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Telework: Saving Gas and Reducing Traffic from the Comfort of your Home

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Today's mobile technologies make it easier than ever for people to work from anywhere. These advances, combined with concerns about traffic congestion, oil's inordinate strategic importance, and the environmental impact of driving appear to create a "perfect storm" for the expansion of telecommuting. However, a few outdated legislative barriers are holding back the more widespread use of telecommuting. A well-targeted and thoughtful approach to removing these barriers can reduce congestion and the need to use oil, while providing economic benefits to businesses, individual employees, and entire regions.

A few simple legislative reforms, particularly around taxation, can make telecommuting a viable option for millions of Americans. Commuters stand to save billions on transportation expenses and employers can hire from a broader pool of potential employees, all while reducing our nation's vulnerability to oil price shocks and helping the environment. **Even a modest expansion of telecommuting could save Americans a total of \$1.9 billion annually and reduce oil demand by 20 million barrels of oil per year.**

This whitepaper lays out the case for increasing public efforts to expand telecommuting. Part One will define telecommuting and provide estimates of the numbers of current, and potential, American telecommuters. Part Two will review the benefits of telecommuting from the perspectives of economy, energy and security, and the environment. Part Three will outline the main obstacles to a wider adoption of telecommuting, and will provide a number of recommendations to expand it.

What Is Telecommuting and Who Does It?

The concept of "telework" or "telecommuting" is nearly 40 years old; the term was first coined by a U.S. Air Force rocket scientist named Jack Nilles in 1973. How telecommuting is defined, and who is considered a telecommuter, are important when analyzing its impacts and benefits. Scholars recommend addressing the following questions when determining who is a telecommuter.¹

- **What kind of worker is being counted?** Not everyone who works at home, or can work at home, is a telecommuter. Home-based businesses abound, as do independent contractors. In this report, which looks at telecommuting as a means to reduce congestion and save oil, the definition is limited to those workers who work outside the home and *but for the option to telecommute*, would be commuting to a worksite. This definition distinguishes actual telecommuters from other groups who may use telecommunications for their work and/or have no commute, most notably home-based businesses and workers.

- **How often must a worker telecommute to be a “telecommuter?”** Few workers employed outside the home telecommute five days a week, yet should a worker who telecommutes once per month really be considered a “telecommuter?” Academic studies that survey typical telecommuting frequency find a range across years and geographical areas of 0.9 to 1.4 days per week. For the purposes of this study, a telecommuter is someone who works at home, instead of commuting to work, an average of two days *per month*.ⁱⁱ This yields a conservative, yet plausible, estimate as to the impact and benefits of expanding telecommuting.
- **How long must someone telecommute to be a “telecommuter?”** Once someone begins telecommuting, there is no guarantee that they will continue to telecommute with the same frequency for the rest of their careers. Indeed, at least one study has shown that dropping out of telecommuting programs is quite common.ⁱⁱⁱ This report does not account for telecommuting variation, instead relying on averages and aggregated data to determine impacts, which seems reasonable since the overall number of telecommuters has actually remained quite steady (meaning that for every telecommuter who drops out, another one starts up). Nevertheless, understanding this tendency of workers to explore telecommuting temporarily is an important consideration for designing effective incentives and programs.

Surveys and studies over the past two decades have provided snapshot demographic information about those workers who are most likely to be able to telecommute, choose to telecommute, and continue to do so. One such survey, from the Southern California Association of Governments, contained relatively detailed demographic information and benefited from excluding home-based workers. Analysis of the survey revealed:^{iv}

- **Demographic variables matter.** Workers are more likely to telecommute if they are more than 30 years old or have another adult in the household. Having young children in the household increases telecommuting, but in households with children over 6 years old (i.e., school-age), having children in the household has no effect on telecommuting. The single most significant demographic variable is having a college degree.
- **Industry and job-related variables matter more.** Workers in small (fewer than 25 employees) companies and those in large (250 employees plus) companies are more likely to telecommute than those in medium-sized businesses (25 to 249 employees). Workers in service-oriented, salaried, professional positions where work need not be face-to-face are most likely to telecommute. These job types include architecture and engineering, education and training, sales, and middle and upper management.

How Many (Actual and Potential) Telecommuters Are There?

