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Driving Change: Public Policies, Individual Choices, and Environmental Damage

by Trip Pollard

Editors' Summary: Transportation and land development patterns are a primary cause of many pressing environmental problems, including air and water pollution, loss of wildlife habitat and wetlands, and global climate change. These patterns result in large part from individual decisions such as whether to drive, what to drive, how much to drive, and where to live. Yet changing environmentally harmful individual behavior is particularly difficult when the government subsidizes such behavior and when public policies present barriers to less environmentally damaging alternatives. In this Article, Trip Pollard argues that halting subsidies for destructive behavior, removing barriers to less destructive alternatives, and providing more sustainable alternatives would provide individuals with a broader range of less environmentally damaging transportation and housing choices.

I. Introduction

There is strong public support for environmental protection, and widespread concern about air and water pollution, loss of open space, and other environmental problems.¹ Yet people frequently discount the environmental impacts of their behavior, and efforts to address harmful individual activities often have had little success.²

Although the harm caused by each person may be relatively minor, the cumulative impact of individual behavior is a leading cause of some of the most serious and intractable environmental problems. For example, transportation and land development patterns are a primary cause of many pressing environmental problems, including air and water pollution, loss of wildlife habitat and wetlands, and global

climate change.³ These patterns result in large part from individual decisions such as whether to drive, what to drive, how much to drive, and where to live.

Despite the tremendous environmental impacts of individual behavior, public policies have largely focused on reducing the adverse impacts of governmental and corporate activities. There are sound reasons for this focus, including the fact that such sources have been responsible for the largest and most visible share of pollution and other damage, these sources of harm are more readily identifiable, and there are a relatively manageable number of sources to monitor and address. Targeting governmental and corporate actors has achieved a number of significant successes in improving environmental quality.⁴

Policies and programs also have focused on reducing the adverse environmental impacts of consumer products, indi-

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1. In one recent poll, over three-fourths (77%) of Americans surveyed agreed that the country should do whatever it takes to protect the environment. PEW RESEARCH CENTER FOR THE PEOPLE AND THE PRESS, *BEYOND RED VS. BLUE*, May 10, 2005, available at <http://people-press.org/reports/display.php3?PageID=948> (last visited Sept. 12, 2005). In another poll, only 5% of respondents said they do not worry about water pollution or toxic waste contamination, and only 8% do not worry about air pollution. PollingReport.com, *The Gallup Poll, March 8-11, 2004*, at <http://www.pollingreport.com/enviro.htm> (last visited Sept. 12, 2005). See also Oliver A. Pollard III, *Smart Growth: The Promise, Politics, and Potential Pitfalls of Emerging Growth Management Strategies*, 19 VA. ENVTL. L.J. 247 (2000).
2. Michael P. Vandenbergh, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Law*, 57 VAND. L. REV. 515 (2004) [hereinafter Vandenbergh, *From Smokestack to SUV*].

3. Numerous reports and articles have explored these impacts. See, e.g., U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA), *OUR BUILT AND NATURAL ENVIRONMENTS: A TECHNICAL REVIEW OF THE INTERACTIONS BETWEEN LAND USE, TRANSPORTATION, AND ENVIRONMENTAL QUALITY* 11-17, 25-33 (2001) [hereinafter U.S. EPA, *TECHNICAL REVIEW*]. See also Pollard, *supra* note 1, for a summary of many of these impacts.

4. For example, EPA estimates that levels of the six principal air pollutants it regulates under the Clean Air Act dropped between 14% (ozone eight-hour standard) and 94% (lead) between 1983 and 2002. OFFICE OF AIR QUALITY PLANNING & STANDARDS, U.S. EPA, *NATIONAL AIR QUALITY AND EMISSIONS TRENDS REPORT: 2003 SPECIAL STUDIES EDITION 4* (2003) [hereinafter U.S. EPA, *TRENDS REPORT: 2003*]. Moreover, the benefits from EPA regulations have far exceeded the costs. OFFICE OF INFORMATION & REGULATORY AFFAIRS, OFFICE OF MANAGEMENT & BUDGET, *INFORMING REGULATORY DECISIONS: 2003 REPORT TO CONGRESS ON THE COSTS AND BENEFITS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES* (2003).

rectly addressing the harmful impacts of some individual activities. Once again, this approach has focused on a fairly small number of large corporations, and once again this approach has been very successful in some cases. For example, vehicle emission standards and fuel requirements imposed on automobile manufacturers and energy companies have significantly curtailed the amount of certain pollutants released per mile from driving.⁵

In contrast, the diffuse and widespread nature of most environmentally harmful individual activities has made it difficult to address such behavior. Command-and-control approaches have been particularly ineffective in many instances.⁶ Among other things, enforcement can be difficult and expensive when there are millions of actors, there may be little support for regulation when the impacts of each person's actions are relatively minimal and not readily apparent, and regulation can generate a political backlash if it is seen as an unwarranted intrusion upon personal liberty. Consequently, relatively few policies and programs have been designed to directly regulate environmentally harmful individual behavior.

