Now That Travel Can Be Virtual, Will Congestion Virtually Disappear?

by Patricia L. Mokhtarian

MARK LEWIS Tony Stone Worldwide

The idea that telecommunications technology could substitute for travel dawned on people soon after the invention of the telephone. In the late 1870s letters and articles speculating on the potential of the telephone to replace face-to-face meetings appeared in various London newspapers. The science fiction of H. G. Wells ("When the Sleeper Wakes," 1899) and E. M. Forster ("The Machine Stops," 1909) described videoconferencing machines (or "kineto-tele-photographs," as Wells put it) that could accomplish the same goal. And an article in a *Scientific American* supplement from 1914 predicted that telecommunications would reduce transit congestion.

These ideas resurfaced in the 1960s and 1970s, as computing technology began to permeate society and the energy crises of the period prompted efforts to limit the burning of fossil fuels. But today, with fax machines and personal computers ubiquitous and videoconferencing almost mundane, congestion on the roads is worse than ever.

What's going on? Is the tidal wave of telecommuting still imminent, or are we anticipating something that is not likely to happen? When I started researching this question 15 years ago, I was optimistic about the power of telecommuting to reduce congestion, but now I'm more skeptical.

Commuting to work is the single most common trip people make and is a major contributor to overcrowding on the roads. Unlike trips to the grocery store or the doctor, the commute to the office can be more easily eliminated or reduced with telephones, faxes and e-mail. So if we hope to use communications technology to mitigate congestion, telecommuting is perhaps our best option. Conversely, if telecommuting does not do much good, then it is unlikely that teleshopping, teleconferencing, telemedicine, telebanking and other "telestuff" will have much impact.

Many people say they telecommute, but what really counts is how many are actually doing so on any given day. That number is the product of several factors, such as how many people can telecommute. Of those, how many want to? Of that group, how many actually do, and how often and for how long?

For many workers, telecommuting is simply not feasible. The job may be unsuited to it, or they lack the proper equipment. Some people are not aware they could telecommute; others face unwilling managers. I estimate that at present only about 16 percent of the entire workforce can actually consider telecommuting.

Not everyone who can telecommute even wants to, and not everyone who claims to want to actually does. Many people desire the professional and social interactions of the office. Others may be concerned about lack of self-discipline and domestic distractions. Many workers also consider the commute to and from their job a desirable buffer between home and office.

Although full-time telecommuting suits some, most people prefer doing it part-time—one or two days a week on average. In addition, several studies have noted that most people who try telecommuting do not do so forever: one half are likely to drop out within a year or so of starting. So what do all these statistics mean? Probably no more than 2 percent of the total workforce is telecommuting on any given day.

Now the question becomes whether these telecommuters actually have an effect on congestion. We do know that telecommuters drive less. This may seem obvious until you realize that there are several ways in which telecommuting could theoretically increase travel. People might decide to take more excursions to avoid cabin fever at home. Or telecommuters who once carpooled to work might decide to drive alone on the days when they do go into the office.

The challenge arises in trying to extrapolate such findings to determine the overall effect of telecommuting on traffic on the roads. I estimate that telecommuting by 2 percent of the workforce translates to a reduction in the total number of miles driven in personal vehicles (cars and light-duty trucks) of 1 to 2 percent—an amount swamped by the increasing number of miles traveled by Americans in general.

Even this modest reduction will most likely decline over time. Today's telecommuters tend to live twice as far from work as the average employee. But when (or if) telecommuting moves into the mainstream, the distances saved on each occasion will fall closer to the average. Extra trips will probably increase as well. Early telecommuters may have been reluctant to take excursions from home because they were already traveling so far on the days they still had to commute. If telecommuters have a shorter drive to work, new trips for shopping or socializing on their telecommuting days may become more appealing.

The long-term effects of telecommuting, especially on where workers will choose to live, are not well understood at all. Telecommuting could potentially motivate some people to move even farther from work than they live now.

If telecommuting ever did reduce congestion noticeably, the excess capacity on the highways would almost certainly be quickly filled by changes in current travel patterns. For example, more people might decide to drive alone instead of using public transportation.

Historically, transportation and communications have been complements to each other, both increasing concurrently, rather than substitutes for each other. And we have no reason to expect that relationship to change. Yet under the right circumstances, telecommuting offers substantial benefits to employers, employees and society at large. Communications technology can increase productivity, reduce costs and give workers more personal flexibility. Sizable reductions in travel will not be among these benefits, but telecommuting is still an idea worth promoting. SA

PATRICIA L. MOKHTARIAN, professor of civil and environmental engineering at the University of California, Davis, has studied the effects of telecommunications on travel behavior, land use and the environment since 1982.