employee lives in a different state than the employer's main office, s/he should consult a tax expert to determine applicable state tax laws. Generally, most teleworkers will not be eligible to claim the home-based office tax deduction. According to IRS regulations, in order for a teleworker's home office to qualify for the home office deduction, it must be regularly and exclusively used for business, and the arrangement must be at the employer's request.

At the state level, Oregon allows employers to take a tax credit of 35 percent for investments made in telework (i.e., costs of purchasing and installing office and computer equipment). The credit, which employers must be approved for in advance of their investments, is spread over a five-year period: 10 percent in the first two years, and five percent annually for the next three years. Teleworkers must work from their home or telework center at least 45 days per year for their employer's program to be eligible. A more complete list of telework state incentives can be found at the following address: <www.nctr.usf.edu/clearinghouse/statestatutes.htm>.

Employee Benefits

Employees generally react very positively to telework programs. The main benefit is commute time savings, which can amount to several hours per day or more. Employees can spend this extra time with their families or on other personal needs.

Employees also enjoy the following benefits:

- **Decreased stress.** Many drivers find solo commutes in heavy traffic stressful. Telework allows them to avoid traffic.
- **Reduced costs.** Teleworkers save on gas, depreciation, and general wear and tear on their vehicles.
- **Community life.** Telework allows people to find a healthier balance between work and social life. Studies have shown that teleworkers find it easier to get involved in local community activities[5].
- **Time Savings.** According to the Bureau of Transportation Statistics, the average commute for American workers is approximately 26 minutes[6]. The average teleworker avoids going to work 1-2 days per week. Therefore, the average time saved by a teleworker is 45 to 90 hours per year.

When Telework Makes Sense

Many factors affect employers' ability to offer telework as well as the effectiveness of telework programs. While the following discussion is not exhaustive, it covers the main factors.

Employers with Information Workers

Only employees who can perform their tasks away from the main workplace can telework. The U.S. Office of Personnel Management (OPM) suggests the following types of jobs as most suitable for telework (OPM, 2001):

- Jobs that involve thinking and writing
- Data analysis
- Writing decisions or reports
- Telephone intensive tasks
- Computer-oriented tasks (data entry, Web site design, word processing, programming)
- Payroll transaction processing
- Analysis-type work (investigators, program analysts, financial analysts)
- Engineers
- Architects
- Researchers
- Customer service jobs

[5] *http://www.att.com/telework/article_library/sustainable.html*
[6] *http://www.bts.gov/publications/omnistats/volume_03_issue_04/html/entire.html*

Offices with high concentrations of the types of workers listed above are good candidates for telework programs. On the other hand, jobs that require face-to-face communication, access to on-site materials or files (including confidential material), and site-specific occupations are not as amenable to telework.

Within companies whose primary occupations are not right for telework, there may still be positions with the potential to telework (for example, a large construction company with an in-house human resources department might allow an employee in the payroll section to telework). There may also be positions whose duties would be more appropriate for teleworking on a part-time basis. In general, however, telework has the most promise in offices with large concentrations of information workers, whose outputs depend largely on computer access.

Established Employees

Because telework requires supervising employees not at the workplace, it tends to work better for employers who are already assured of their employees' work quality and reliability. Most employers are reluctant to allow new employees to telework because of concerns that they may not perform well or that they will not become sufficiently acquainted with the company's internal structure and culture. Similarly, at a very new company, the importance of face-to-face interaction among all employees may outweigh the potential benefits of telework.

Employees with Personal Needs

Employers may use telework to retain established employees who would otherwise resign for personal reasons (moving, child, or eldercare issues). In addition, some employers have found that disabled employees can be accommodated through telework when physical access issues at the worksite are problematic.

Competitiveness in a Crowded Employment Field

Some companies view telework as primarily an employee benefit, rather than a transportation strategy or means to reduce costs, and promote it to prospective and current employees as such. However, employers should be careful when promoting their telework program as an "employee benefit". Since not all positions are suitable for telework, they may wish to simply publicize the telework program or arrangement, so as to minimize the perception that telework will be available to all employees.

Implementation Issues and Costs

This section addresses a variety of implementation issues, including employee supervision and evaluation.

Eligibility

An employer should establish guidelines for determining which employees can telework.

There may be two components to eligibility:

- which activities within a company are suitable for telework, and
- which employees have the job skills that make them eligible to telework

Even if a particular activity or position lends itself to telework, the employee may not be allowed to telework until s/he is properly trained or obtains a certification. Telework guidelines and policies should address both issues.

Amount of Time Spent Teleworking

Few teleworkers spend their entire workweek off-site. The average number of days teleworkers spent working off-site is one to two per week. While this may vary with the type of work performed, most firms find that full-time telework is far less common than occasional telework.

Telework Program Turnover

If programs are solidly implemented and teleworkers selected well, telework programs are generally successful. However, a few studies suggest that some employees encounter problems with the arrangement and return to working on-site full-time.

Most reasons for this turnover were job-related (e.g., a change in position or request from supervisor to return to a regular office schedule), rather than personal dissatisfaction with the arrangement. Also, turnover may be higher at telecenters than for home-based teleworkers, and some telecenter employees find it is just as easy to work at home.

Costs

Employers sometimes pay the costs of telework arrangements for their employees. Costs might include computer equipment, network access (including internet, intranet, and/or company servers), additional phone lines, fax machines and printers, and in some limited cases general office equipment (ergonomic chairs, files, cabinets, etc).

Costs to implement a telework program will vary dramatically depending on the type of equipment currently owned by the employer. The average investment per employee ranges from $1,000 to $5,000, with an additional $1,000 operating in costs each year.

JALA International's general estimate claims that the average employer will spend $5,500 establishing each individual employee as a teleworker (estimate available at <www.jala.com/homecba.php>). Most costs are depreciable, so the bottom-line costs will be less.

In addition, employers should consider liability issues, such as responsibility for lost data, theft of equipment, or damage due to power spikes, and insure teleworkers appropriately. There is a small field of telework law that considers the circumstances under which employers could be held liable for workplace injuries incurred in the employee's home.

Cost Savings

Although implementing a telework program requires investment, many find that it produces long-term savings. Potential cost savings depend on many factors: current operating costs, investment in telework infrastructure (for example, if a firm invests in a computer server for only one teleworker, savings will be much less than if the same investment handled 10 teleworkers), and whether telework is linked to changes in organizational structure.

Telework and Use of Office Space

Telework can be performed:

- From the employee's home.
- From an employer's satellite office close to the employee's home.
- From a telecenter (an office in which employers rent space for teleworkers).
- Entirely remotely (from locations such as hotels, airports, or client offices).

Most telework is currently done from the employee's home. According to ITAC's Telework America survey, only seven percent of teleworkers work exclusively from telecenters, while another four percent work from both home and telecenters. Entirely remote work is uncommon; it is most likely to be practiced by a mobile sales force or other employees who travel extensively. In a "hoteling" arrangement, employees no longer have a permanent workspace in the main office, but are assigned an office based on their need for space. This arrangement can reduce real estate costs, since several teleworking employees can share a single office, on different days. This arrangement tends to work best when teleworking employees use the main office infrequently, and need relatively few physical files—that is, they need only phone and computer access. However, there are many varieties of hoteling and space sharing, and in some cases they are used by teleworkers in the office as many as three days a week.

Management Issues

Managing employees who are not at the workplace daily poses a number of challenges. Duxbury and Neufeld studied how workplace communication changed when employees began teleworking, and reported that employees and managers raised three main issues:

- Communications between managers and employees became more formal (increased use of phone and memos, with a concurrent decrease in face-to-face meetings).
- Ability to make spontaneous work assignments and decisions decreases and there is a loss of informal office culture.
- Perceptions by co-workers that the teleworker was not working while at home (e.g., "Co-workers seem afraid to call me at home. They think they'll be bothering me.") and occasional jealousy of teleworkers.

These potential problems can be avoided through careful selection of telework participants and training.

Guide to Implementation

Telework can reward businesses in terms of recruitment, retention, and cost savings. However, implementing a telework program involves a high degree of investment in information technology, trust in workers, changes in supervisory techniques and expectations, and support from management. The following suggested 12 steps are drawn from the Office of Personnel Management (OPM) and the American Health Information Management Association (AHIMA). These steps are meant to be a rough guide for interested employers; specifics may vary depending on the size of the firm, the nature of the work, and the potential number of teleworkers.

1) Designate a telework coordinator and/or implementation committee.

Before proceeding with a telework project, key stakeholder personnel should be identified. This committee might include representatives from human resources, information management, risk management, facilities management, senior management, and select employees.

2) Obtain support from senior management.

Senior management should be involved and supportive from the inception of the program. Implementation of a telework program may raise issues such as changes in supervisory techniques and productivity measurement of which senior management should be aware. In addition, a telework program will involve both start-up and on-going costs.

3) Determine employee interest.

The program coordinator or committee should determine the extent of employee interest in telework, perhaps through a survey or orientation sessions. General parameters of a possible program could be discussed. Two other groups of employees should be considered at this time. First, unions should be included in the decision-making process. Employers sometimes encounter concern from unions, including fear that employees will be forced to work at home when they prefer to remain in an office setting, or that telework may become a way to squeeze more work out of employees. Second, managers will benefit from orientation and education about telework. Early involvement by managers may avoid the fear that telework is something being "done to them," and can also alert the coordinator or committee to real or perceived problems.

4) Explore which arrangement (home-based, hoteling, telework center, or other) will be most feasible and productive.

Companies can set up telework programs in many ways, as described above. The best arrangement for a particular employer will depend on many factors—the type of work (for example, data entry from home one day per week, or most time at sales and client meetings), the size of the company (will there be enough employees to make setting up or renting telecenter space economically feasible?), and the type of remote computer access needed. If there are area telecenters, the committee should make a recommendation as to whether they are a possibility. The decision should be made with input from affected departments and senior management.

Telecenters offer the advantage of being already set up with computing equipment and in many cases professional staff; on the other hand, fees may be several hundred dollars per month or more to use the facility one day per week.

5) Identify specific positions appropriate for telework arrangements.

Not all positions are suitable for telework. Generally the positions most suited for telework are knowledge- and information-intensive positions (analysts, researchers, data entry, programming, etc.), positions that require outside meetings (sales representatives, etc), and other positions whose duties can be performed out of the office (telephone work, reading, writing).

Positions that require face-to-face interaction with co-workers or clients (medical/nursing, receptionist, elementary school teaching), access to site-specific files (military personnel dealing with classified information), and other jobs that require presence in a particular location (photographer) are generally not suitable for telework.

Also, telework participation does not have to be all or nothing; many positions may require some face-to-face contact, but can still be suitable for part-time telework.