Estimating the market for telecommuters can be a difficult task. Nevertheless, there is enough information to provide an order-of-magnitude estimate of the potential market. The 2009 National Household Travel Survey collected data on whether respondents had an option to work at home, and whether and how often respondents worked at home in the last month.^v Applying these results to Bureau of Labor Statistics data can give us a snapshot of the current number of U.S. workers who would meet the two days per month threshold set out above as a definition of a “telecommuter.” (Figure 1)

Figure 1: Number of Telecommuters, 2010

| | |
|--|------------------|
| Current Non-Farm, Non-Self Employed Workers | 114,004,000 |
| Those With Option to Work at Home | 9,690,340 |
| Those Who Worked at Home at Least Twice Per Month | 5,244,184 |

Source: National Household Travel Survey, 2009; Bureau of Labor Statistics, 2010

The good news for the expansion of telecommuting is that there is a ready pool of workers who are already permitted by their employers to work at home. Now, it is important to note that even those workers with the option to work at home may not easily exercise it. Individual firms or managers may tacitly discourage telecommuting even where it is permitted by policy. For the purposes of this paper, however, we will utilize the 9.6 million number in our analysis. We hope the recommendations included herein will increase that number significantly in the coming years.

The Many Benefits of Telecommuting

Telecommuting gives employees the flexibility of working from home, reduces transportation costs, stands as a competitive benefit for businesses to attract employees, takes cars off the road to reduce peak congestion, and cuts vehicle travel, reducing the imperative to use oil and pollution.

Employer and Employee Benefits

For employees, the primary economic benefit of telecommuting is saving on commute-related expenses (gas, tolls, parking and other costs). Telecommuters have longer commutes than average workers^{vi} (17.5 miles vs. 14.7 miles), so each day of telecommuting provides greater-than-average economic benefits. An average telecommuter (again, telecommuting twice per month) will save \$169 per year in auto-related costs alone (gas, maintenance and tires), with each additional day saving a little over \$7,^{vii} not counting savings from tolls or parking. Many auto insurance carriers also offer lower premiums to frequent telecommuters. Although other benefits are difficult to quantify, employees who telecommute also enjoy greater freedom and flexibility in their work and home life, fewer sick days, and reduced stress levels.^{viii}

Telecommuters can save employers money as well. As more employees telecommute, companies can cut back on expenses for workspace, parking, and energy use. Case studies of more than fifteen employers in the Puget Sound area that offer telecommuting options, including Hewlett-Packard and Macy's, reveal happier, more productive employees, with telecommuting attributable to increased attraction and retention of quality employees.^{ix} Forty percent of IBM's employees telecommute, saving nearly \$2.9 billion in reduced office space needs (and millions more on energy costs) since 1995.^x Telecommuting also permits businesses to de-concentrate their resources, leaving them less vulnerable to power outages, workplace illness or direct attack, and more nimble and better able to recover and continue operations after calamities. All federal agencies are encouraged to include telecommuting in their Continuity of Operations programs.^{xi}

For regions, the economic benefits of telecommuting derive from decreased congestion. The Texas Transportation Institute's annual Urban Mobility Report lays out the cost of congestion in terms of wasted time and wasted fuel, finding that the average American spends the equivalent of a full workweek stuck in traffic every year, wasting \$100 billion in time and fuel.^{xii} In the top 15 very large urban areas (such as Chicago and Houston) the average commuter uses 39 excess gallons of fuel and spends \$1,166 in extra congestion costs.^{xiii} By taking more than 4.7 million cars off the road every day, telecommuting already has a positive effect on congestion. More telecommuting should deliver further improvements in urban mobility.

Increased Resilience and Environmental Benefits

While telecommuting benefits individual employees and companies, it also provides society-wide benefits such as reducing the importance of oil and cutting transportation pollution. When people can get to work without getting in their car, the nation's overall vulnerability to oil price volatility is reduced.

How much oil do telecommuters already save? The average telecommuter's normal on-road round-trip commute is 35 miles. Using current average fuel economy standards, telecommuters save 40.6 gallons of oil per year by telecommuting just twice per month, which, along with reduced operating costs, translates into an annual cost savings of \$169. As there are 5.2 million Americans who currently telecommute twice per month, a rough calculation shows that telecommuters currently save **10 million barrels of oil per year**. This reduction in oil use means lower greenhouse gas emissions and other environmental effects.

Certain factors should be considered when making such an estimate. Telecommuters do usually drive somewhere during the business day, although not so much as to nullify the benefits of the elimination of their commute.^{xiv} On the other hand, the 10 million barrels of oil does not include those who telecommute an average of only one day per month (another 125,000 employees), or those who may occasionally do so due to illness, managerial needs, or scheduling issues.

Expanding Telecommuting: Obstacles and Recommendations

Obstacles

Telecommuting is not for everyone. There is always work that must be done on-site and face-to-face. However, millions of American workers have the option of telecommuting and choose not to, and likely millions more would benefit from at least occasional telecommuting. Why isn't telecommuting more widespread, and what policies and programs can encourage more of it?

