

The Road Less Driven

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Americans gain tremendous benefits from their driving in the form of access to opportunities. But the benefits do not come without burdens, for individuals and for society. To manage those burdens, transportation planners should focus on strategies that selectively reduce driving in two ways: by making it possible to drive less through land use policies and investments in non-auto infrastructure, and by discouraging less important driving with pricing policies. But merely layering a “drive less” approach on top of traditional efforts to make driving easier doesn’t make sense. A more effective blend of strategies is needed.

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In September 2005, Hurricane Katrina slammed into New Orleans, causing unprecedented damage and destruction to the city and surrounding areas. A few weeks later, Hurricane Rita narrowly missed Houston but caused significant damage to oil rigs in the Gulf and shut down oil refineries on land. As a result, gas prices rose to over \$3 per gallon around the United States (U.S. Department of Energy [DOE], 2005a), a level unseen in inflation-adjusted terms even at the peak of the late 1970s energy crisis (DOE, 2005b). Shortages in the gasoline supply occurred temporarily in many parts of the country, and the threat of more sustained shortages loomed. When in the following days President Bush urged Americans to drive less to avert a crisis, the response of a New Jersey resident reflected the feelings of millions: “It’s an idealist idea. Are people going to adhere to it? No. . . . You have to do what you have to do” (as quoted in Barmann, 2005). What most Americans have to do is drive.

These events also made the larger implications of our widespread dependence on driving difficult to ignore. The record number of named storms in the Atlantic in 2005, including Hurricanes Katrina and Rita, raised the chilling possibility that extreme weather events are becoming more common, in part because burning fossil fuels contributes to global warming. The inability of low-income residents of New Orleans to evacuate the city before Katrina provided a painful reminder that those who have no access to a car do not have the same opportunities as those who do, with potentially life-threatening results. The immovable traffic jams that residents of Houston faced in attempting to evacuate that city before Rita pointed to the limits of a transportation system dominated by private vehicles. These were extreme events, but they all magnified the daily burden of auto dependence on the environment, social equity, economic efficiency, human health, and ultimately quality of life.

To manage the growing burden driving imposes on individuals and on society, transportation planners should focus on strategies that reduce driving, not across-the-board, but selectively, so as to reduce societal burdens while preserving as much individual benefit as possible. Transportation planners can enable less driving through land use policies and investments in non-auto infrastructure, and can encourage less driving through pricing policies. The immediate payoff from this approach may be limited, but the potential long-run benefits are substantial.

The Benefits and Burdens of Driving

Cars give Americans unparalleled freedom to go where they want, when they want, quickly and directly. Cars make it easier to get places, and they give Americans more choices of where to live, work, and play. It's no surprise, then, that Americans drive a lot. In 2003, the average American household drove nearly 25,000 miles per year and put over 11,000 miles per year on each of their cars (Hu & Reuscher, 2004). Americans gain tremendous benefits from their driving in the form of access to opportunities. But the benefits do not come without burdens.

American households spent an average \$7,825 (in 2000 dollars) to own and drive a car in 2002 (Bureau of Transportation Statistics [BTS], 2004). They spend an average of 55 minutes per day in their cars (BTS, 2003), contributing to how pressed for time they feel (Robinson & Godbey, 1996). Time spent in the car for commuting when congestion levels are high is particularly burdensome, affecting blood pressure and even mood (Novaco, Stokols, Campbell, & Stokols, 1979). Exposure to traffic-related air pollutants such as carbon monoxide and particulate matter are especially high for drivers and their passengers on freeways, where these pollutants are found in high concentrations (Chan, Ozkaynak, Spengler, & Sheldon, 1991; Riediker, Williams, Devlin, Griggs, & Bromberg, 2003; van Wijnen, Verhoeff, Jans, & van Bruggen, 1995). In 2002, there were more than 42,000 fatalities in the United States related to highways, and nearly 3 million people suffered injuries from highway crashes (BTS, 2004). Driving has also been tied to obesity: A study in Atlanta showed that each additional hour of driving per day was associated with a 6% increase in the probability of being obese (Frank, Andresen, & Schmid, 2004).

By driving so much, each of us also imposes burdens on others. In 1999, oil consumption in the United States reached 19.5 million barrels per day, 26.5% of the world's consumption, 68% of it for transportation (Davis, 2001). The transportation sector dumped 513 million metric tons of carbon dioxide, a major greenhouse gas, into the atmosphere in 2000, more than any other nation (BTS, 2002). Thirty-six metropolitan areas that are home to a total of 85 million people still fail to meet the national standards for ozone, contributing to a variety of respiratory problems (U.S. Environmental Protection Agency [EPA], 2002, 2005). Studies show that fine particulate matter, generated by diesel engines and other sources, is associated with higher levels of mortality (e.g., Pope et al., 2002); premature deaths linked to particulate matter are now comparable to deaths from traffic accidents (California Air Resources Board, 2004). Ozone and particulate matter have both

been linked to problems with lung development and levels of asthma in children (English et al., 1999; Lin, Munsie, Hwang, Fitzgerald, & Cayo, 2002; McConnell et al., 2002). Though quantifying these costs is an inherently uncertain and assumption-laden activity, a comprehensive study put the total social cost for driving in the United States in 1990–1991 at \$1.67 to \$3.31 trillion per year (Delucchi, 1997).