6) Determine equipment, technology, security, and liability needs and costs.

Telework requires, in most cases, sophisticated information technology equipment to give employees access to company files, internal networks, and e-mail. In addition, many employees may require additional phone lines, fax machines and printers, and standard office equipment.

A company's information technology department should assess the company's current infrastructure to determine whether upgrades or new equipment are needed and what level of security should be provided. Employees should have access to similar equipment that they have in the office to maintain the same level of productivity. In general, the older the current equipment, the more costly and difficult it will be to implement telework. The technical issues related to remote access are too complicated to explore in depth in this paper. A useful list of articles reviewing broadband and DSL options can be found at <www.gilgordon.com/resources/reports.htm>. The ITAC e-Work Guide available at <www.telecommute.org/resources/eworkguide.htm> also has a chapter dedicated to technology issues.

Cost estimates for equipment procurement and installation may take time to prepare, especially if a company has complex security or proprietary information issues to address.

In addition, employers should explore potential liability issues regarding loss or damage to home-based employer-owned equipment, loss of valuable company information through computer failure or hacking, and workplace injuries that occur off-site. The company's insurance policies should be updated accordingly.

7) Prepare and present a telework proposal.

Before beginning any telework program, the following parameters should be well defined:

- **Pilot program.** Will there be a pilot program to be evaluated before an organization-wide adoption of telework? If so, appropriate guidelines should be developed.

- **Telework policy for the organization.** This policy would define eligible positions, guidelines for participation (e.g., an employee must work full-time for a year before becoming eligible, or have certain defined work skills), financial responsibility (e.g., the employer pays for equipment and installation, but the employee agrees to pay for additional insurance against theft), and any change in status or benefits for teleworkers.

- **Telework agreement.** Both OPM and AHIMA recommend formal agreements between employers and individual employees who want to telework. The agreement should include such topics as trial period, official duties, work schedule, timekeeping and leave, equipment and supplies (including ergonomic standards and other OSHA issues), security and liability, worksite criteria, costs, injury compensation, and performance evaluation. Sample agreements are available at <www.opm.gov/telework/policies/Tele-Sam.asp> and <www.telecommute.org/resources/eworkguide.htm>.

- **Screening criteria.** Subject to equal employment opportunity criteria, an employer should screen potential teleworkers via survey form or personal interview. Criteria might include the type of job duties to be performed, the degree to which the employee can be evaluated based on work products, not physical presence, and suitability of employee's home as office space. The company should have a clear policy on telework eligibility to diminish perceptions or possible accusations of favoritism or discrimination.

  Similarly, employees should screen themselves if their home situation is not suitable in some way, or if the person does not have the self-discipline needed to work from home. Also, employees should be clear that they cannot both telework and care for dependents simultaneously.

- **Evaluation criteria.** If the employer sets up an initial pilot program before implementing a full-scale telework program, evaluation criteria should be selected. Such criteria could include employee productivity (along with basis for measurement), employee satisfaction, client or customer satisfaction (for example, if a customer service representative begins working from home), and degree to which other employees in a section are affected by a teleworker (e.g., is other employees' work hindered by the teleworker's absence). If a formal evaluation is to be completed, baseline benchmarking data should be established so before-and-after comparisons can be made.

8) Take final steps toward implementation.

This includes procuring and installing equipment, selecting teleworkers, disseminating telework guidelines and policies, signing telework agreements, and setting an implementation date.

9) Train all personnel involved.

Telework involves new ways of working as well as supervising and evaluating, so participating personnel—whether employees or supervisors—should receive training. Some companies even set up a simulation lab in which potential teleworkers can work for several weeks under conditions similar to their potential home office set-up: no face-to-face contact with other employees and remote computing access. This allows them to determine their suitability for telework.

In addition, a company may wish to develop a training program for supervisors to familiarize them with the demands and issues raised by teleworking—lack of direct personal contact, potential difficulties with on-site employees, and measuring productivity. Some consider supervisor training as important as employee training.

10) Administer pre-telework evaluation.

If a before-and-after benchmarking survey is to be done, the pre-telework survey should be administered at this point, before program implementation begins.

11) Implement the program.

Once equipment, guidelines, agreements, and training have been signed and completed, telework can be implemented.

12) Assess results.

After a period of time, the company should assess the program's efficacy. If a before-and-after survey was conducted, the after data should be assessed. Those results, as well as other measures of cost, productivity, and morale, should be compared to evaluation criteria established earlier. This will form the basis for determining whether the program should be continued in its current form, expanded, or otherwise modified.

Implementation Costs and Administrative Burden

Unlike many other commuter benefit programs, telework involves a major commitment of both financial and staff resources. The heaviest burdens tend to fall on two groups:

Supervisors must revise their methods of managing employees out of their direct contact and deal with the tensions that can arise between employees at the workplace and those working remotely. However, this can yield benefits, according to one telework expert:

> *In fact, we consistently hear that managers who manage remotely report that doing so makes them better managers not only of the remote workers but also of their in-office staff. (Gordon, 2001)*

Information technology departments will be responsible for carrying out an IT gap analysis to determine telework infrastructure start-up needs and costs and providing ongoing support to teleworkers, who rely more heavily on computer networks and remote access.

Employer Questions and Answers

Employers (e.g., a human resources administrator or business manager) considering a telework program might commonly ask the following questions:

Does telework negatively affect productivity?

No, in fact productivity may increase. Many employees report that they experience fewer distractions when teleworking. Some employers have been pleasantly surprised to find that employees are more accessible when they are working from home because managers know exactly where they are, and they have fewer meetings and/or spend less time with co-workers. Examples of measured increases in productivity from existing telework programs include AT&T (20%-35%), Blue Cross Blue Shield (20%), and Cisco Systems (18%).[7]

What does it take to set up and administer a telework program?

It depends on several factors—the scale of the program (size of company and number of employees who will telework), the type of information technology selected, and the goals of the program (will telework mean a few employees performing their regular duties out of their homes, or a more fundamental re-engineering of the workplace?)

Large-scale programs require substantial commitment for planning and implementing the program, and the involvement of the information technology departments will be much more significant and critical. In addition, telework programs require continuing investments of both money and staff time. There should also be agreements between managers and employees. This agreement should cover what the work hours will be, what the deliverables are, how often voicemail at the office will be checked, etc. Many telework agreements may actually help managers uncover areas for further development and performance for employees.

How does working at home affect dependent care issues?

Teleworking employees should not expect to simultaneously work and care for their dependents (children or elders). Although many employees who telework do so because they prefer to be near home in case of an emergency or to have additional time to spend with their families, employees must make arrangements for dependent care. This understanding should be part of a formal telework agreement, so that employees are aware of the need to separate dependent care from work.

Who typically pays for increased electricity and telephone costs?

This is generally covered under the telework agreement. In the federal government, OPM guidelines allow reimbursement for official telephone calls, but not for increased electricity costs resulting from use of computer equipment.

Is there an ideal percentage of employees that should be teleworking?

No. Some firms have only a small percentage of employees teleworking; others have near-virtual offices, where employees work independently. It depends on the nature of the business, the type of work performed by the employees, employees' suitability to work independently, the company culture, and the technological capabilities available.

However, in order to qualify for the Best Workplaces for Commuters℠ program, you must have a telework program that reduces on average at least 6 percent of commute trips on a monthly basis.

Do employees and supervisors need training before starting a telework arrangement?

Training is generally a good idea because of the major change in the working relationship and risk management issues relat-

[7] *Connecticut Department of Transportation, Bureau of Public Transportation, 2004 Telecommute News*

ed to telework. Some guidelines even recommend setting up a simulation for employees who want to telework, so that they can experience remote work for several weeks and judge whether they would be suitable candidates for the arrangement. Supervisors might also be trained in management techniques for distance employees, such as how to manage by results and assess productivity. Guidelines should be implemented to create an official set of operating procedures. Guidelines can clear up any misunderstandings and act as an indicator for success. Managers should also focus on deliverables and quantifiable measures that show whether an employee is doing a good job.

Do any state or local governments offer incentives for implementing telework?

Some regional organizations offer technical assistance for implementing telework programs (see below under Associations and Contacts for more information). In addition, the state of Oregon offers a tax credit for implementing teleworking programs (see the Tax Considerations section above for more information). In spring 2001, Virginia introduced a Telework!VA pilot program through which employers in northern Virginia could receive state reimbursement for certain telework start-up or expansion costs, up to $35,000 over two years.

Telework Technology

Recently, the use of high speed broadband Internet has increased dramatically. In 2003 there were 4.4 million teleworkers working at home with broadband. In 2004 there were 8.1 million telework—an 84%[8] increase. Prices for high-speed Internet access have not gone down significantly and they remain at a monthly fee of approximately $30 to $35 for DSL and $40 to $45 for Cable. In addition, there has been rapid growth in the number wireless hotspots, which often provide free high-speed Internet access. Broadband teleworkers reported an average productivity increase of 33.3 percent.[9]

There are also many Web-based Internet services that provide useful tools for businesses that telework, requiring no installation or IT assistance.

The use of video conferencing and Web conferencing is a valuable productivity tool. Web conferencing allows work groups to set up video meetings, which often results in more efficient communication between employees. Employees can enjoy the benefits of a standard "round table" meeting while sitting at their computer in any geographical area. This service also requires no software installation and therefore limited IT assistance or training.

There are also project management services that make communication more efficient than in an office. These services provide a central platform that is password-protected and easily accessible by all members of a work group. These Web-based services require no installation and very limited IT assistance and training.

Resources:

Wireless hotspot locations can be found at <www.boingo.com/search.html>.

Broadband availability can be searched for at <reviews.cnet.com/Broadband_power_search/4002-6549_7-5114723.html?tag=tool>.

Video conferencing information is available at <www.webex.com>.

Information on project management tools is available at: <www.intranets.com/default.asp>.

Employer Case Studies

Case Studies

AstraZeneca

AstraZeneca created its telework program as a result of a headquarters relocation. In 2000, Astra merged with Zeneca and moved its headquarters from Pennsylvania to Delaware. For the employees who worked in the Pennsylvania office, the move added an hour to their commute time. Management recognized the amount of talent they would lose if these employees were not willing to commute an extra hour. They also recognized the costs of retraining new employees and hoped to avoid the danger of employees working at competing companies. As a result, they decided to increase overall workplace flexibility, which included a telework program.

