

to “confront practical choices between providing for bodily presence and relying on tele-presence” in the design of actual space and virtual places.

Mitchell concludes with the warning that there are great uncertainties and dangers in the bitsphere frontier. He reassures us that “it is a place for new opportunity and hope” in which “[f]rom the gesture sensors worn on our bodies to the worldwide infrastructure of communications satellites...the elements of the bitsphere will finally come together to form one densely interwoven system within which the knee bone is connected to the I-bahn.” This Disneyesque projection of the future is privileged over William Gibson’s fleetingly referenced dystopian vision of cyberspace. However, it does so without resolving or adequately grappling with the questions of whose knee bones will be plugged in, whether it will be with their knowledge and permission, and who will control access to the network and have the capacity to block or censor transmissions. As if the equitable solution of these questions is not a big enough concern, Gibson’s writings also alert us to the possibility that conflicts over control in the city of bits may be between human constructs (corporations) and artificial intelligence constructs rather than the usual suspects in terrestrial power struggles.

Car Trouble, by Steve Nadis and James J. MacKenzie. Boston: World Resources Institute, 1993.

Stuck in Traffic: Coping with Peak-Hour Traffic Congestion, by Anthony Downs. Washington, D.C.: Brookings Institution, 1992.

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There are too many cars on the streets of modern urban America. This is one point about which the authors of *Car Trouble* and *Stuck in Traffic* agree. Beyond this, there are few perspectives or conclusions the two works share. The authors of *Car Trouble* count environmental degradation as the most unfortunate result of excess automobility. In *Stuck in Traffic*, the economic inefficiency of traffic congestion is the primary negative consequence.

Car Trouble is coauthored by Steve Nadis, a contributing writer and editor of periodicals such as *Technology Review* and *Omni*, and James MacKenzie, a physicist and senior associate with WRI’s program in climate, energy, and pollution. Although replete with citations, *Car Trouble* is not an academic work. Most of the citations reference articles from newspapers and popular magazines, a narrow selection of environmental research, and a few established scholars in urban or transport issues. The book is definitely intriguing: No less than Ray Magliozzi, cohost of National Public Radio’s “Car Talk”, is quoted as calling the work “suspenseful and at times outright terrifying.” There is no way for the casual reader to judge the accuracy of the book’s many tidbits of information, but the read is entertaining and, even if only half the facts are true, the story is indeed terrifying.

After a couple of pages of car facts (e.g., the number of pounds of carbon dioxide produced by burning one gallon of gasoline is 19; the ratio of bicycles to cars in China is 250

to 1; the ratio in the US is 0.7 to 1) the authors launch into one of their most informed chapters, "The Age of Invention", presumably to give an overview of the history of the rise and ascendancy of the automobile in the US.

The authors recount that "after surpassing horses as a principal means of conveyance, cars overtook rail transport during the 1920s", and they note that by the end of the 1920s, "cars accounted for four times as many passenger miles as did rail cars", (p. 4). Something is wrong here, either grammatically, substantively, or both. Cars did not "surpass" horses even if the authors mean horses as in horse-drawn railways. Electricity had replaced horses as a motive power long before the automobile appeared on the scene. As for cars accounting for four times as many passenger miles as rail cars, this also is misleading and incomplete: There is no distinction between urban and rural travel, between peak and off-peak travel, between rail and interurban rail travel, or between bus transit and rail transit. This paragraph about the rise of the automobile is only one example of the misinformation contained in just a few sentences at the very beginning of the book. This might be forgiven had not the authors then supplied additional misinformation in an effort to explain the spectacular rise of the automobile.

The rise of the automobile, according to Nadis and MacKenzie, was due not only to changing consumer preferences (on this point, Anthony Downs in *Stuck in Traffic* is in complete agreement), but to "government policies, industry lobbying, and corporate greed" that "at times approached outright sabotage". They go on to present Bradford Snell's theory that General Motors conspired with other automobile interests to bring about the demise of mass transit, a theory rejected by most transport policy scholars (Adler, 1991). After establishing how and why the auto is king in Chapter 2, "Dead End", the authors catalog its many evil repercussions.

Even the most skeptical reader will feel at least a twinge of guilt when driving an automobile after reading this chapter of depressing car facts. The authors present evidence (albeit bordering on the anecdotal) that automobile use results in a myriad of horrible and undesirable effects. Millions of gallons of oil are spilled into US waters each year. Storm water runoff from roads causes oil, gas, and chemicals to infiltrate streams and rivers. The majority of the world's crude oil reserves lie in the "politically unstable Persian Gulf" (p. 19). Auto emissions pollute the atmosphere and have carcinogenic and toxic effects for humans. Global warming and ozone depletion are caused by carbon dioxide and chlorofluorocarbon releases from automobiles. Idling in traffic congestion wastes billions of hours of time (here, again, Downs, in *Stuck in Traffic*, is in complete agreement).