The barriers to telecommuting run the gamut from individual and managerial attitudes (especially concerns about work performance) to tax policy, employment law, and local land use. In 2001, the then-General Accounting Office laid out a number of obstacles employers face in implementing telecommuting.^{xv} These included:

- Concerns about managerial supervision of remote work, particularly with regards to company privacy and security;

- Uncertainty regarding telecommuting and state tax laws. Does a telecommuter create a “physical presence” in a state for their employer? In which state should a telecommuter pay taxes related to their employment if they telecommute from another state?
- Concerns about the application of workplace health and safety laws, wage and hour laws, and workers’ compensation, and;
- Concerns about the cost of providing telecommuting equipment and its tax treatment (e.g., is it a fringe benefit?).

Additionally, formalized telecommuting could run into local land use restrictions on home offices or businesses in residential neighborhoods.

Any effort to significantly expand telecommuting must address these issues. Over the years, Congress has repeatedly undertaken efforts to eliminate double taxation of interstate telecommuters, and has yet to finish the job.^{xvi} The National Broadband Plan also recommends addressing this issue.^{xvii} Over and above taxes for employees, the tax implications of telecommuting for employers must also be addressed. The Occupational Safety and Health Administration (OSHA) has clarified that it will not presume injuries sustained during telecommuting are work-related and that they do not inspect, nor intend to inspect, home offices.^{xviii}

Recommendations

The vast majority of applicable workplace regulations was developed in the pre-telecommuting era and still assumes unified, physical worksites. It’s time to revisit these outdated rules. Congress could ease the way for more telecommuting with a **single piece of legislation** that would remove unnecessary obstacles from employers considering telecommuting.

The highest priority items are the elimination of double taxation for interstate telecommuters and clarification of applicable employment laws. Tax treatment of telecommuting infrastructure should also be clarified.

As a complement to the removal of barriers, policymakers can also encourage telecommuting through new policies and programs. For example, the Renewable Energy, Fuel Reduction and Economic Stabilization and Enhancement Act of 2007 authorized the Secretary of Energy to award grants to states with the express purpose of encouraging telecommuting to reduce congestion. All levels of government can encourage or require that contractors offer telecommuting options, assuming this does not increase cost to taxpayers, where appropriate. Tax policy can encourage telecommuting either through direct tax credits or by favorable tax treatment (accelerated depreciation, for example, of telecommuting equipment and infrastructure).^{xix}

The federal government is in a particularly strong position to encourage telecommuting. Not only do federal employees make up 15 percent of the American workforce, but, since 2000, federal policy has mandated the provision of telecommuting options to eligible employees. Implementation has been slow (although 60 percent of federal employees are considered eligible, only 5.24 percent telecommute), but a renewed commitment by the federal government could prime the pump for businesses exploring telecommuting and businesses

serving telecommuters.^{xx} The Telework Enhancement Act of 2010, enacted last December, takes a big step in the right direction by requiring that agencies designate a “Telework Managing Officer,” determine and notify which employees are eligible for telework, and set up an interactive telework training program. Rapid implementation of this new law, as well as additional policy to increase telecommuting, would provide a model for other large employers.^{xxi}

Getting to Work...From the Comfort of Our Homes

Mobile technology is giving employees unprecedented geographical freedom in their work while expanding the pool of employees upon which businesses can call. This new, virtual mobility can be strategically harnessed to reduce our vulnerability to oil price spikes, cut congestion, improve the environment, and expand the mobility of American workers and businesses.

The payoff for such an effort would be significant for economic resilience and the environment, with a modest price tag. Although some estimate that telecommuting would reduce total vehicle miles traveled by no more than 2 percent, public transit provides a similar reduction in the short term at a significantly higher cost.^{xxii} Other estimates are rosier, with expanded telecommuting and other employer-based programs providing more than 250 million metric tons of greenhouse gas reductions by 2050 at a net cumulative savings of \$110 billion.^{xxiii} If the ten million Americans that currently have an option to telecommute (slightly less than double the current number of telecommuters) actually did so at least twice per month, telecommuting could save 21 million barrels of oil annually and save American households a total of \$1.7 billion per year. As those who currently telecommute are more likely to already have the technology, schedules, and management approval to do more, it may turn out to be easier for those individuals to increase the frequency of their telecommuting than it is for non-telecommuters to start doing so. If the 5.65 million Americans who already telecommute at least once per month did so an average of once per week, it would save a total of 23 million barrels of oil each year, with employees saving \$1.9 billion per year in commuting expenses. These, again, are conservative estimates.