In addition to the motivation of retaining valued employees and avoiding retraining costs, AstraZeneca also faces a Delaware state traffic mitigation law that mandates at least 15 percent of their employees not drive in single-occupancy vehicles. The telework program helps AstraZeneca meet this mandate. The program now includes 600 employees who

[8] *http://www.ccnmag.com/?nav=headlines&id=3197*
[9] *http://www.workingfromanywhere.org/pdf/TWA2003_Executive_Summary.pdf*

have signed contracts and received training on effective teleworking, and 275 employees are actively teleworking. The major costs in setting up the commuter benefits program consisted of the following: broadband Internet service, shuttle services, Transportation Management Association (TMA) membership, and membership in the Association for Commuter Transportation (ACT). These costs were outweighed by the overall benefits of the program. This number does not include the non-monetary benefits of keeping valued employees.

LexisNexis

The LexisNexis telework program is called "Alternate Work Solutions," and supports people who telework from home part-time or full-time. In 1995, the company began a pilot program, encouraging select employees to work from home. Within a year, the company had saved $6 million in operating costs. By 1996, the program was completely established and has been profitable for LexisNexis ever since. According to an April 4, 2004, Best Workplaces for Commuters℠ Phone Forum, the Senior Director of corporate Services for LexisNexis, Debra McKenzie, offered the following lessons:

- It is important not only to train employees to connect to the office network from home, but also to train managers to direct a team that is not physically present.
- Strong commitment from company executives eases the implementation of telework programs.
- By evaluating an employee's performance, employers can determine if the employee would be a productive teleworker or if the employee should continue to work on-site. And it is equally important that the manager be evaluated on their capability to manage virtually.
- To ensure that the employee remains productive while working at home, managers require the employee to sign a contract that details working hours and the communications process the employee will use to stay in contact with management.

Sun Microsystems

Sun Microsystems started its telework program by organizing a group of employees from the finance, tax, legal, and human resources departments. The group researched other companies that already had telework programs in place and tested pilot programs. Preliminary research indicated that a telework program would improve both the employee culture and the company's bottom line.

Sun is involved with telework in two dimensions: it offers telework to employees, and it also uses its established telework program to help set up other companies with the necessary telework technology and infrastructure. Their internal telework program is called the iWork program, which enables over 3,000 employees to work from all over the country, in Canada, and in ten European countries. Sun also distributes information about commuter benefits and other regional commute programs via email in their SMART (Sun Microsystems Alternative Resources for Transportation) internal commute program Web site. Employees have reported a 34 percent increase in productivity and increased job satisfaction. Most recently, in a September 2004 media release, Sun Microsystems was ranked 5th in the list of the top 20 Best Workplaces for Commuters℠ (BWC) for Fortune 500 companies with 60 percent of its employees working at BWC-designated work sites.

Services That Support Implementation

Many regional and local governments provide services to help employers implement telework programs. Metropolitan planning organizations (MPOs), city and county transportation agencies, transportation management associations (TMAs), and transportation management organizations (TMOs) throughout the U.S. provide assistance to employers in starting and maintaining transportation demand management programs such as telework. They often provide information to employers about options to reduce driving to work, implementation issues, and local programs that support employer initiatives. Some of these resources are listed in the next section.

Depending on the nature of the work, the ability to telework effectively may be linked to the availability of high-speed Internet connections. Access to these services varies throughout the country.

Associations and Contacts

This section includes information on regional and national groups that regional, state, and local governments might wish to utilize for expertise in understanding, promoting, or providing technical information on telework.

Individual employers are directed to contact, their local MPOs, telework consulting firms, or other groups that provide services to support telework implementation.

Organizations That Promote Telework

International Telework Association and Council

204 E Street N.E.
Washington, DC 20002
Tel: (202) 547-6157
Fax: (202) 546-3289
www.telecommute.org

The International Telework Association and Council (ITAC) is a membership organization for businesses that sponsors research and surveys on telework. ITAC maintains an extensive list of member consultants, available at www.telecommute.org/resources/consultant_members.shtml.

The American Telecommuting Association

1220 L Street, NW, Suite 100
Washington, DC 20005
Tel: (800) ATA-4-YOU
www.knowledgetree.com/ata.html

The American Telecommuting Association (ATA) is a membership organization whose members are employees that telework.

National TDM and Telework Clearinghouse

University of South Florida
4202 E. Fowler Ave.
CUT100
Tampa, FL 33620-5375
Tel: (813) 974-3120
www.nctr.usf.edu/clearinghouse/

The National TDM (Transportation Demand Management) and Telework Clearinghouse is a compendium of research and information on TDM and telework. TDM refers to a set of programs and policies that are designed to make the best use of existing transportation resources without additional infrastructure investment. Much of the Clearinghouse information is available electronically at their Web site. The site contains information for employers interested in establishing various kinds of trip reduction programs, including teleworking.

Clean Air Council

135 South 19th Street Suite 300
Philadelphia PA 19103
Tel: (215) 567-4004
Fax: (215) 567-5791
http://www.cleanair.org/Transportation/greenCommute.html

The Clean Air Council supplies information on telework as a means to reduce air pollution.

Online Resources

Several other private firms and organizations have online information regarding telework; the list below is a sample.

Gil Gordon Associates maintains a Web site with a wide variety of information, including links to research articles and "how-to" tips.
www.gilgordon.com

JALA International is a consulting firm founded by Jack Nilles, who originally coined the terms "telecommuting" and "telework".
www.jala.com

The "Work At Home Success" Web site is aimed more at employees who wish to begin teleworking, but it also offers advice to employers thinking of implementing telework programs.
www.workathomesuccess.com/telecomm.htm

Regional Resources

Some regions have programs offering technical assistance to local businesses that are interested in setting up telework programs. The type of assistance offered depends on the program; it may include technical assistance tailored to a company's individual needs, presentations for business audiences on telework issues, and/or compilations of case studies of other area employers.

Atlanta, Georgia

Metro Atlanta Telecommuting Advisory Council
704 Beacon Cove
Lawrenceville, GA 30043
Tel: (770) 831-6630
www.matac.org

Arizona

Valley Metro
302 N First Avenue
Suite 700
Phoenix, AZ 85003
Tel: (602) 262-7433
www.valleymetro.maricopa.gov/telecommute

Colorado

Telework Colorado
Tel: (303) 458-8353
www.teleworkcolorado.org

Connecticut

Telework Connecticut
C/o Rideworks
389 Whitney Avenue
New Haven, CT 06511
Tel: (203) 777-RIDE
Fax: (203) 773-5014
www.telecommutect.com/

Houston, Texas

Commute Solutions
Houston-Galveston Area Council
P.O. Box 22777
3555 Timmons Lane
Houston, TX 77227
Tel: (713) 627-3200
Fax: (713) 993-4508
www.commutesolutionshou.com/telework/index.htm

Los Angeles Area

Southern California Economic Partnership
21865 E. Copley Drive
Diamond Bar, CA 91765
Tel: (909) 396-5757
Fax: (909) 396-5754
the-partnership.org

Minneapolis, Minnesota

Midwest Institute for Telecommuting Education
1900 Chicago Avenue
Minneapolis, MN 55404
Tel: (612) 752-8010
Fax: (612) 752-8001
www.mite.org

Oregon

Oregon Office of Energy
625 Marion Street, NE
Suite 1
Salem, OR 97301
Tel: (503) 373-7560
www.energy.state.or.us/telework/teletax.htm

Seattle, Washington

Commuter Challenge
1301 Fifth Avenue
Suite 2400
Seattle, WA 98101-2611
Tel: (206) 389-8656
www.commuterchallenge.org

Washington State

WSU Cooperative Extension Energy Program
925 Plum Street SE, Bldg. #4
P.O. Box 43165
Olympia, WA 98504-3165
Tel: (360) 956-2178
Fax: (360) 956-2217
www.energy.wsu.edu/telework/

Washington, DC/Northern Virginia

Commuter Connections
777 North Capitol Street, NE
Suite 300
Washington, DC 20002
Tel: (202) 962-3286
Fax: (202) 962-3202
www.mwcog.org/commuter/telresctr.html

Commuter Connections also administers the Telework!VA financial assistance program for employers located in Northern Virginia.

Emissions and Transportation Benefits

Telework has great potential to reduce vehicle travel and emissions of air pollutants and greenhouse gases because it eliminates many commute trips. Most studies of the air quality and emissions benefits of telework agree that teleworkers drive significantly less when teleworking. That is, the vehicle miles traveled (VMT) reduced are not usually replaced with more local non-work driving.

A review of the telework research by the National Environmental Policy Institute found that the average round-trip commute distance for teleworkers is 36.1 miles, and that on the days they telework they saved an average of 26.3 miles. However, only 74 percent of teleworkers drive alone, so that even on the days they telework, total vehicle miles traveled may remain unchanged (for example, if the teleworker rides with a carpool). (NEPI, 2000)

Two studies that looked at total travel by teleworkers (including non-work trips on days they telework) found that the average number of miles traveled per day was 52.9 before teleworking and 13.1 miles per day on telework days. (NEPI, 2000)

A study using travel diaries found similarly positive results. An evaluation of the Puget Sound (Washington State) Telework Demonstration project compared a control group

of non-teleworkers to a group of teleworkers, and telework days to non-telework days. Telework had demonstrable effects in reducing VMT and emissions. On telework days, the number of daily trips decreased by 30 percent, VMT decreased by 63 percent, and the number of cold starts decreased by 44 percent. A "cold start" is particularly problematic for emissions, because a car's engine and emissions control systems work well only after warming up. A substantial portion of a car's total trip emissions occur at start-up, so avoiding a trip altogether is far more "valuable" from a pollution perspective than shortening the trip. The study calculated, using an emissions model, that for each telework day, the teleworker's vehicle released 50 to 60 percent less pollutants than if the teleworker had worked in the office. This includes additional non-work trips made while at home—teleworkers drove less on the days that they teleworked than they did on regular commute workdays.

While this study concluded that telework has a demonstrable effect on emissions, it also noted several reasons why more widespread telework might not produce proportionally larger results. First, teleworkers had average commutes 2.5 times longer than the control group. Indeed, this is probably one of the reasons this group chooses to telework, since they save more time by not commuting.

This implies that as telework increases, and teleworkers' commute length falls, the relative benefits produced by new teleworkers will fall somewhat?although they should still be positive.

Second, the benefits are confined to the days teleworked; if people telework only one day per week, those benefits amount to only 20 percent of the potential benefit of teleworking five days per week. Finally, the study notes that emissions benefits will differ with the time of year since atmospheric conditions affect both the amount of pollutants released by vehicles and the formation of ozone. (Henderson, et al, 1996)

Telework is one of the most effective transportation demand management (TDM) emissions reductions measures. A study done by the Metropolitan Washington Council of Governments of four transportation emission reduction measures found that its Telework Resource Center (a program that assists businesses in implementing teleworking) was the most effective of the four, reducing the number of vehicle trips by almost 35,000 per day. The program was also estimated to reduce nitrogen oxides (NO_x) emissions by .9 tons per day, and volatile organic compounds (VOC) by .5 tons per day. However, the evaluation also noted that the effectiveness of telework as a measure to reduce emissions is limited by two factors. First, although it was predicted that teleworkers would work remotely 2.65 days per week, the average was only 1.59 days. Second, only 71 percent of teleworkers drove alone on the days that they go into the office. (Metropolitan Washington Council of Governments, 2001).