Recently, there has been a renewed focus on the environmental impacts of individual behavior and increased efforts to understand why some policies and programs to address individual activities have been successful (such as campaigns to increase recycling)⁷ while many others have been largely unsuccessful (such as efforts to promote carpooling).⁸ There also has been increased discussion in legal scholarship of the influences on human behavior, as well as the potential to activate social and personal norms that can influence and alter harmful behavior as an alternative or supplement to regulatory approaches.⁹

The increased attention to individual behavior offers promising opportunities to reevaluate and expand approaches to many environmental problems. It must not, however, be used as an excuse to roll back existing protections or to reject additional measures to limit the substantial environmental damage still caused by governmental

and corporate activities.¹⁰ In addition, efforts to address environmentally harmful individual behavior must recognize the fact that many decisions and activities are based on limited information and a limited range of meaningful choices. For instance, a decision to drive to work may be the only practical choice if a person works in an office park with no housing nearby and no mass transit serving the site. Moreover, altering the behavior of large numbers of people who have little economic incentive to change is particularly difficult.¹¹ This difficulty is greatly exacerbated when government subsidizes the harmful behavior and public policies present barriers to less environmentally damaging alternatives. These limitations suggest some of the most promising targets for reducing the environmental harm caused by individual behavior—public policies that shape the availability and cost of possible choices.

This Article examines the potential to reduce environmentally harmful individual behavior by modifying the public investments, laws, and policies that influence many transportation and housing choices. It first provides an overview of some of the major trends and impacts of current transportation and land development patterns. The Article then highlights the role of public investments, laws, and policies in shaping these patterns. Finally, it examines some of the policy changes that could provide individuals with a broader range of less environmentally damaging transportation and housing choices by halting subsidies for destructive behavior, removing barriers to less destructive alternatives many people desire, and providing more sustainable alternatives.

II. Driving and Sprawl: Environmental Impacts of Individual Behavior

Current land development and transportation patterns exact a heavy toll on the environment and provide a striking illustration of the environmental impact of individual behavior. Although these patterns result from governmental and corporate behavior as well, the cumulative impact of countless decisions by millions of people—such as whether to drive or use some other transportation alternative like mass transit, what vehicle to drive, how frequently to drive, whether to carpool, and where to live—is staggering.¹²

5. U.S. EPA, *Mobile Source Emissions—Past, Present, and Future: Solutions That Reduce Pollution*, at http://www.epa.gov/otaq/inventory/overview/solutions/vech_engines.htm (last visited Sept. 12, 2005). This is an area where there is significant potential for additional improvement, such as further reducing vehicle emissions (including emissions such as carbon dioxide (CO₂) that federal regulations have not addressed), improving fuel efficiency, and requiring cleaner fuels.

6. See, e.g., Vandenbergh, *From Smokestack to SUV*, *supra* note 2; Craig N. Oren, *Getting Commuters Out of Their Cars: What Went Wrong?*, 17 STAN. ENVTL. L.J. 141 (1998); Daniel C. Esty & Marian R. Chertow, *Thinking Ecologically: An Introduction*, in THINKING ECOLOGICALLY: THE NEXT GENERATION OF ENVIRONMENTAL POLICY (Marian R. Chertow & Daniel C. Esty eds., 1997).

7. See Ann E. Carlson, *Recycling Norms*, 89 CAL. L. REV. 1231 (2001).

8. See Oren, *supra* note 6, focusing on requirements that major employers develop and implement trip reduction plans to reduce employee solo commuting through measures such as carpooling and transit.

9. See, e.g., Michael P. Vandenbergh, *Order Without Social Norms: How Personal Norm Activation Can Protect the Environment*, 99 NW. U. L. REV. 1101 (2005) [hereinafter Vandenbergh, *Order Without Social Norms*]; Vandenbergh, *From Smokestack to SUV*, *supra* note 2; Carlson, *supra* note 7; Richard McAdams, *The Origin, Development, and Regulation of Norms*, 96 MICH. L. REV. 338 (1997); Cass R. Sunstein, *Social Norms and Social Roles*, 96 COLUM. L. REV. 903 (1996); ROBERT C. ELLICKSON, *ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES* (1991).