By Chapter 3, the reader is convinced that excess automobile use had questionable, if not outright horrific, consequences and that something should be done. The authors take the position that in order to stop what they see as a ticking time bomb, two things need to occur: (1) people need to drive less and (2) they need to drive fuel-efficient nonpolluting vehicles. The anxious reader may rest assured that the goal of getting people to drive less will be sufficiently addressed in Downs's *Stuck in Traffic*. The authors of *Car Trouble* are much more interested in exploring the issue of fuel-efficient nonpolluting vehicles.

Chapter 3, "The Drive for Better Cars", and Chapter 4, "Weighing the Alternatives", are the strongest chapters in the book, full of information comparing the technologies of various alternative fuels and motive powers for automobiles. The authors conclude that of all the options presently conceivable, only two kinds of automotive power offer the promise of

being truly emission free: electricity and hydrogen fuel. The authors caution, however, that both are only as clean as the energy sources used to create them (e.g., sun or wind) and that there still are many obstacles to overcome in making either type of vehicle affordable and attractive to the US consumer. It is clear that, although there are potential alternatives to the present gasoline fueled automobile, the obstacles are significant. The authors are convinced that the primary obstacles to the use of nonpolluting vehicles (cost and performance) can be overcome, but their reasoning about how this might be accomplished is flawed. On the subject of cost, the authors assume that economies of scale will result from mass production of the alternative vehicles. In and of itself, this may be true, but unless there is sufficient consumer demand for these vehicles, mass production will result only in excess supply.

The authors acknowledge, but do not address the political and economic complexities involved in the notion that significant government and subsidy and information dissemination may be required to support the production of alternative vehicles. They also fail in this respect when they present other strategies for combating auto pollution or overuse. For example, they inadequately address the issues of equity and regressivity of some of the proposals such as an increase in the gasoline tax. The authors present all of the potential solutions devoid of implementation context, thus leaving the unrealistic impression that use of alternative vehicles would be simple to accomplish if only the government and auto manufacturers would stop conspiring to prevent it.

In the introduction to *Stuck in Traffic*, Anthony Downs, senior fellow in the economic studies program at the Brookings Institute in Washington, D.C., succinctly presents the focus of his book: Between 1975 and 1987, the amount of rush-hour traffic that the federal Department of Transportation classifies as congested rose from 42% to 63%.

This increase in congestion is of concern for two reasons. On an individual level, congestion is unpleasant and frustrating. On a societal level, "congestion is undesirable because it misallocates scarce resources and causes economic inefficiency", (p. 2). Congestion also causes sprawl as businesses and employees decentralize in an effort to avoid long commutes and traffic tie-ups. Downs and other economists refer to the various problems resulting from congestion as distortions which result from the fact that individual drivers do not pay the true social costs for their travel decisions.

It is from this premise that Downs proceeds, that is, from an economist's assumptions regarding efficiency, optimization, and utility. For example, in describing the advantages and disadvantages of market and nonmarket-based approaches to attacking congestion, Downs admits that "as an economist, I favor the market-based approach" (p. 25). He explains that market-based tactics "assign monetary value to different types of travel behavior and then rely on travelers to choose among them. The goal is to achieve more efficient use of scarce resources, usually by making the price of different travel options equal or nearly equal to their social costs so that marginal benefits will equal or exceed marginal costs" (p. 24). In case the noneconomist does not quite grasp the nuances of the argument, Downs explains in plain English why the market-based approach is better than the regulatory: It gives more choice to individuals, it is more flexible, and it can raise money with which to improve regional transportation facilities. Not all of his arguments will be immediately apparent to the noneconomist, who may not agree that all drivers have the "same set

of choices” or that maximizing individual choice is always in the best interest of society as a whole.

After setting the stage for the economist’s approach to tackling congestion, Downs presents a discussion of four principles of traffic analysis which serves as a very good overview of some of the most important issues facing transportation planners. The chief of these, and the one Downs presents in the greatest detail, is the principle of triple convergence. Briefly, the rule of triple convergence states that most drivers will seek the quickest best route. If there is any kind of road improvement, three things can happen: (1) Drivers who formerly used alternative routes will switch to the route that has been improved, (2) drivers who formerly traveled at times other than rush hour will switch to traveling during peak period, and (3) those who used to take public transport will switch to driving. It is this kind of overview of some of the basic principles of transportation policy and planning that make Downs’ book particularly useful for the reader interested in transportation and transport economics, but not necessarily an expert or specialist in those areas.