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[*] *Example from: www.bwc.gov/employ/csparking.htm.*

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Item 5.
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Customer Case Study

University Gains Significant Savings by Reducing Travel

The University of Missouri uses TelePresence to reduce travel costs and increase productivity.

EXECUTIVE SUMMARY
THE UNIVERSITY OF MISSOURI • Industry: Higher Education • Location: Columbia, St. Louis, Kansas City, and Rolla, Missouri, United States
CHALLENGE • High travel costs for inter-campus meetings • Traveling long distances between campuses caused hours of lost productivity
SOLUTION • Cisco TelePresence and Cisco Planning and Implementation Services
RESULTS • Quickly achieved high system utilization • Avoided travel costs for 51 meetings in one month • Enables administrators to have high-quality meetings and go home at night

Challenge

The University of Missouri was the first public university founded west of the Mississippi River and today is Missouri's largest public research university. Four campuses are located in St. Louis, Columbia, Kansas City, and Rolla, with the distance between campuses ranging from 120 to 255 miles. Senior administrators travel frequently between campuses for meetings, and with long distances to drive, the time and costs of having multiple people travel for meetings add up. For example, an administrator might lose four hours of time each way if traveling between Kansas City and Rolla. He or she might require an overnight stay if traveling from St. Louis or Rolla to Kansas City.

The University is always seeking ways to reduce costs and improve productivity. Cost benchmarks were established basing each trip on an average of US$38 per hour, per person, for time spent traveling, and six hours of lost productivity for the shortest trip.

Overnight trips cost approximately $300 per person. There were typically 12 attendees per meeting, and up to 75 percent of attendees had to travel to attend. Using these numbers, the University calculated that it could potentially save $4500 per meeting.

The University had successfully used videoconferencing systems for many years, beginning with compressed standard-definition video and migrating to single-screen, high-definition systems. Uses included both business meetings and course delivery. However, video quality was not optimal and video systems could be difficult to use. A technician would have to schedule the meeting and be on site or available to help ensure that the meeting began successfully. With these limitations, many meeting attendees elected to use simpler audio conference calls. However, for large or important meetings, it was often more productive to meet in person, and so people traveled.

> "As we move ahead in the 21st century, there are numerous opportunities to maximize the benefits that technology offers. Today, Cisco TelePresence is dramatically improving the quality of our collaboration and helping us reduce travel costs at the same time. Tomorrow, we expect to extend our collaboration capabilities into innovative educational experiences across the university system."
>
> **— Gary Forsee, President, University of Missouri System**

Solution

When Gary Forsee became president of the University in 2008, his experience as former chairman and chief executive officer of Sprint Nextel in telecommunications brought a new appreciation for innovation to the school. Mr. Forsee is also an alumnus of the University of Missouri with a passion for education.

"As we move ahead in the 21st century, there are numerous opportunities to maximize the benefits that technology offers," says Forsee. "Today, Cisco TelePresence is dramatically improving the quality of our collaboration and helping us reduce travel costs at the same time. Tomorrow, we expect to extend our collaboration capabilities into innovative educational experiences across the university system."

A first step toward using technology to help improve education was the decision to implement Cisco TelePresence™ solutions at the University of Missouri. The immediate objective was to help the University reduce travel costs while preserving the quality of meeting interaction. Four TelePresence systems were deployed, one at each campus in 2009. Cisco® Services was engaged for Design, Planning, and Implementation of the first system in Columbia.

PRODUCT LIST
Voice and IP Communications
• Cisco TelePresence 3200

Working hand in hand with the University's facilities department on each campus, Cisco Services provided the TelePresence standards and advised on initial room choices and design. Room sizes, lighting, paint color, and other factors were implemented consistently at each campus to help ensure a consistent experience for meeting participants. Cisco Services then implemented the system and worked with AT&T, the University's wide-area network provider, to connect the TelePresence systems through MOREnet, the organization that links Missouri schools, public libraries, academic institutions, and state agencies through a statewide research and education network. MOREnet assumed management of the TelePresence systems after they were deployed.

"Cisco Services worked closely with us to provide the expertise required for the project and to help ensure a successful launch," says Terry Robb, University IT project manager for the project. "We had deployed all four systems by June of 2009 and launched the service into production in August. People have taken to it immediately."

Results

The TelePresence system at Columbia is installed in Ellis Library, providing a public, central location for administrators to meet. To date, senior administrators, IT managers, and members of the University's Sustainability Committee rely on the system to avoid having to travel between campuses. Meetings are scheduled through Outlook and commence with the touch of a button. Users no longer have to wait for a technician to start a conference, and meetings can start on time without aggravation.

Usage is growing steadily. In March 2010, 51 meetings were conducted for over 89 hours and 43 percent utilization. The University is well on its way to seeing significant reductions in travel costs and now participants can meet and go home in the evening.

"I had never been a fan of video, because it was always difficult to use and hard to schedule," says Robb. "Additionally, compressed video limited picture quality. Cisco TelePresence completely changed my mind. Finally, there is a video platform that is really easy to use, and the quality is unbelievable. It is working out extremely well."

Next Steps

As use increases, the University of Missouri plans to continue in its quest for using technology to improve education.

For More Information

To find out more about Cisco Services, visit: www.cisco.com.

To learn more about University of Missouri., visit www.missouri.edu.

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Item 6.
CISCO Telsco Uses Collaboration Tools To Support Rapid International Growth, © 2009 Cisco IBSG

Success Story

Tesco Uses Collaboration Tools To Support Rapid International Growth

Executive Summary

CUSTOMER NAME
Tesco plc

INDUSTRY
Retail

CHALLENGES
- Work effectively as a geographically distributed organization.
- Efficiently introduce critical business and IT processes to new markets.

SOLUTIONS
- Collaboration tools supporting innovation, knowledge sharing, decision making, and operational excellence.
- Collaboration framework that integrates technologies into Tesco business processes, enables Tesco to scale the deployment of collaboration tools, and makes the tools easier to understand.

RESULTS
- Higher productivity and faster decision making.
- More scalable and effective training and knowledge sharing across long distances and different time zones.
- Faster time to market and reduced operating costs in Tesco's growing international business due to faster deployment of business and IT processes in new markets.

Background

Tesco plc is a British-based international grocery and general merchandising retail chain. With a turnover of UK£59.4 billion and profits of £3.03 billion in 2009, it is the largest British retailer and the world's third-largest grocery retailer. Tesco operates in 14 countries worldwide, with 65 percent of its revenue coming from the United Kingdom and the remainder coming from Asia, Europe, and the United States. While Tesco continues to develop its core U.K. business and its nonfood and retailing services, the company is investing most heavily in international expansion as the key to achieving its goal of double-digit growth. To enable the company to roll out operations in new markets more quickly and cost effectively, Tesco has developed an operating model consisting of a common set of business processes and IT systems. The operating model has already been deployed in China, Japan, Turkey, and the United States.

Challenges

An ever-present challenge for Tesco is how to work effectively across its geographically dispersed organization. The company's ambitious plans for international growth depend to a large extent upon rapid and successful adoption of the Tesco operating model in each new geography. Continued expansion, however, was making it harder to manage this process in a timely and cost-efficient way.

"Implementing our operating model in our international businesses allows us to lower our operating costs and to pass on savings to our customers through lower retail prices," says Mike McNamara, head of operations development and IT worldwide. "In turn, we gain customers and our business grows. The quicker we can do this, the better for our customers and for our profits."

Tesco's organization combines IT with International Operations Development (IOD), the group responsible for the company's business processes. Employees in IT, IOD, and HSC (the Hindustan Service

Centre in Bangalore, Tesco's global services facility) are responsible for helping colleagues in each geography introduce and optimize the operating model, then for providing ongoing monitoring and support.

The IT and IOD teams were particularly affected by the demands of international expansion. They traveled frequently to each geography, a costly approach that was impossible to scale and incompatible with Tesco's environmental sustainability strategy. They found telephone calls less satisfactory than face-to-face meetings due to the lack of visual communication, while paper-based knowledge and skills transfer could not deliver the required levels of understanding with sufficient speed.

"Tesco people are practical and hands-on. It makes a huge difference to us if we can see something and touch it. IBSG understand this and they put a lot of effort not only into showing us these new technologies but also into helping us understand new ways of working."

Mike McNamara
Head of Operations Development and IT
Tesco

Tesco recognized that it needed new ways of collaborating to improve productivity and support international growth. The company wanted to bring mature retail practice and experience from the United Kingdom into its new and emerging markets, while capturing and managing thought leadership and best practices from all parts of the organization. Another priority was to improve the quality of employees' interactions, no matter where they were located. "It's one thing to implement IT systems, processes, and organizational structures, but quite another to overlay the craft and deep skills we need in order to work effectively," says McNamara. "To add the craft and skill, you need a lot of touchpoints, and that's where collaboration tools can make a big impact."

Tesco had introduced a Next-Generation Network (NGN), based on Cisco® technology, to provide the company's employees across the globe with faster connectivity. This enables employees to communicate more easily with each other and to access networked data more quickly, improving their own productivity and helping to enhance customer service. Another advantage of the NGN was its ability to support rich-media technologies such as Cisco TelePresence™, which uses the network to create face-to-face meeting experiences for people in different locations.

When Tesco saw the effectiveness of Cisco TelePresence in creating "virtual" meeting environments, the company asked the Cisco Internet Business Solutions Group (IBSG) to consult on the business potential of collaboration technologies.

Solutions

Cisco IBSG began by sharing with Tesco best practices from Cisco and other organizations in Web 2.0-enabled asynchronous forms of collaboration such as social networking, wikis, and blogs. To help Tesco assess the level of interest in these tools among its workforce, Cisco ran an employee survey that yielded very positive feedback. Out of 856 respondents, for example, 95 percent said they would like to read blogs from their business leaders and 87 percent were willing to keep their personal details up to date in a Tesco directory.

Exploring Collaborative Options

A project team then developed three Web 2.0-type collaboration tools—a discussion forum, blogs, and a wiki—using freeware, and set up a pilot for teams in IT, IOD, and HSC. The objectives of the three-month pilot were to see how many people would use the tools and what value they could bring to the business. Discussion forums and blogs emerged as the tools that people liked and wanted to use; during the pilot, for example, 520 people took part in discussion forums on 78 topics.