10. For example, provisions to impose more stringent limitations on the release of mercury from power plants and to begin regulating CO₂ emissions are currently the focus of intense debate.

11. The difficulty of addressing a problem requiring behavioral changes by many people who lack an economic incentive to change is widely recognized. See, e.g., Carlson, *supra* note 7, at 1233-34 (discussing the difficulty of “large-number, small-payoff collective problems”); Vandenbergh, *Order Without Social Norms*, *supra* note 9, at 1105 (discussing “negative-payoff, loose-knit group situations”). However, recent increases in gasoline prices are providing economic incentives that are beginning to alter some driving behavior.

12. Of course, transportation and housing decisions also can bring tremendous benefits, including personal freedom and mobility, the ability to obtain and retain a particular job, flexibility of scheduling, psychological benefits, and social status. On the other hand, these patterns contribute to a range of personal and public costs in addition to the environmental costs that are the focus of this Article, including the health costs of pollution and of obesity due to decreased physical activity, increasing traffic congestion, costs to taxpayers to provide services to far-flung development, lack of access to jobs for low-income individuals, isolation of senior citizens and others unable to drive, increased energy costs, and the national security threat resulting from dependence on imported oil. Numerous books and articles have examined these impacts. See, e.g., F. KAID BENFIELD ET AL.,

A. Driving Trends and Impacts

Americans are highly mobile and for the most part completely dependent on motor vehicles. The number of miles we drive, the amount of trips we take, and the number of vehicles we own all have escalated rapidly in recent decades. Americans drove more than 2.89 trillion miles in 2003, an average of over 7.9 billion miles each day.¹³ This is equivalent to approximately 88 daily trips to the sun. The dramatic rise in driving has outpaced increases in population and the number of cars people own. Between 1970 and 2002, it is estimated that vehicle miles traveled increased by 155%, more than four times the rate of population growth during that period.¹⁴ The number of trips each person takes, the average length of trips, and the amount of single-occupancy vehicle use have all risen as well.¹⁵

Not surprisingly, increased gridlock has followed this surge in driving. Nationwide, it is estimated that there were 3.7 billion hours of travel delay due to congestion in 2003, up from only 0.7 billion hours of delay in 1982.¹⁶ This congestion is estimated to have caused 2.3 billion gallons of fuel to be burned, costing over \$63 billion in wasted time and fuel.¹⁷

In addition, the type of vehicle people purchase has shifted, with a dramatic rise in sales of sport utility vehicles (SUVs) and an overall increase in the weight and acceleration of new vehicles. SUVs, vans, and pickup trucks are projected to comprise approximately 50% of model-year 2005 light-duty vehicle (cars, SUVs, vans, and pickup trucks) sales, and the market share of SUVs is roughly 13 times what it was in 1975.¹⁸ The overall fuel economy of light-duty vehicles in model-year 2005 is projected to average 21 miles per gallon, the same as in 1994 and less than the average fuel economy of vehicles 20 years ago.¹⁹

Cumulatively, individual transportation decisions cause severe environmental damage. Among other things, motor vehicles are a major source of pollutants such as carbon monoxide and smog-causing nitrogen oxides and volatile organic compounds, as well as certain air toxins.²⁰ The rapid

increase in driving, coupled with increasing congestion and decreasing vehicle fuel efficiency, has offset many of the gains the Clean Air Act and technological improvements have made in reducing the amount of emissions per mile traveled.²¹ Motor vehicles are a significant source of gases linked to global climate change as well, releasing an average of over one pound of carbon dioxide (CO₂) for each mile they travel,²² and light-duty vehicles produce approximately 20% of all CO₂ emissions in the United States.²³ Driving is also a primary cause of unsustainable petroleum consumption. Americans are responsible for one-quarter of the world's petroleum consumption, and cars, SUVs, and other light-duty vehicles account for roughly 40% of total U.S. oil consumption.²⁴ An average of 382.4 million gallons of motor gasoline was consumed each day in 2004 in this country.²⁵ Moreover, driving and associated activities are major causes of water quality problems, loss of wildlife habitat, loss of open space, generation of solid waste, and other environmental problems.