In Parts 2, 3, and 4, Downs discusses three categories of solutions to congestion. The first, “supply-side remedies” includes strategies such as improving transit service, rapidly removing accidents, or adding carpool and bus lanes. The second category, “demand-side remedies that do not change housing or job location” consists of four subcategories: “Regulatory” approaches, which “focus on behavior” include programs that would encourage ride sharing, stagger work hours, or allow for telecommuting. “Informational” approaches that might affect behavior include the use of intelligent vehicle highway systems that would keep drivers informed of changes in traffic conditions. “Market-based” approaches include charging higher prices for gas and parking. “Peak-hour road pricing” (that is, charging a road toll during rush hour) is also a market-based approach, but is treated in its own separate chapter.

Finally, Part 4 focuses on the third category of strategies for attacking congestion: demand-side remedies that change housing or location. The four chapters that make up Part 4 are especially instructive for those who have not thought about the relationship between transportation problems and land use issues. The connection between transportation and land use has emerged as one of the most significant themes in transportation planning in the past decade and Downs does a good job of presenting a balanced discussion. In fact, Downs devotes more space to land use solutions to congestion than to market-based solutions.

Downs discusses a number of land use options. Strategies that might increase residential densities may ultimately reduce travel and increase the feasibility of using public transit for work commutes. Initiatives that might decrease the distance between jobs and housing (for example, by encouraging new housing in areas where there is a job surplus) also would reduce travel. Concentrating jobs in large clusters would facilitate carpooling and employer-sponsored programs such as vanpooling.

The best contribution of this book appears in the last chapter. Here Downs presents a table in which congestion-attacking policies are listed in descending order of effectiveness, divided into the two categories of supply and demand-side. Each policy is rated qualitatively and, for the most part, unempirically. Despite their qualitative and empirical nature, the ratings are extremely useful and the table is an important contribution to transportation policy analysis.

In table and text, Downs attempts to struggle with two important aspects of policymaking: implementation (institution required and ease of implementation) and political acceptability. He concludes that there are very few tactics that could have significant impact on congestion if applied in isolation, that demand-side strategies (such as rush-hour road tolls) probably would be the most effective in terms of congestion reduction (also the least politically acceptable), but would also be the most costly, and that because congestion is a regional problem, a regional approach is necessary.

Stuck in Traffic and *Car Trouble* remind readers that, although change will be difficult, it is not impossible and we should not give up our quest for an uncongested, unpolluted urban environment. Both hint at the notion that the public must feel that a crisis exists before people are willing to embrace measures as drastic as overnight recharging of batteries or paying an additional \$0.05 or \$0.10 per mile to drive.

It is Downs, however, who concludes on the most depressing note. "My advice to American drivers stuck in peak-hour traffic", he says in the book's last sentences, "is not merely to get politically involved, but also to learn to enjoy congestion. Get a comfortable, air-conditioned car with a stereo radio, a tape player, a telephone, perhaps a fax machine, and commute with someone who is really attractive. Then regard the moments spent in traffic simply as an addition to leisure time" (p. 164).

This statement, whether meant tongue-in-cheek or not, is irresponsible and misleading. Many of us cannot afford all of the vehicle options Downs mentions that might make a congested commute more comfortable. As Nadis and MacKenzie have suggested, these extras only increase automobile emissions. The notion of commuting with someone who is "really attractive" is offensive for reasons that Downs just doesn't get or he wouldn't have said it. Finally, not everyone can give lost time more utility by mentally substituting the sense of leisure for the sense of lost. Despite this unfortunate ending, *Stuck in Traffic* is a must-read for students of urban studies and transportation planning and policy. It is already becoming a classic because of its concise overview of many important and timely issues and its dual emphasis on pricing and land use planning as weapons to attack the congestion problem.

REFERENCE

- Adler, S. (1991). The transformation of the Pacific electric transportation in Los Angeles. *Urban Affairs Quarterly*, 27, 51-86.

Real Places, by Grady Clay. Chicago: University of Chicago Press, 1994.

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In *Real Places*, Grady Clay offers his cross-section method for investigating our nation's manmade environment, an approach that requires one to move through a landscape, "in one side and out the other" (p. xxii). Warning that working only from maps or from documents is not enough, Clay admonishes readers to employ "maps, documents, histories, inter-