"The longer you go without checkpoints, the more likely things are to drift. I prefer frequent, short, high-quality interactions to gently correct course. This is exactly what TelePresence allows."

Mike McNamara
Head of Operations Development and IT
Tesco

On the basis of the outcomes of the survey and pilot, Tesco executives approved the development of Intra 2.0, a new version of the company's intranet. Intra 2.0 is based on a Web 2.0 platform and incorporates a wide range of functions—from discussion forums and blogs to a directory, presence, and customization.

Testing the Value of Cisco WebEx™

Tesco had started using Cisco TelePresence in its U.K. offices—including the group headquarters—and in China, Hong Kong, India, Korea, and Malaysia. Utilization rates for every TelePresence suite soon reached 80 to 90 percent, and this rapid takeup led Tesco to look for tools that would be more scalable in terms of the required investment, and more suitable for certain types of collaboration. Cisco WebEx web conferencing and collaboration software, for example, is ideal for training and other activities that involve knowledge sharing because it enables users to share their desktops and give control to other people.

With Tesco's agreement, IBSG conducted a three-month Cisco WebEx pilot for 40 users and recorded positive results in two surveys:

% of Respondents	Had used and valued the ability to:
97	Share documents
44	Share live systems and business applications
56	Pass control of their desktop to other people
% of Respondents	**Agreed or strongly agreed that Cisco WebEx helped them:**
88	Improve meeting quality
91	Achieve better understanding of subjects
60	Overcome language barriers

Participants in the pilot estimated that using Cisco WebEx had saved them almost two hours per week on average.

The Cisco WebEx pilot helped Tesco make a decision based on a real-life scenario. "Tesco people are practical and hands-on. It makes a huge difference to us if we can see something and touch it," says McNamara. "IBSG understand this and they put a lot of effort not only into showing us these new technologies, but also into helping us understand new ways of working."

"I enjoy working with Cisco IBSG. In no sense is our relationship transactional, as it can be with many suppliers. IBSG provide us with technology leadership, and they have insight and experience in their kit bag. Because they actually use the technologies they consult on, they know how to make them work and benefit our business."

Mike McNamara
Head of Operations Development and IT
Tesco

Collaboration Vision and Framework

With Intra 2.0 under development, Tesco needed to prioritize and scale its use of the new collaboration tools. IBSG identified four core business areas that could benefit most from Web 2.0 capabilities: trade planning, space range and display (SRD), innovation, and promotions. The Cisco team then ran a series of workshops with Tesco employees from each of these areas to look for opportunities to generate business value through the use of collaboration tools. The end goal was to embed collaboration tools in specific business processes, without reengineering the Tesco operating model, and to make the tools easy for people to use.

The workshops showed that opportunities for using collaboration could best be grouped under four processes: innovation, decision making, knowledge sharing, and operational excellence. Cisco built a framework with workflow templates for each business area, incorporating the appropriate collaborative tools and mapping them to the four processes. In this collaboration framework, innovation is a self-contained entity because it is both a core business area and one of the predefined processes. Trade planning and SRD fit into the knowledge sharing process, while promotions are linked to decision making and operational excellence.

The aim in the innovation area, for example, is to provide a forum for open discussion of ideas, leading to selection and development of the strongest suggestions. Using a customized version of Intra 2, Tesco employees will be able to post, discuss, and track the progress of ideas for innovation. A steering group will then use collaboration tools such as Cisco TelePresence and Cisco WebEx to select and develop the ideas with the most potential. The templates for knowledge sharing, decision making, and operational excellence are similar to the innovation approach and incorporate the same collaboration tools. Tesco decided to begin its deployment of Intra 2.0 by rolling out the knowledge-sharing and innovation elements of the collaboration framework because these elements were most likely to deliver business benefits within a short timeframe.

"I enjoy working with Cisco IBSG," says McNamara. "In no sense is our relationship transactional, as it can be with many suppliers. IBSG provide us with technology leadership, and they have insight and experience in their kit bag. Because they actually use the technologies they consult on, they know how to make them work and benefit our business."

Results

Benefits of Cisco TelePresence

The impact of using Cisco TelePresence in Tesco was immediate and overwhelmingly positive. According to Atul Bhardwaj, international operations development director, using TelePresence has greatly reduced the need to travel within his organization. His team alone has cut its travel budget by 20 percent, while employee morale and work/life balance have improved.

The business has benefited from faster decision making and increased productivity. Bhardwaj's team used Cisco TelePresence to design and review the operating model governance process in China and Korea, for example, and completed the design validation for Korea in two days instead of several weeks. "I can do more with the same resources and I don't need to expand my team because TelePresence enables us to be more effective with our existing people," says Bhardwaj.

For McNamara, Cisco TelePresence is all about getting faster and better quality output from meetings, and doing so more frequently than before. Daily meetings on TelePresence with the HSC in Bangalore have replaced McNamara's previous schedule of regular week-long trips to India. So many meetings were crammed into those trips, in an effort to maximize McNamara's time, that meetings were often too short to be fully productive. Now, thanks to TelePresence, he can meet more people and has enough time to make high-quality connections that benefit the business.

Another advantage is that Cisco TelePresence makes it easier to keep distributed parts of the business on track. "The longer you go without checkpoints, the more likely things are to drift," McNamara says. "I prefer frequent, short, high-quality interactions to gently correct course. This is exactly what TelePresence allows."

Cisco TelePresence has played an important part in reducing the UK IT, Group IT, and IOD teams' long-haul travel by 75 percent and cutting total spending on travel by 45 percent year-on-year.

Collaboration Framework in Action

Even before launching Intra 2.0, Tesco had already started to reap the benefits of a richer collaborative environment:

Innovation: During the Web 2.0 pilot, many people had posted ideas for innovation in a discussion forum. Tesco captured these ideas and put them forward for discussion by a steering group in a series of Cisco TelePresence meetings. Tesco also created an interim website to keep the momentum going until the launch of the innovation area on Intra 2.0.

Decision Making: Because Tesco's IT organization is predominantly run from the United Kingdom and India, distance and time constraints make it difficult to get all the necessary people together to discuss strategy. Chief Architect Mike Yorwerth used Cisco TelePresence to organize a global executive brainstorming session that resulted in all participants agreeing on a global IT strategy. "We did it in three hours, whereas previously we would have waited for six months until we could have a face-to-face meeting," says Yorwerth. "We also achieved a higher level of agreement than ever before, and TelePresence enabled it."

Knowledge Sharing: Cisco WebEx has already been used to give training in floor-planning systems to 12 people from Tesco's SRD team in Korea. A U.K.-based trainer ran the session remotely instead of face-to-face, with the local team providing administrative back-up and content translation. "We saved £12,000 in costs on a single training event," says Russell Price, deployment manager for SRD, Korea. "You still need good support and organization, but I would recommend using WebEx for similar sessions."

"It's one thing to implement IT systems, processes, and organizational structures but quite another to overlay the craft and deep skills we need in order to work effectively. To add the craft and skill, you need a lot of touchpoints, and that's where collaboration tools can make a big impact."

Mike McNamara
Head of Operations Development and IT
Tesco

Cumulative Benefits

Tesco has gained significant benefits from its early use of collaboration tools, in particular the productivity gains in its deployment of the international operating model. The company anticipates even greater value from the more structured approach that will come with the rollout of Intra 2.0 and its embedded collaboration framework. Over time, the impact on the business is expected to be substantial, in terms of faster time to market, improved productivity, fewer errors, less duplication of effort, and cost reductions.

Next Steps

Tesco is continuing to develop its collaboration plans, rolling out Cisco TelePresence to every geography and exploring the role of video within its collaboration framework. Other priorities include launching Intra 2.0 and encouraging people to use it, and scaling the new collaboration tools and processes until they become part of everyday working life throughout the company. Tesco has also decided to appoint a full-time collaboration architect in its IT organization, a move that reflects the business value that the company now associates with collaboration tools. Tesco believes it has only just begun to investigate the full potential of collaboration as a means of implementing, optimizing, monitoring, and transforming its business processes.

Success Story

More Information

The Cisco Internet Business Solutions Group (IBSG), the global strategic consulting arm of Cisco, helps CXOs and public sector leaders transform their organizations—first by designing innovative business processes, and then by integrating advanced technologies into visionary roadmaps that address key CXO concerns.

For further information about IBSG, visit **http://www.cisco.com/go/ibsg**

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ITEM 7.
CISCO Unified Communications Solutions Partner Gains a Competitive Advantage, © 2009 Cisco Systems, Inc.

Customer Case Study

Cisco Unified Communications Solutions Partner Gains a Competitive Advantage

Nexus employees collaborate across time and distance barriers with Cisco Unified Communications and WebEx, and meet virtually with TelePresence.

EXECUTIVE SUMMARY
NEXUS IS, INC. • Cisco UC Solutions Partner • Valencia, California • 375 employees
CHALLENGE • Gain a competitive advantage • Enable collaboration across nine locations • Reduce costs
SOLUTION • Upgraded to Cisco Unified Communications 7.0 • Used Cisco Unified Workspace for Partners with Cisco Unified Communications Software Subscription, for predictable pricing • Deployed Cisco WebEx and Cisco TelePresence
RESULTS • Enabled employees to communicate with each other more quickly • Enabled experts in any location to meet with customers without travel • Saved $31,217 from travel avoidance, in five months • Saved 1830 hours of engineers' time worth US$76,400 in five months

Challenge

Nexus is a Cisco Unified Communications Solutions Partner with headquarters in Valencia, California and eight other offices in California, Arizona, Oregon, Washington, and Nevada. The company provides solutions for unified communications, collaboration, data center, contact centers, mobility, highly available data networking, data protection, and managed services. Nexus has strategic partnerships with information technology leaders and is a Cisco® Gold Certified Partner with a Masters Certification in Unified Communications.

Nexus has an advantage in the highly competitive value-added reseller (VAR) industry because of the depth and breadth of its 170-member technical team, distributed across the company's nine locations. The challenge is enabling engineers with a specific type of expertise to meet with customers in other locations without the time and costs of travel. "For Nexus to compete against firms that have all of their expert resources in a single location, our employees need to be able to collaborate across time and distance barriers as if they all worked in the same office," says Steve Reese, Director of Solutions Marketing, Nexus.

Solution

Nexus employees in any workspace can now collaborate readily, using Cisco Unified Communications and collaboration tools. The company began using Cisco Unified Communications in 2004 and upgraded to Cisco Unified Communications Manager 7.0 in 2008. "We completed the cut-over in five days, with no service outage," says Reese.