B. Sprawl Trends and Impacts

Land development patterns have changed dramatically in the United States since World War II, largely moving away from relatively compact, pedestrian-friendly cities and towns that mix commercial and residential uses and offer a variety of neighborhoods. Instead, most new development has been dispersed and automobile-dependent, with large areas of low-density subdivisions, sprawling shopping centers, and office parks located in previously rural areas beyond existing cities and towns.²⁶

Sprawling suburban and exurban development patterns are rapidly transforming the country. More than 25 million acres were developed nationwide between 1982 and 1997, an average of over 4,500 acres each day, and the rate of land consumption has been accelerating.²⁷ The Atlanta, Georgia, metropolitan area epitomizes these trends; it expanded in length from 65 miles in 1990 to 110 miles by 1997, arguably the fastest rate of growth of any area in history.²⁸ The rate of land consumption has accelerated much more rapidly than population has grown. In the Charleston, South Carolina, area, for example, population increased by 41% between

ONCE THERE WERE GREENFIELDS: HOW URBAN SPRAWL IS UNDERMINING AMERICA'S ENVIRONMENT, ECONOMY, AND SOCIAL FABRIC (1999).

13. OFFICE OF HIGHWAY POLICY INFORMATION, FEDERAL HIGHWAY ADMINISTRATION, HIGHWAY STATISTICS 2003, tbl. VM-2 (2004), available at <http://www.fhwa.dot.gov/policy/ohim/hs03/pdf/vm2.pdf> (last visited Sept. 19, 2005).
14. U.S. EPA, TRENDS REPORT: 2003, *supra* note 4, at 1.
15. BENFIELD ET AL., *supra* note 12, at 31.
16. DAVID SCHRANK & TIM LOMAX, THE 2005 URBAN MOBILITY REPORT (2005), available at http://tti.tamu.edu/documents/mobility_report_2005_wappx.pdf (last visited Sept. 12, 2005).
17. *Id.*
18. OFFICE OF TRANSPORTATION & AIR QUALITY, U.S. EPA, LIGHT-DUTY AUTOMOTIVE TECHNOLOGY AND FUEL ECONOMY TRENDS: 1975 THROUGH 2005, at 44 (2005), available at <http://www.epa.gov/otaq/cert/mpg/fetrends/420r05001.pdf> (last visited Sept. 12, 2005) (also available from the ELR Policy & Guidance Collection, ELR Order No. AD04980) [hereinafter U.S. EPA, FUEL ECONOMY TRENDS].
19. *Id.* at 6 (average fuel economy reached a peak of 22.1 miles per gallon in 1987-1988).
20. Vandenbergh, *From Smokestack to SUV*, *supra* note 2, at 546-49 (estimating that driving by individuals contributed over 7.5 million tons of ozone precursors in 1998, the largest single source of these pollutants in the United States), and 567-73 (individual use of motor vehi-

cles responsible for 94.5% of total emissions of acetaldehyde, benzene, and formaldehyde).

21. OFFICE OF MOBILE SOURCES, U.S. EPA, AUTOMOBILES AND OZONE, FACT SHEET (1993), available at <http://www.epa.gov/otaq/consumer/04-ozone.pdf> (last visited Sept. 19, 2005).
22. TRANSPORTATION RESEARCH BOARD, COMMITTEE FOR A STUDY ON TRANSPORTATION AND A SUSTAINABLE ENVIRONMENT, TOWARD A SUSTAINABLE FUTURE: ADDRESSING THE LONG-TERM EFFECTS OF MOTOR VEHICLE TRANSPORTATION ON CLIMATE AND ECOLOGY 79 (1997).
23. U.S. EPA, FUEL ECONOMY TRENDS, *supra* note 18, at ii.
24. *Id.*
25. Energy Information Administration, *Petroleum Quick Stats*, at <http://www.eia.doe.gov/ncic/quickfacts/quickoil.html> (last visited Sept. 12, 2005).
26. See Robert W. Burchell & Naveed A. Shad, *The Evolution of the Sprawl Debate in the United States*, 5 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 137 (1999); KENNETH T. JACKSON, CRABGRASS FRONTIER: THE SUBURBANIZATION OF THE U.S. (1985).
27. NATURAL RESOURCES CONSERVATION SERVICE, U.S. DEPARTMENT OF AGRICULTURE, NATIONAL RESOURCES INVENTORY 1997 (2000).
28. Christopher B. Leinberger, *The Metropolis Observed*, URB. LAND, Oct. 1998, at 30.