Other societal burdens are more subtle. The label “transportation disadvantaged” has been applied to those who for reasons of income, age, or disability cannot drive a car (e.g., U.S. General Accounting Office, 2003). Special transit services aim to address the needs of those whose physical or mental abilities limit their ability to drive, with only limited success. Households that cannot afford a car depend on taxis, fixed-route public transit, walking, biking, and getting rides with others, reducing their access to jobs, education, and services compared to those with cars. Overall, low-income households make fewer and shorter trips than their higher-income counterparts, suggesting a constrained ability to travel (Pucher & Renne, 2003).

For nearly a century, public funding for transportation has predominantly gone towards making driving easier. Total capital outlays for roads in the United States by all levels of government ranged between \$30 billion and \$50 billion per year (in constant 2000 dollars) for decades and have approached \$60 billion per year in recent years (U.S. Department of Transportation [DOT], 2000). Yet increases in road capacity have not kept up with the growth in vehicle travel: Between 1941 and 2000 total miles of roads in the United States increased by 16% per person while vehicle-miles-traveled increased by 290% per person (BTS, 2003). As demand has grown faster than capacity, congestion has increased: Annual hours of delay per person grew by 188% between 1982 and 2001, to an average of 46 hours per year (Shrank and Lomax, 2004). Although driving still works better than the alternatives in most situations, most Americans would agree that the automobile system is not working as well as it used to.

All of this points to a daunting challenge for transportation planners: How can we preserve the benefits of driving and yet manage the many burdens that come with it, for individuals as well as for society?

Managing the Burdens while Preserving the Benefits

Managing the societal burdens of driving is challenging. Mathematically, there are two ways to reduce the burden: Reduce the burden per mile, or reduce the number of

miles. The former is appealing, particularly if it does not require a change in behavior. For example, technological strategies, such as improvements in vehicles or the adoption of alternative fuels, can help to reduce the per-mile impact on the environment. Indeed, technological innovation directly explains improvements in air quality in recent decades despite increases in driving (Federal Highway Administration, 2005). Improvements in vehicle technology have also helped to reduce the rate of traffic fatalities; air bags alone save over 2,500 lives per year (National Highway Traffic Safety Administration, 2006). But not all of the burdens of driving, particularly those related to equity, can be solved through technology.

To manage the growing burden, then, we must also consider reducing miles of driving. But can driving be reduced without also reducing benefits? Is it even possible to get people to reduce their driving? I believe that the answer is “yes” to both of these questions.

Which Driving to Reduce

Given how Americans have arranged their lives and their cities, the car has become the only practical way to make daily life work for most people. In our 2003 survey of residents of eight suburban neighborhoods in Northern California, 86.5% of respondents agreed or strongly agreed that “I need a car to do many of the things I like to do” and 76.3% disagreed or strongly disagreed that “We could manage pretty well with one fewer car than we have” (Handy, Mokhtarian, Buehler, & Cao, 2004). But as dependent on their cars as Americans feel they are, other evidence suggests they can reduce their driving.

The most obvious driving to reduce is the driving that individuals would choose not to do if that were possible. In a recent study of ours, nearly 80% of participants said that they drive more than they want to, and most pointed to congested commutes as the driving they would most want to do without (Handy, Weston, & Mokhtarian, 2005). Granted, many people value commute time that allows an opportunity for adjustment between work and home; one study shows that a commute on the order of 15 minutes is preferred over no commute at all (Redmond & Mokhtarian, 2001). But the average commute time in the United States is hovering around 25 minutes. Most Americans aren’t choosing a longer commute because they want to spend more time in the car; rather, the longer commute may be necessary to secure a preferred job. The same argument works for other necessary activities like grocery shopping and medical appointments. These are high-benefit trips, but also high burden trips, for individuals and for society.

Less obvious is the driving that individuals choose to do but could probably do without, driving that they would

forego if the direct cost to them were a bit greater. In our study, almost half of participants admitted that they drive more than they need to (Handy, Weston, & Mokhtarian, 2005). They make more frequent trips and use longer routes than necessary for reasons ranging from enjoyment of driving to poor planning. Were the cost of driving even slightly higher, individuals would have an incentive to avoid repeated trips to the grocery store and might choose other forms of recreation over driving. Evidence that households can reduce driving somewhat without great sacrifice comes from a pilot study of the Travel Blending program in Adelaide, Australia: One-on-one sessions to identify ways households could reduce driving led to a 10% reduction in driving on average (Rose & Ampt, 2001).