> "Cisco Unified Communications Software Subscription is a big advantage, because I don't have to continually ask executives to increase the budget for software upgrades. We can count on fixed costs for three years."
>
> **—Amy Smith, Unified Communications Practice Manager, Nexus**

Most employees use Cisco Unified Personal Communicator, a desktop application for PC or Mac that provides a unified interface for voice, instant messaging, presence, voice messaging, click to call, video, conferencing, corporate directory, and call history. The company takes advantage of Cisco Unified Workspace for Partners to access applications in the Cisco Unified Communications suite at a per-user price point. "In the past, if I needed to add a user for a given application, I had to first find another user who didn't use that application so I could use the license,"

says Amy Smith, Unified Communications Practice Manager, Nexus. The licensing solution includes Technical Assistance Center support as well as Cisco Unified Communications Software Subscription, which provides major software upgrades for three years at no additional cost. "Cisco Unified Communications Software Subscription is a big advantage because I don't have to continually ask executives to increase the budget for software upgrades," Smith says. "We can count on fixed costs for three years."

Nexus prefers to lease because of its large technology investment, and takes advantage of flexible financing options from Cisco Capital.

Conferencing

Nexus conducts internal meetings with employees in different offices using Cisco Unified MeetingPlace®, which enables voice, video, and web collaboration over the company's wide-area network. "If we're chatting with instant messaging and realize we need to talk, we can just click a button to initiate a phone call," says Smith. "And if we then want to add video or share documents, we just click again to escalate to a Cisco Unified MeetingPlace conference." Smith used Cisco Unified MeetingPlace to train employees on the new features of Cisco Unified Communications Manager 7.0, using video, surveys, and polling to make the training interactive and interesting. The company recorded the training session so that new employees can watch a video on demand. Smith also uses Cisco Unified MeetingPlace for troubleshooting with employees' applications. The web collaboration feature lets her see the employee's desktop to identify and resolve the issue.

For customer meetings, Nexus sales and engineering personnel uses Cisco WebEx to share presentations and documents, and Cisco Unified MeetingPlace for the voice connection.

Unified Messaging

Employees save time by using Cisco Unity® Unified Messaging to play back and manage voicemail from their email inbox. Features in Cisco Unity Unified Messaging 7.0 help employees more quickly respond to requests from co-workers and customers. For example, if the connection drops when employees are listening to voicemail from a mobile phone, they can use dropped call recovery to call back in and listen to the message where they left off. Employees also like the message monitor feature, which lets them listen to voicemail messages as they are being left. "If a manager is having a routine meeting and hears that the message is from a customer with an urgent issue, the manager has the option to accept the call," Reese says. Employees also like the new ability to scroll through visual voicemail messages on their Cisco Unified IP phone display. "Now I can check voicemail even before my PC boots up," says Reese. "Even small time savings every day add up over time."

Cisco TelePresence

Nexus uses Cisco TelePresence™ for weekly departmental meetings, customer meetings, and employee interviews. Customers are enthusiastic about Nexus' Connect to an Expert service, which uses Cisco TelePresence to let them come to the nearest Nexus office to meet face-to-face with an expert in any location. "Cisco TelePresence and our Connect to an Expert program have helped us close new business by bringing in subject matter experts from different locations to understand our customers' needs," Reese says. "And every meeting that an engineer conducts with Cisco TelePresence instead of an airplane trip frees up three or four hours to spend in the field. That enables us to compete with companies whose resources are all in one office.

Mobility

Employees who travel appreciate MobileConnect, a single-number reach application that allows them to answer incoming calls on either the desktop phone or mobile phone, change over to the other phone without losing the connection, and originate enterprise calls from the cellular phone. "MobileConnect saves a tremendous amount of time every day by letting employees dial a single number instead of having to track someone down," says Smith.

New Cisco Unified Mobility features in Cisco Unified Communications Manager 7.0 make it easier for Nexus employees to collaborate across the barriers of time and distance. The new time-of-day routing feature makes MobileConnect single number reach feature even more convenient. "Vendors in other time zones sometimes call at 5:00 a.m. my time," says Reese. "Now I can easily set up the system to only send calls to my mobile phone when I want to receive them."

Contact Center

Nexus uses Cisco Unified Contact Center as the foundation for customer interactions, routing calls to the right resource, the first time. This has helped Nexus earn 4.5 of 5 possible points for customer service in its customer satisfaction surveys.

"In general, businesses focus either on growth or cost control, but not simultaneously. Cisco Unified Communications technology has helped to make Nexus the exception. We have grown 25 percent year over year for the past four years while remaining profitable."
—Steve Reese, Director of Solutions, Nexus

Results

Competitive Advantage

"In general, businesses focus either on growth or cost control, but not simultaneously," says Reese. "Cisco Unified Communications technology has helped make Nexus the exception. We have grown 25 percent year over year for the past four years while remaining profitable." Nexus attributes this accomplishment to the use of technology. "Employees in any workspace can quickly reach out to each other, and our experts can meet face-to-face with customers using Cisco TelePresence," says Reese. "That makes us as nimble as a small, local VAR even though we're spread out in nine markets."

Travel Avoidance

From March to July 2008, Nexus employees conducted 172 scheduled Cisco TelePresence sessions with customers and 786 spontaneous sessions. In those five months, the company saved more than US$108,000, including travel costs and time savings. Travel costs amounted to more than US$30,000, but the time savings have an even greater business impact. "In just five months, Cisco TelePresence saved 1830 hours for sales that otherwise would have been spent traveling," says Reese. "That's worth US$76,400 in salary alone." One of Nexus' solution experts who works out of the San Diego, California office has met with up to half a dozen customers throughout the country in one day, compared to a maximum of two when he had to travel.

Faster Decision-Making

Nexus employees can get answers faster because of presence technology, which displays whether co-workers are available and how they prefer to be reached. "In the past, if I was on a conference call and an employee left a voicemail message with a customer pricing question, I wouldn't hear the request for an hour or more," says Smith. "Now they see from my presence information that I'm on the phone, and can send an instant message for an immediate response." This can result in extra sales if a sales representative can find an answer while on the phone with the customer. Presence and instant messaging capabilities in Cisco Unified Personal Communicator can even prevent loss of revenue because customers who have to wait for a call back might use the time to find another source.

Employee Satisfaction

Nexus employees appreciate not having to travel as much. "Cisco Unified Personal Communicator enables us to collaborate from home as if we were in the office, and with MobileConnect we can receive calls on our cell phones without giving our personal cell phone numbers," says Reese. The option to work from home helps Nexus attract and retain skilled employees.

Reduced Carbon Footprint

Cisco TelePresence, Cisco Unified MeetingPlace, and Cisco WebEx reduce air travel, lowering Nexus' carbon footprint.

Next Steps

As its customers begin upgrading to Cisco Unified Communications Manager 7.0, Nexus plans to adopt federated presence, so that employees in both companies can share presence information and securely send instant messages.

Nexus also plans to take advantage of the open interfaces of Cisco Unified Communications solutions to add more functions to the applications. One idea is to develop widgets for Cisco WebEx so that employees can just click to launch business applications, such as scheduling meetings with people in different companies. The company also plans to use the Cisco Unified Application Environment to develop applications that employees can operate by pressing buttons on their Cisco Unified IP phones.

For More Information

To find out more about Cisco Unified Communications go to: http://www.cisco.com/go/unifiedcommunications

PRODUCT LIST

Switching and Routing

- Cisco Catalyst 6500 and 3560 Switches
- Cisco Integrated Services Routers

Cisco Unified Communications

- Cisco Unified Communications Manager 7.0
- Cisco Unified IP Phones Models 7912G, 7940G, 7941G, 7960G, 7961G, 7970G, 7971G
- Cisco Unified Wireless IP Phones Models 7920, 7921G
- Cisco Unified IP Conference Station 7935G
- Cisco Unity 7.0
- Cisco Unified Presence Server 7.0
- Cisco Unified Personal Communicator 7.0
- Cisco Unified Workspace for Partners
- Cisco Unified Communications Software Subscription
- Cisco Unified MeetingPlace
- Cisco Unified Mobility
- Cisco Unified Contact Center Enterprise 7.5
- Cisco IP IVR 5.0

Collaboration

- Cisco WebEx
- Cisco Digital Media System
- Cisco TelePresence

Security

- Cisco Adaptive Security Appliance 5520
- Cisco Network Admissions Control
- Cisco Security Monitoring, Analysis, and Response System
- Cisco Intrusion Prevention System

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Item 8.
CISCO Healthcare Company Improves Communications For Dispersed Employees, © 2008 Cisco Systems, Inc.

Customer Case Study

Global Healthcare Company Improves Communications for Dispersed Employees

Baxter Healthcare Corporation uses Cisco TelePresence to enable face-to-face communication.

EXECUTIVE SUMMARY
BAXTER HEALTHCARE CORPORATION • Healthcare • 46,000 + Employees
BUSINESS CHALLENGE • Enable effective communication and collaboration among globally dispersed teams • Accelerate decision making
NETWORK SOLUTION • Deploy Cisco TelePresence technology to enable "virtual" collaboration that is as effective as face-to-face meetings
BUSINESS RESULTS • More effective collaboration • Reduced time required for troubleshooting, decision making, and go-to-market • Reduced travel costs

Business Challenge

Baxter Healthcare Corporation assists people with some of the most complex medical conditions, such as hemophilia, cancer, immune disorders, and kidney disease. With more than 46,000 employees and manufacturing facilities in 26 countries, Baxter is a global enterprise with 2007 sales in excess of US$11 billion.

Baxter depends on the abilities of its teams to communicate and collaborate effectively. Engineers and quality assurance personnel work with research and development (R&D) specialists and other partners to develop and refine products. Often, team members are located around the globe, yet they must collaborate effectively on a wide variety of projects to meet business goals and ensure quality of patient care.

All across the company, high-quality communication and effective collaboration are vital to Baxter's mission. With manufacturing plants, R&D facilities, partners and clinical experts located throughout the world, Baxter's globally dispersed teams must be able to share their vision and ideas clearly and solve problems efficiently.

The global nature of Baxter's business means that its employees face communication challenges daily. Traditional conference calls and teleconferences were not meeting teams' needs for immediacy and clarity, and teams were finding it difficult to compensate for cultural barriers over small-screen video with poor resolution. Faced with rising travel costs and some technological limitations related to existing infrastructure, Baxter needed a solution that would deliver the benefits of in-person meetings, thereby facilitating faster troubleshooting, decision-making, and go-to-market capabilities.

Network Solution

One way that Baxter addressed its global communication challenges was with an initial deployment of six Cisco® TelePresence™ meeting rooms. Cisco TelePresence combines high-quality audio, high-definition video, and interactive elements to deliver an in-person meeting experience over Baxter's network no matter where participants are located. Cisco installed the first units at Baxter's main campus sites, focusing on users in R&D, manufacturing, and marketing.