1973 and 1994, while the urban area expanded by 255%.²⁹ Even some areas that have lost population have seen an increase in land development as people spread farther out.³⁰

The dramatic rise in sprawl—which is driven by commercial development, road building, and other factors as well as by individual decisions about where to live—has enormous environmental effects. In addition to the massive conversion of forest and farm land noted above, a recent U.S. Environmental Protection Agency (EPA) report concluded that “development can have profound effects on our water resources.”³¹ Most significantly, replacing millions of acres of forests, farms, and wetlands that would otherwise filter water with impervious surfaces such as roads, parking lots, and rooftops can increase the volume of polluted runoff and slow groundwater replenishment.³² This impacts water quality and quantity and can increase flooding. It has been estimated that a one-acre parking lot creates 16 times more runoff than a meadow the same size,³³ and that the Atlanta area alone loses between 57 and 133 billion gallons of groundwater each year due to runoff caused by sprawl.³⁴ Further, although the rate of wetland loss in the United States has slowed in recent decades, the share of loss caused by development has increased,³⁵ and development has become the leading cause of wetlands loss.³⁶ The continued spread of sprawl is a major contributor to a number of other significant environmental problems, including air pollution, loss of biological diversity, and habitat fragmentation and loss.³⁷ Moreover, as EPA has noted: “The effects of land development on the environment are particularly important because development patterns have long-term effects that are not easily reversible.”³⁸

III. Public Policies Shaping Individual Behavior

Numerous factors shape individual behavior. The transportation and land development trends outlined above are not

merely the result of personal preferences and market forces.³⁹ Among other things, these trends are also influenced by demographic changes, economic growth, increasing personal income, and changing employment patterns. Moreover, a host of federal, state, and local governmental laws, regulations, programs, and investments play a major role in shaping individual transportation and housing decisions.⁴⁰ These public policies have intentionally and unintentionally promoted excessive driving and sprawl by offering taxpayer subsidies for environmentally harmful behavior, presenting barriers to less damaging alternatives, and providing few practical, sustainable alternatives.

A. Public Policies Promoting Driving

The U.S. Supreme Court has noted that “[d]riving an automobile [is] a virtual necessity for most Americans.”⁴¹ Public policies have played a major role in creating this dependence on motor vehicles. For decades, federal, state, and local transportation policies and investments have focused almost exclusively on road building and motor vehicles, leading two conservative commentators to conclude that there has been a “massive and sustained governmental intervention on behalf of automobiles.”⁴² Although this approach has provided significant benefits—such as creating jobs, promoting economic growth, and increasing mobility—it has severely limited the choices available to individuals.

Transportation spending policies and decisions have played a particularly significant role in shaping individual choices. The Federal-Aid Highway Act of 1956 shifted transportation policy decisively in favor of road building and motor vehicles, launching an unprecedented effort to build a 41,000-mile interstate system.⁴³ The federal government paid 90% of highway construction costs, the states 10%, and localities did not pay anything. At the same time, other transportation modes received minimal funding. Governmental investments continue to be heavily weighted in favor of road building. Recent federal spending on roads has been roughly 5 times as large as transit spending and over 100 times the amount spent on pedestrian and bicycle projects; many states spend an even higher percentage of their transportation budgets on roads.⁴⁴ Federal and state funds in

29. Tony Bartelme, *Tri-County Growth Binge “Not a Good Pattern,”* CHARLESTON POST & COURIER, Sept. 11, 1997, at 1-B, 4-B.

30. See, e.g., BENFIELD ET AL., *supra* note 12, at 8.

31. U.S. EPA, PROTECTING WATER RESOURCES WITH SMART GROWTH 5 (2004) (available from the ELR Guidance & Policy Collection, ELR Order No. AD04981).

32. U.S. EPA, NATIONAL WATER QUALITY INVENTORY: 2000 REPORT TO CONGRESS (2000), available at www.epa.gov/305b/2000report (last visited Sept. 12, 2005).

33. GEORGE MAURER, A BETTER WAY TO GROW: FOR MORE LIVABLE COMMUNITIES AND A HEALTHIER CHESAPEAKE BAY 4 (Chesapeake Bay Foundation 1996).

34. AMERICAN RIVERS ET AL., PAVING OUR WAY TO WATER SHORTAGES: HOW SPRAWL AGGRAVATES THE EFFECTS OF DROUGHT 2 (2002), available at <http://www.americanrivers.org/site/DocServer/sprawlreportfinal1.pdf?docID=595> (last visited Sept. 12, 2005).