Unlike major investments in roads, rail, cars and trolleys, telecommuting is a congestion reduction and economic resilience strategy available *today*. The infrastructure is already in place and the practice is already common. What government can do is remove unnecessary barriers to permitting telecommuting, incentivize and showcase quality telecommuting approaches and programs, and serve as a model itself in promoting telecommuting. Dramatic expansion of telecommuting is a smart, easy choice that will pay big dividends for working Americans, our national security and readiness, and the environment.

*The Mobility Choice Coalition focuses on fiscally responsible, free market oriented approaches to expanding competition among transportation modes
Visit us on the web at www.MobilityChoice.org*

- ⁱ Mokhtarian, Patricia L, Salomon, Ilan, & Choo, S. (2005). Measuring the unmeasurable: Why can't we agree on the number of telecommuters in the US?. *Quality & Quantity*, 39(4), 423 - 452. UC Davis: Retrieved from: <http://escholarship.org/uc/item/7mb104c1>
- ⁱⁱ See Joanne Pratt, "Teleworkers, Trips, and Telecommunications: Technology Drives Telework, But Does It Reduce Trips?" *Transportation Research Record* 1817, 2003.
- ⁱⁱⁱ Varna, et al "Duration and Frequency of Telecenter Use: Once a Telecommuter, Always a Telecommuter?" *Transportation Research C* 6: 47-68, 1998. See also Mokhtarian and Ory, "The Impact of Telecommuting on Commute Time, Distance and Speed of State of California Workers," UC Davis Institute of Transportation Studies, 2005.
- ^{iv} See Walls, et al "What Drives Telecommuting? Relative Impacts of Worker Demographics, Employer Characteristics and Job Types," *Transportation Research Record No. 2010*, 2007.
- ^v National Household Travel Survey (2009) Data Tables, <http://nhts.ornl.gov/tables09/ae/TableDesigner.aspx>.
- ^{vi} US Dept of Transportation, "Working At Home—The Quiet Revolution," National Household Travel Survey, July 2008.
- ^{vii} Calculation assumes \$3.07/gal for gas (Energy Information Administration, Jan 2011); 20.6 miles/gallon corporate average fuel economy (EIA 2010) and other operating costs of \$0.0547/mile (AAA, 2010).
- ^{viii} US Office of Personnel Management, *Telework Works: A Compendium of Success Stories*, Washington DC, 2001. Shafizadeh, et al, "The Costs and Benefits of Telecommuting: A Review and Evaluation of Micro-Scale Studies and Promotional Literature," *California Partners for Advanced Transit and Highways (PATH) Technical Memo*, Institute of Transportation Studies, UC Berkeley, Aug. 2000.
- ^{ix} See Commuter Challenge Case studies: <http://www.commuterchallenge.org/cc/csintro2.html>
- ^x Janet Caldwell, "Working Outside the Box: A Study of the Growing Momentum in Telework, IBM, Jan 2009.
- ^{xi} US Government Accountability Office, "Continuity of Operations: Certain Agencies Could Improve Planning for Use of Alternative Facilities and Telework During Disruptions," May 2006.
- ^{xii} See, for example, Urban Mobility Report Summary Table 1:
http://mobility.tamu.edu/ums/congestion_data/tables/national/table_1.pdf
- ^{xiii} Ibid.
- ^{xiv} Pratt, Ibid
- ^{xv} General Accounting Office, *Telecommuting: Overview of Obstacles Facing Employers*, Washington DC, 2001. (<http://www.gao.gov/new.items/d01926.pdf>)
- ^{xvi} Telecommuter Tax Fairness Act in the 108th, 109th, 110th, and 111th Congresses.
- ^{xvii} Federal Communications Commission, *National Broadband Plan*, Chapter 13, Section 13.3, 2009.
- ^{xviii} 29 CFR § 1904.46 (2010); US Dept of Labor, Statement Of Charles N. Jeffress, Assistant Secretary For Occupational Safety And Health U.S. Department Of Labor Before The Subcommittee On Employment, Safety, And Training Senate Committee On Health, Education, Labor And Pensions, Jan 25, 2000.
- ^{xix} See GAO, *Telecommuting*, Ibid.
- ^{xx} For a detailed treatment of the Federal government's potential role in telecommuting, see Kenneth P Green, "Should the Government Expand Telework?," *Energy and Environment Outlook No. 2*, American Enterprise Institute for Public Policy Research, August, 2010.
- ^{xxi} P.L. 111-292, for details see <http://www.govtrack.us/congress/bill.xpd?bill=h111-1722>
- ^{xxii} Choo & Mokhtarian, Ibid.
- ^{xxiii} Cambridge Systematics, *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions (Appendices)*, Urban Land Institute, 2009.