The company discovered that Cisco TelePresence adds important depth to meetings. "Our quality assurance organization has discovered that TelePresence is ideal for important face-to-face meetings involving distributed teams," says Ron Chase, vice president of IT for Baxter's BioScience business. According to Chase, Cisco TelePresence meetings help bridge the cultural divide by providing the ability to see and feel human interaction. Attendees gain additional insights through the "in-the-room" experience enabled by Cisco TelePresence.

Baxter's quality assurance (QA) teams use Cisco TelePresence for staff meetings and one-on-one discussions among managers. Using visual cues delivered by ultra-high-definition video (1080 progressive scan) on large plasma screens, QA teams have a clear understanding of the commitments and plans for which they are responsible.

Cisco TelePresence also helps Baxter develop new products and perfect existing ones. Using Cisco TelePresence, Baxter's R&D organization conducts working sessions between developers and project managers in Austria and California, for example, taking advantage of virtual, face-to-face interaction to quickly troubleshoot defects, perfect designs, and make decisions efficiently. Because of the immediacy of Cisco TelePresence, teams understand problems much more quickly and can talk through them to find creative solutions, benefits that they had not experienced with traditional teleconferencing. During one Cisco TelePresence session, engineers and quality control staff worked together on a problem with a product component. Being able to share a life-size image of the component with the whole team on the call introduced an entirely new dimension to the meeting. The team quickly gained complete understanding of the issues and rapidly resolved the problem.

Training personnel now use Cisco TelePresence to show training videos about Baxter products to physician consultants, who review, critique, and help modify them. Such collaboration is not possible on poor-resolution or desktop video, and the traditional method has been to fly all of the consultants and video personnel to one location.

> "TelePresence has enabled faster decision making and problem solving among groups who use it. It's streamlining the way projects move through the system."
> **—Ron Chase, Vice President of IT, Bioscience, Baxter Healthcare Corporation**

Business Results

Some of the business benefits of Cisco TelePresence were immediate: communication among globally distributed team members improved; misunderstandings due to cultural differences decreased; better collaboration created a new immediacy that led to faster problem solving and greater creative synergy. In fact, some teams plan to use Cisco TelePresence instead of conference calls for staff meetings because of the effective troubleshooting that it allows.

These immediate communication and collaboration benefits enabled greater R&D productivity and shorter go-to-market time. Baxter's hiring process also benefited from the technology as managers now have the ability to interview candidates using Cisco TelePresence and avoid the missteps and incomplete impressions that can occur over the telephone.

The quality of the interaction using Cisco TelePresence has enabled Baxter to reduce travel costs. When effective meetings are possible with team members in multiple locations, people feel less compelled to travel.

Lessons Learned

To help ensure maximum benefit from a Cisco TelePresence investment, Will O'Shea, Cisco TelePresence program manager, recommends an internal marketing campaign and ongoing training to show employees the possibilities of the new technology. This campaign should help ensure that as many targeted users as possible have the opportunity to use Cisco TelePresence so they can truly understand the experience. Companies can also maximize the product's value by creating and enforcing a travel policy that focuses on Cisco TelePresence use whenever possible, and targeting internal marketing communications to the most frequent travelers between Cisco TelePresence-equipped locations.

Baxter's experience also shows that a user's first-time experience is crucial. Switching to Cisco TelePresence involves changing the mindset and culture of a company. Humans are naturally resistant to change, however, and users are often accustomed to telephone and email in preference to meetings or teleconferencing. If these users do not have a good experience the first time, they could resist using Cisco TelePresence indefinitely.

Ron Chase and others who have used Cisco TelePresence are optimistic about its future role at Baxter. They anticipate a time when Cisco TelePresence equipment will be easily accessible in even more locations at Baxter, as well as in locations of its customers and suppliers. With fewer obstacles due to distance and miscommunication, Baxter can execute its mission more effectively and continue to improve the healthcare of individuals around the globe.

For More Information

To find out more about Cisco Telepresence, go to: http://www.cisco.com/go/telepresence.

Item 9.
Westside Subway Study is Defective, THE MANHATTANIZATION OF LA, by Richard Lee Abrams, © 9-10-10 CityWatch los Angeles, CA

Westside Subway Study is Defective

THE MANHATTANIZATION OF LA

Richard Lee Abrams

The Environmental Impact Report for the Westside Subway has been released. Its cost will be $10 Billion. The EIR concludes that at best the Westside Subway will reduce traffic congestion by 1%. As a county project, it will serve 4/100th of 1% of the county. If we serve the entire County with a subway system that's $2,000,000,000,000,000 ($2 Trillion). That is $202,979.00 for each person in L.A. County. What is so wonderful that we should continue down this path? The main goal of the subway project is "to meet the increasing travel demand." The EIR also has sub-goals: 1) improve mobility and travel reliability, 2) improve access to major activity and employment centers, (iii) provide fast, reliable and environmentally sound transit alternative, etc. (EIR § 1.1, p1.1)

One has to seriously question whether a 1% improvement in traffic congestion achieves these goals. The EIR admits that subways serve only one-half mile on either side of the subway. One problem with subways is that they are fixed in one spot for decades upon decades. They have zero flexibility.

When people refuse to live in the tenements which the developers want to build along the subway route, the rider ship will not be large enough to support its operation. The subway's operating costs will become another drain on the County and City tax base, which will have already shrunk into insolvency as all the CRA projects will have taken billions more dollars of more property off the tax rolls.

Are there alternatives to the Westside Subway? Yes!

Does the EIR consider all of them? No!

Virtual Presence [VP] is the ability to be functionally wherever we wish to be without physically going there.

Right now most of us have heard about the Model T version of Virtual Presence, Tele-Commuting. Corporations have employees sit in a conference room, while Mr. Big lectures them from some remote location.

Another version is where professionals, .e.g. lawyers, refuse to drive an hour to their downtown offices, but instead stay at home writing their briefs. At $500/hr, that can save $1,000 of billable time per day. Tele-commuting is for the most part the creating of information at one place and electronically sending it to another place or vice versa.

These are but rudimentary forays into the new world of Virtual Presence. Tele-commuting has not left the stage of information sharing. As it is mostly under the control of corporate big shots, tele-commuting's morphing into Virtual Presence has been retarded. As the technology improves with life size 3-D monitors and enhanced sound, we will create the Illusion of Presence.

The **Illusion of Presence** along with price reduction that comes with all technological advances will free Tele-commuting from the strangle hold of a few corporations and let everyone participate. That day will be Virtual Presence's birthday! A mother in Atlanta can go VP shopping with her daughter in Encino at a cyberspace Macy's.

Rather than the present on-line shopping, both mother and daughter will log on to the same trip from their homes thousands of miles apart and walk through a Virtual Macy's store together.

At the same time, they can see each other and the store's aisles on their life-size monitors. As they stroll down the aisles, they can reach out, select an item, rotate it, read the labels, etc. They can discuss the pro's and con's of the item just as if they were physically next to each other.

How many freeway trips can be saved with Virtual Presence technology? 30% is a reasonable estimate. The reduction will be drastic because the need to be physically present in a particular place is much over-rated.

Today, I had to attend a 10 minute meeting in Rancho Cucamonga and then another one in San Bernardino. Because I left after morning rush hour and returned before mid-afternoon, I could travel at full speed. But, there was no logical need for my physical presence in either place. The problem is none of us had Virtual Presence technology.

Virtual Presence is beyond inter-active. The Illusion of Presence provides a psychological dimension which people overlook. While people can talk on the phone and fax papers and even use their tiny computer cameras, these devices do not provide the psychological satisfaction of "being there." The Illusion of Presence is the essence of VP.

Because subways are forever, the Westside Subway EIR has to take into account the impact of new transportation systems that can be operable in ten years. The EIR ignores Virtual Presence, despite the fact that VP fulfills all the legitimate goals of the Westside subway.

The only goal Virtual Presence does not accomplish is provide a rational to destroy all the residential neighborhoods from 1 Wilshire to the Santa Monica pier. Because subways are so horrendously expensive to operate, those tunnels have to be full with trains every 3/5 minutes.

The density along Wilshire Boulevard is not great enough and we know that the affluent who live in Hancock Part and on Palm and Oakhurst in Beverly Hills won't be avid users. Thus, the Westside subway calls for the creation of mega-dense centers, e.g. Crenshaw and Wilshire and then for a feeder line down Crenshaw, which will similarly become a high rise corridor.

All those residential areas need to be destroyed in order to create a sufficiently large sub-class of poor people who will be dependent on the subway.

The need to Manhattanize Los Angeles in order to pay for the subways is one of their worse features. It won't do any good to construct high rises at the top of The Oaks as they are more than ½ mile from a freeway.

The R-1 neighborhoods in the Flats need to be cannibalized in order to crowd 66,000 ppl per sq. mi. in high rises lining Wilshire Boulevard. The high rises have to cater to the poor as the wealthy will not use the subways.

When VP is ubiquitous, there is no need to demolish our R-1 neighborhoods to build high rises and special centers of super-uber-mega density like Wilshire-Crenshaw. The cost will be first be borne by the affluent, and as more and more people purchase the equipment, the cost will fall so that all homes will have one, two, or three VP centers – just like they have multiple color TV's.

Virtual Presence frees each person to go anywhere in the world like Star Gates allow people to go anywhere in the universe. One minute you can be conferencing with your partner in Milan and the next you can be visiting your Dad at his home in Bronx as he had a heart attack a week ago. Then you can be at Target to buy a new coffee maker and have it sent to your home in Cheviot Hills. You can do all this in the time it would take you to walk to a subway.

The construction of more subways in Los Angeles County needs a moratorium in order to study our present mind set before we squander tens of billions of dollars and destroy the urban centers. The study needs to focus on two general areas:

(1) The extent to which Virtual Presence makes additional physical transportation infra-structure foolishly unnecessary.

With a 30% reduction in traffic congestion, we do not need to build any more roads. The sole problem with our present transportation system is density – too many people using the same roads at the same time. With 30% fewer users, the freeways and streets will move at optimal speed. That means busses will so travel at a decent rate of speed.

(2) The extent to which Virtual Presence will allow the talented to move away from decaying urban areas.

VP is coming. If we delay its arrival until after we've decimated our city, we will have spent a trillion dollars to create a huge under-class. We've done this before.

After WW II, the urban cores decayed as the middle class fled to the suburbs. Virtual Presence can cause a similar exodus from crowded urban centers with their crime and bad schools. Crowding is physically harmful and results in a multitude of social ills.

Cities which preserve their R-1 residential neighborhoods, however, will have a chance to survive. Los Angeles, especially Hollywood, is rapidly destroying its single family neighborhoods so that when VP becomes widespread, Hollywood will be abandoned just as the city centers were deserted after WW II.