35. BENFIELD ET AL., *supra* note 12, at 70-71. Over 6,500 acres of wetlands were drained in North Carolina between June 1998 and February 1999, mostly for development. Brian Feagans, *Hunt Asked to Stop Wetlands Drain*, WILMINGTON MORNING STAR, Feb. 18, 1999, at 1B.

36. U.S. EPA, THREATS TO WETLANDS (2001), available at http://www.epa.gov/owow/wetlands/pdf/threats_pr.pdf (last visited Sept. 12, 2005).

37. See, e.g., REID EWING & JOHN KOSTYACK, ENDANGERED BY SPRAWL: HOW RUNAWAY DEVELOPMENT THREATENS AMERICA’S WILDLIFE (2005), available at <http://smartgrowthamerica.org/ebreport/EndangeredBySprawl.pdf> (last visited Sept. 12, 2005).

38. U.S. EPA, TECHNICAL REVIEW, *supra* note 3, at 12.

39. See, e.g., Todd Litman, *Transportation Market Reforms for Sustainability*, 1702 TRANSP. RES. REC. 11-20 (2000).

40. See Oliver A. Pollard III, *Smart Growth and Sustainable Transportation: Can We Get There From Here?*, 29 FORDHAM URB. L.J. 1529 (2002) [hereinafter Pollard, *Smart Growth*], and Trip Pollard, *Follow the Money: Transportation Investments for Smarter Growth*, 22 TEMP. ENVTL. L. & TECH. J. 155 (2004) [hereinafter Pollard, *Follow the Money*], for further discussion of the role of public policies in shaping transportation and land development trends. See also JACKSON, *supra* note 26; Michael Lewyn, *Campaign of Sabotage: Big Government’s War Against Public Transportation*, 26 COLUM. J. ENVTL. L. 259 (2001); Michael Lewyn, *Suburban Sprawl: Not Just an Environmental Issue*, 84 MARQ. L. REV. 301, 312, 350 (2000) [hereinafter Lewyn, *Suburban Sprawl*].

41. *Wooley v. Maynard*, 430 U.S. 705, 715 (1977).

42. PAUL WEYRICH & WILLIAM S. LIND, CONSERVATIVES AND MASS TRANSIT: IS IT TIME FOR A NEW LOOK? 11 (Free Congressional Foundation 1993).

43. 23 U.S.C. §§101-118 (2002); see VUKAN R. VUCHIC, TRANSPORTATION FOR LIVABLE CITIES 93-127 (1999); Lewyn, *supra* note 40.

44. SURFACE TRANSPORTATION POLICY PROJECT, TEN YEARS OF PROGRESS: BUILDING BETTER COMMUNITIES THROUGH TRANSPORTATION 7, 10 (2002), available at <http://www.transact.org/report.asp> (last visited Sept. 12, 2005). Transportation decisionmaking is fur-

Virginia, for example, typically pay almost the entire cost of highway building and maintenance but only 55% of transit capital and operating expenses; localities and passengers must fund the remainder of these expenses.⁴⁵ This clearly creates a bias in favor of road projects. The failure to adequately fund transportation options such as public transit, bicycling, and walking has limited the availability, desirability, and safety of these modes, frequently depriving people of meaningful transportation choices.

Government subsidies encouraging motor vehicle use have been estimated to total up to several hundred billion dollars a year.⁴⁶ This includes expenditures at the federal, state, and local level on road maintenance, traffic control, and law and parking enforcement, as well as tax subsidies to the oil industry and preferential tax treatment for parking benefits.⁴⁷ Some commentators have suggested that the growing military costs to protect the flow of oil should be recognized as a subsidy that is not included in the price of gasoline.⁴⁸ Nor are drivers required to bear the external costs of their activities, such as the environmental and health harm they cause or the costs of congestion. These subsidies and externalized costs mask the true cost of driving, sending flawed price signals that have encouraged automobile dependence. The U.S. Office of Technology Assessment concluded that if motor vehicle “subsidies were withdrawn, externalities ‘internalized’ and hidden costs brought out into the open and directly charged to motor vehicle users, the perceived costs of motor vehicle use would increase substantially (by 14 to 89 percent, depending on [what] factors are included) and people would drive less.”⁴⁹ Another analysis concluded that American drivers would have to pay between \$5.60 and \$15.14 per gallon of gasoline if the full costs were included in the retail price.⁵⁰

ther skewed by the fact that federal expenditures on transit projects are more tightly regulated than highway project funding (see EDWARD BIEMBORN & ROBERT PUENTES, *HIGHWAYS AND TRANSIT: LEVELING THE PLAYING FIELD IN FEDERAL TRANSPORTATION POLICY* (Brookings Institute 2003), available at http://www.brookings.edu/es/urban/publications/20031215_Beimborn.pdf (last visited Sept. 12, 2005); Lewyn, *Suburban Sprawl*, *supra* note 40, at 314-15), and by the fact that many states prohibit using gas tax revenues for anything other than road projects.

