Putting in Perspective the Contribution of Transportation to the Environmental Effects of Telework

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ABSTRACT

Telework has been proposed as a possible remedy to traffic and air pollution problems. This paper presents a model of telework's direct air pollution implications by quantifying personal and public transportation, office and home electronic equipment use, lighting, heating and cooling effects. An example scenario created using this model and transportation data from the National Telework Survey finds that in assessing the environmental impacts of the various components of the model (except transportation), it is important to identify the parameters that are most likely to counteract the anticipated transportation benefits. The results differ based on local climate since the energy use associated with heating and cooling is different. As anticipated, transportation impacts represent a substantial part of the telecommuting model. However, the analysis reveals that the rest of the components of the model are also significant, and should not be excluded. While CO2 and NOx emissions associated with electronic equipment use appear to be comparable in the home and the company office, along with SO2 emissions, they are found to be higher for the company office than for the home office in the summer, largely on the account of cooling energy use. The current teleworking scenario does not eliminate the company office impacts while it incurs additional home office-related impacts. As expected, passenger vehicle (as the most common mode of transportation) and light rail emissions (as the lowest) combined with warm and cold week emissions reveal a difference in CO2 emissions in favor of light rail. However, accounting for home heating and cooling, telecommuting emissions during winter when the mode of transportation is light rail are comparable to the impacts observed in summer when driving a passenger vehicle. Latent demand combined with non-work induced travel may prevent savings normally expected from a telecommuting program. In that case, the only savings may come from the home and office portion of the model, if at all. The analysis performed in this paper shows that the success of a telecommuting program is a function of the scale of implementation and a comparable assessment of the individual components of the model.

(Paper published in the Proceedings of the 2002 Transportation Research Board Annual Meeting, Washington, DC, January 2002)