If the City stops the destruction now and preserves these R-1 residential areas, then in 5 to 10 years when VP becomes common, Los Angeles will be one of the few livable urban areas. Since the late 1800's, Los Angeles has been distinguished from other major American cities by its vast expanse of R-1 neighborhoods. Once Virtual Presence removes the congestion, Los Angeles itself will become an extremely desirable place to live.

Because Virtual Presence satisfies all the EIR's legitimate transportation goals infinitely better than any subway, the Westside Subway's EIR is fatally defective.

Transportation is no longer the exclusive domain of mega-construction companies who lay miles and miles of fixed-rails and pour tons upon tons of concrete and of their cronies who destroy everything within a ½ mile on either side.

As we look towards the 22nd Century, we cannot ignore new transportation technology of VP. Nor may the Westside Subway EIR turn a blind eye.

Item 10.
Virtual Presence is Upon Us, IS LA OBSOLETE,
by Richard Lee Abrams,
© 9-03-10 CityWatch Los Angeles, CA

Virtual Presence is Upon
IS LA OBSOLETE?
Richard Lee Abrams

The rate at which ideas become obsolete is amazing. Even the word obsolete has become obsolete.

Let's face it, my mother's computer may be four years old, but it is not obsolete – for her. For me ...I've got to rush home from Fry's to quickly install my newest computer knowing that by the time it's running, the first article I read will explain why my computer is now obsolete.

Here's a concept that became obsolete before it came to fruition – Tele-commuting. I used it last week and now it is being replaced by "Virtual Presence." Dare I call it VirPre or VP? No wonder Twitter is limited to 140 characters; anything longer is too old to be worth saying.

Virtual Presence is the ability to be functionally wherever we wish without going there. Today's version, Tele-commuting, is like the hand-crank phone in comparison to VP.

VP couples low-cost life-size 3-D monitors with high speed 'pdfers' with drastically enhance sound so that when you are next to your VP screen, you can interact with your son at college – assuming you can get him to turn on his camera knowing it is Dad and Mom who are veeping him.

Studies show that families do like each other and given an opportunity, they like to interact.

Unlike Tele-commuting, VP is not limited to business. But, businesses will habitually use it. The ability to truly interact will be so greatly enhanced, that it will be almost as good as actually being in the same room. With VP, however, a manager can be in Denver one moment and in Costa Rica the next. Let's see a 10 billion dollar subway do that!

What do we want to do with our money? Do we really want to give trillions more dollars to mega-corporation to construct 19th Century choo-choo trails running beneath LA?

In the LA metro area, the distance between two places varies according to the time of day.

During rush hour, downtown can be an hour away from Van Nuys, but a 11:00 p.m., it's 20 minutes. Angelenos have all the transportation infra-structure that we need.

We do not need another inch of freeway and we certainly do not need to squander billions on an idiotic subway beneath Wilshire Boulevard. A 20 mile long subway from downtown L.A. to Santa Monica will serve only 4% of the City of Los Angeles. Is that worth another $10 B in our money?

And what will we have when the subway is done? – a few corporations will be vastly richer.

VP eliminates the need to dig these deep holes and to pour all this concrete. The only reason people in 2010 think it might be a good idea is that traffic is so congested all the time that it is hard to get from here to there.

When 30% of the trips are taken by VP, the streets and freeways will be humming. Buses will move faster. The cities with the lowest density will be the most desirable.

Virtual Presence frees us from the tyranny of physically moving our bodies by expensive mechanical means. If people were really concerned about reducing our dependence on foreign oil, they stampede their way to Virtual Presence. With VP oil consumption will plummet.

Without investment in 22nd Century technology, VP will be postponed. Just as Wall Street has sucked up all the capital since 2008 so that Main Street is loan-starved, the fixed rail international construction companies and the mega-developers are draining investment capital of every cent in order to stop Virtual Presence.

That is why LA is applying so much pressure to build high rise NOW – that's the motivation behind the 30/10 Plan to construct 30 years of fixed rail transit in 10 years. Within 10 years, Virtual Presence will be upon us and no one would be dumb enough to build a subway.

We Angelenos need to ask whether we want to squander billions more of our tax dollars in order to saddle ourselves with technology from the 1800's or whether we want to move towards the 22nd Century.

(Richard Lee Abrams is an attorney in Los Angeles and a contributor to CityWatch. He can be reached at : rickleeabrams@gmail.comThis email address is being protected from spam bots, you need Javascript enabled to view it) -cw

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Item 11.
MASS TRANSIT: The Great Train Robbery, by Joel Kotkin , © August 10, 2010 NewGeography.com

The Great Train Robbery

LA MASS TRANSIT

Joel Kotkin

(NewGeography.com)

Last month promoters of the Metropolitan Transit Authority's Los Angeles rail projects, both past and future, held a party to celebrate their "success." Although this may well have been justified for transit-builders and urban land speculators, there may be far less call for celebration among L.A.'s beleaguered commuters. Despite promises that the $8 billion invested in rail lines over the past two decades would lessen L.A.'s traffic congestion and reshape how Angelenos get to work, the sad reality is that there has been no increase in MTA transit ridership since before the rail expansion began in 1985.

Much of the problem, notes Tom Rubin, a former chief financial officers for the MTA's predecessor agency, stems from the shift of funding priorities to trains from the city's more affordable and flexible bus network. Meanwhile, traffic has gotten worse, with delay hours growing from 44 hours a year in 1982 to 70 hours in 2007.

Sadly, this situation is not unique to Los Angeles. In cities across the country where there have been massive investments in light rail--from the Portland area to Dallas and Charlotte, N.C., and a host of others--the percentage of people taking transit has stagnated or even declined. Nationwide, the percentage of people taking transit to work is now lower than it was in 1980.

None of this is to argue that we should not invest in transit. It even makes sense if the subsidy required for each transit trip is far higher than for a motorist on the streets or highways. Transit should be considered a public good, particularly for those without access to a car--notably young people, the disabled, the poor and the elderly. Policy should focus on how we invest, at what cost and, ultimately, for whose benefit.

In some regions with large concentrations of employment, downtown major rail systems often attract many riders (although virtually all lose lots of money). The primary example would be the New York City area, which is one of only two regions (the other being Washington, D.C.) with over one-fifth of total employment in the urban core. In the country as a whole barely 10% of employment is in the city; and in many cities that grew most in the 20th century, such as Dallas, Miami, Los Angeles and Phoenix, the central business district's share falls well under 5%.

Some other urban routes--for example between Houston's relatively buoyant downtown and the massive, ever expanding Texas Medical Center – could potentially prove suitable for trains. But most transit investments would be far more financially sustainable if focused on more cost-efficient methods such as rapid bus lanes, which, according to the Government Accountability Office, is roughly one-third the cost of light rail.

Making the right choices has become more crucial during the economic downturn, even in New York City. The city and the federal government continue to pour billions into a gold-plated Second Avenue subway but now plan to cut back drastically on the bus service that serves large numbers of commuters from the outer boroughs and more remote parts of Manhattan.

Ultimately the choice to invest in new subways and light rail as opposed to buses reflects both a class bias and the agenda of what may best described as the "**density lobby**." The people who will ride the eight-mile

long Second Avenue subway, now under construction for what New York magazine reports may be a total cost of over $17 billion, are largely a very affluent group. **The new subway line will also provide opportunity for big developers to build high-density residential towers along the route.** In contrast, the bus-riders, as the left-of-center City Limits points out, tend to be working and middle class residents from more unfashionable, lower-density districts in the Bronx, Queens, Brooklyn and Staten Island.

The proposals for High Speed Rail--a favorite boondoggle of the Obama administration and some state administrators – reveals some of the same misplaced fiscal priorities. California's State Treasurer, Democrat Bill Lockyer, has lambasted the proposed HSR line between Los Angeles and the Bay Area, suggesting the state may not be able to sell private investors on between $10 billion and $12 billion in bonds without additional public subsidies.

Other prominent Democrats as well as the State Auditor's office have challenged the promoters' claims about the viability of the system and its potential drain on more reasonable priced transit project.

This issue funding priorities was raised recently by the current administrator of the Federal Transportation Authority, Peter Rogoff, who questioned the wisdom of expanding expensive rail and other transit projects **when many districts "can't afford to operate" their own systems.** He noted that already almost 30% of all existing "transit assets" are in "poor or marginal condition."

Ultimately we need to ask what constitutes transit's primary mission: to carry more people to work or **to reshape our metropolitan areas for ever denser development.** As opposed to buses, which largely serve those without access to cars, light rail lines are often aimed at middle-class residents who would also be potential buyers of high-density luxury housing. In this sense, light rail constitutes a critical element in an

expanded effort to reshape the metropolis in a way preferred by many new urbanists, planners and urban land speculators.

The problem facing these so-called visionaries lies in the **evolving nature of the workplace** in most parts of the country, where jobs, outside of government employment, are increasingly dispersed. Given these realities, transit agencies should be looking at innovative ways to reach farther to the periphery, in part to provide access to inner-city residents to a wider range of employment options. Considering more than 80% of all commuter trips are between areas outside downtown, priority should be given to more flexible, less costly systems such as rapid commuter bus lines, bus rapid transit, as well as subsidized dial-a-ride and jitney services that can work between suburban centers.

If reducing energy use and carbon emissions remains the goal, much more emphasis should be placed as well on **telecommuting**. In many cities that have invested heavily in rail transit--Dallas, Denver and Salt Lake City, for example – **the percentage of people working from home is now markedly larger than those taking any form of mass transit**. Since the approval of the Dallas light rail system in the 1980s, for example, the transit share of work trips has dropped from 4.3% to 2.1%; the work-at-home share has grown from 2.3% to 4.3%.

In fact, **people who work from home now surpass transit users in 36 out of 52 metropolitan areas** with populations over 1 million – and receive virtually no financial backing from governments. Yet if New York, home to roughly 40% of the nation's transit commuters, was taken out of the calculations, **at-home workers already outnumber the number of people taking transit to work**; and since 2000 their numbers have been growing roughly **twice as fast** as those of transit riders.

Clearly we should not spend our ever more scarce transit resources on a nostalgia crusade to make our cities function much the way they did in the

late 1800s. Instead, we need to construct systems reflecting the technology and geographic realities of the 21st century and place our primary focus on helping people, particularly those in need, find efficient, economically sustainable ways to get around.

This article originally appeared at Forbes.com.

Joel Kotkin is executive editor of NewGeography.com and is a distinguished presidential fellow in urban futures at Chapman University. He is author of The City: A Global History. His newest book is The Next Hundred Million: America in 2050, released in Febuary, 2010.