45. VIRGINIA TRANSIT ASS'N, *PUBLIC TRANSIT IN VIRGINIA* (2002).

46. See STEPHEN H. BURRENTO, *ROAD KILL: HOW SOLO DRIVING RUNS DOWN THE ECONOMY* 27-29 (Conservation Law Foundation 1994); JAMES J. MACKENZIE ET AL., *THE GOING RATE: WHAT IT REALLY COSTS TO DRIVE* 61 (World Resources Institute 1992). See generally U.S. OFFICE OF TECHNOLOGY ASSESSMENT, *SAVING ENERGY IN U.S. TRANSPORTATION* 109 (1994); PETER MILLER & JOHN MOFFETT, *THE PRICE OF MOBILITY: UNCOVERING THE HIDDEN COSTS OF TRANSPORTATION* (Natural Resources Defense Council, Inc. 1993); Mark E. Hanson, *Automobile Subsidies and Land Use*, 58 J. AM. PLAN. ASS'N 60 (1992). Some estimates also calculate externalities such as health and environmental impacts.

47. See, e.g., Roberta F. Mann, *On the Road Again: How Tax Policy Drives Transportation Choice*, 24 VA. TAX REV. 587 (2005) (concluding that “a plethora of indirect federal funding through the tax system limits transportation choices”).

48. See, e.g., INTERNATIONAL CENTER FOR TECHNOLOGY ASSESSMENT, *GASOLINE COST EXTERNALITIES: SECURITY AND PROTECTION SERVICES* (2005), available at <http://www.icta.org/doc/RPG%20security%20update.pdf> (last visited Sept. 12, 2005).

49. U.S. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 46, at 109.

50. INTERNATIONAL CENTER FOR TECHNOLOGY ASSESSMENT, *THE REAL PRICE OF GASOLINE* (1998), available at <http://209.200.74.155/doc/Real%20Price%20of%20Gasoline.pdf> (last visited Sept. 12, 2005).

Numerous governmental regulations also influence individual transportation decisions. Minimum parking standards, for instance, which require developers to provide large amounts of free parking, further hide the cost of driving. It has been estimated that parking is free to the driver for 99% of trips in the United States.⁵¹ This encourages people to drive more frequently and to drive longer distances, and reduces the attractiveness of other transportation options.⁵² Street design standards, which frequently mandate building unnecessarily wide, high-speed roads, further discourage use of alternative transportation modes by reducing the safety of pedestrians and bicyclists.⁵³ Land use, tax, and other policies promoting sprawl discussed in the next section also influence transportation decisions. As homes and businesses scatter, driving becomes the only practical choice for most people to get to work, to shop, or to engage in many other activities. Transit, bicycling, and walking often become unrealistic options as “sprawl creates near total dependence on the private car.”⁵⁴

In short, as one commentator concluded: “[I]n most of America (especially in suburbs and smaller cities) government has rigged transportation systems to make driving a necessity for anything resembling a normal life. . . .”⁵⁵

B. Public Policies Promoting Sprawl

The causes of sprawling development patterns are numerous and complex. However, as with transportation decisions, governmental investments, subsidies, regulations, and other policies strongly influence individual housing choices and shape the pace, scale, and location of development. Public policies have intentionally and unintentionally promoted sprawl as well as disinvestment in existing communities. As one author observed, it is a myth that “postwar suburbs blossomed because of the preference of consumers who made free choices in an open environment. . . . Because of public policies favoring the suburbs, only one possibility was economically feasible.”⁵⁶

Governmental transportation policies encouraging motor vehicle use are among the leading causes of sprawl. A survey of urban specialists concluded that “[m]ore than any other single measure, the 1956 act created the decentralized, automobile-dependent metropolis we know today.”⁵⁷

51. DONALD C. SHOUP, *THE HIGH COST OF FREE PARKING* 1 (2005).

52. See *id.*; Donald C. Shoup, *The Trouble With Minimum Parking Requirements*, 33 TRANSP. RES. PT. A 549 (1999); Richard W. Willson, *Suburban Parking Requirements: A Tacit Policy for Automobile Use and Sprawl*, 61 J. AM. PLAN. ASS'N 29, 30 (1995). Parking requirements can further discourage the use of alternative transportation by making stores and offices less accessible to anyone not in a motor vehicle, among other things, by encouraging greater distances between buildings to provide sufficient asphalt to meet the requirements.