How to Reduce It

Travel behavior theory suggests that individuals choose the alternative that provides them with the greatest “utility.” Most people choose driving on most occasions because it offers the shortest travel time and the greatest convenience and comfort. For alternatives such as transit, walking, and biking to compete, they must offer greater utility than driving for a given trip. Transportation planners can take steps to tip the balance away from driving by doing two things: make it possible to drive less, and make it more expensive to drive. Both are essential to achieve a selective reduction in driving.

Making it Possible to Drive Less. The first step is to make it possible to drive less so that individuals can choose to reduce their most burdensome driving. Making it possible to drive less by reducing trip distances and frequencies depends on land use policies that bring destinations in closer proximity to home and to each other. Examples being implemented throughout the United States include new urbanist or traditional design ordinances, redevelopment programs for brownfield and grayfield sites, incentives for infill development, programs to revitalize traditional neighborhood commercial areas, requirements to incorporate services into office parks, regional growth containment strategies, affordable housing programs, live-near-your-work programs, and others. Such strategies allow residents to find jobs and needed services within shorter distances and to meet multiple needs with single trips to mixed-use destinations, whether they drive or use other modes. Evidence suggests that there is at least some unmet demand for places where driving is less necessary (e.g., Levine, Inam, Werbel, & Torng, 2002; Myers & Gearin, 2001).

Making it possible to drive less by using other modes also involves land use strategies, as well as investments in non-driving modes. Transit-oriented development (TOD), for example, promotes the coordination of land development

efforts with transit investments and increases opportunities for living, working, and shopping within walking distance of transit. Information technologies such as real-time schedule information and in-vehicle surveillance systems are helping to improve the quality of transit service, as are changes in the design of buses and bus stops. Investments in bicycle and pedestrian infrastructure and traffic control practices that include more consideration of the needs of bicyclists and pedestrians make nonmotorized modes more competitive. These approaches and others have the potential to increase the utility of nondriving modes if applied in appropriate ways in appropriate places.

The transition from driving-oriented communities to communities where driving less is possible will not be instantaneous. In the short run, strategies to improve the potential for walking and biking may prove most effective. Small changes in land use and incremental improvements to infrastructure can make significant differences for these modes, which function at a local scale. Transit is a longer term proposition in automobile-oriented areas, in that land use patterns must change at a regional scale and transit must achieve critical mass to realize its full potential. Many cities in the United States are looking to bus rapid transit as a starting point for supporting higher density development that might eventually justify rail investments. There is no single model for a transit metropolis, but compatibility between land use patterns and the structure of the transit system is essential (Cervero, 1998).

Making Driving More Expensive. The second step is to make driving less attractive by making it more expensive, to discourage trips for which the benefits do not outweigh the burdens they impose. Pricing can help shift the societal costs of driving back onto the individuals who drive. Transportation planners in the United States have considered road pricing as a demand management strategy for many years, but have had little success in implementing it. Other ways to discourage driving may be more politically viable. One example is to make people pay more directly for driving without paying more in total. The more directly drivers pay, the more likely they are to consider these costs when making travel choices; costs paid indirectly or occasionally are easy to ignore. Toll roads are one way of doing this; another possibility is pay-as-you-drive insurance. Simply letting congestion grow also makes driving more expensive. This approach requires less initiative from public agencies, but does little to relieve burdens and may create new ones.

Policies that increase the cost of driving reduce societal burdens at the expense of increased burdens on individuals. Yet in the long run lower societal burdens will benefit individuals as well. In particular, getting less important

driving off the road will help to improve speeds for more important driving. In addition, if other policies make it possible to drive less, then increases in the price of driving will be less of a burden, since individuals could choose to drive less instead of paying more without great sacrifice. Still, the impact on low-income households of increasing the price of driving must be considered.

Conclusions

Selectively reducing driving can reduce societal burdens while preserving benefits for individuals. Planners can help to bring this about by simultaneously enabling and encouraging less driving.

But merely layering a “drive less” strategy on top of the traditional “easier driving” approach doesn’t make much sense. The two are inherently contradictory, and a combined approach is inefficient. SAFETEA-LU, the federal transportation bill signed in 2005, authorized \$37 to \$42 billion per year for highway projects but less than \$10 billion for transit; included in the bill were a new Safe Routes to School program at \$122 million per year and a Nonmotorized Pilot Program at \$100 million per year (Congressional Research Service, 2005). Even this level of funding for highways is not enough to have an appreciable effect on congestion for long, yet funding is also insufficient to provide competitive alternatives in many places.

Transportation planners have supported elements of the drive-less approach for some time, and interest in this approach appears to be growing among decision makers as well as their constituents. Few seem to recognize, however, that simultaneously aiming to make driving easier makes little sense. Unless we soon adopt a more effective blend of strategies, we may find ourselves with more burdens and fewer benefits from driving.

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