53. CONSERVATION LAW FOUNDATION, *TAKE BACK YOUR STREETS: HOW TO PROTECT COMMUNITIES FROM ASPHALT AND TRAFFIC* 24-28 (1998).

54. Robert Cervero, *Growing Smart by Linking Transportation and Urban Development*, 19 VA. ENVTL. L.J. 357, 358 (2000).

55. Lewyn, *Suburban Sprawl*, *supra* note 40, at 350.

56. JACKSON, *supra* note 26, at 293. Similarly, Jane Jacobs noted almost 45 years ago that “[t]he immense new suburban sprawls of American cities have not come about by accident—and still less by the myth of free choice between cities and suburbs.” JANE JACOBS, *THE DEATH AND LIFE OF GREAT AMERICAN CITIES* 308 (1961).

57. U.S. EPA, *TECHNICAL REVIEW*, *supra* note 3, at 10 (quoting ROBERT FISHMAN, FANNIE MAE FOUNDATION, *THE AMERICAN ME-*

Planners of the Federal-Aid Highway Act of 1956 correctly predicted that the impact of the massive highway building program would be “to disperse our factories, our stores, our people; in short, to create a revolution in living habits.”⁵⁸ Highways opened—and continue to open—new areas to development, providing the access that makes it possible to live farther and farther out. As one court observed: “Highways create demand for travel and [suburban] expansion by their very existence.”⁵⁹ In addition, road projects have spurred sprawl by destroying or damaging many existing communities.

Funding policies and decisions for other types of infrastructure similarly promote sprawl. Like roads, some of these investments—such as sewer and water extensions—open new land in outlying areas to development, subsidizing scattered development.⁶⁰ Other investments make existing neighborhoods less attractive to homebuyers and renters, such as school facility policies that often fund new schools in outlying areas instead of renovating existing schools.⁶¹

In addition to public infrastructure funding, numerous other taxpayer-funded subsidies distort individual housing decisions and promote sprawl. Among other things, subsidies for driving mentioned in the preceding section reduce the cost of living in sprawling areas, economic development incentives have provided cash payments and tax breaks to lure new businesses to outlying areas, and mortgage and tax policies have subsidized and favored ownership of single-family suburban homes.⁶²

A number of regulatory policies have spurred sprawl as well. Road design standards that focus exclusively on increasing the flow and safety of motor vehicle traffic are a prime example. These standards can mandate construction of unnecessarily wide roads, steering people away from existing communities by increasing noise and pollution, reducing pedestrian safety and mobility, destroying the attractiveness of neighborhoods, and undermining a sense of community.⁶³ In addition, as one article concluded, in new areas of development typical street standards “virtually dictate a dispersed, disconnected community pattern.”⁶⁴

Zoning and subdivision ordinances and regulations have had an even more profound impact on land development patterns and individual housing choices.⁶⁵ These provisions

often prohibit traditional patterns of development by requiring the geographic separation of residential areas from other uses. This prevents homes from being located near offices or stores. Although intended to prevent incompatible land uses from adversely affecting one another, setting aside large areas of land for discrete uses can effectively mandate sprawl and force people to drive to conduct most activities. This impact is compounded by regulations such as minimum lot size, minimum setback, and minimum parking requirements that disperse development and preclude compact design. Housing choices also have been limited by restrictions on multifamily housing and apartments. The cumulative impact of the widespread adoption of these provisions has been to greatly reduce the housing alternatives available to most individuals, largely mandating sprawling, single-family, detached housing. In fact, the less land-intensive forms of development that typified American cities and towns prior to World War II—with a mixture of uses, often on small lots with no setbacks—are illegal to build today in many localities.⁶⁶

IV. New Directions: Reorienting Public Policies to Promote Smarter Growth and More Sustainable Transportation Choices

Enormous opportunities are available to reduce the environmental impacts of individual transportation and housing decisions by reorienting the host of public policies that currently promote extensive driving and sprawl.⁶⁷

A. Eliminate Subsidies Promoting Harmful Behavior

One of the most promising areas of reform is to reduce and ultimately eliminate the pervasive subsidies that promote environmentally damaging transportation and housing decisions. A number of such subsidies were identified in Part III of this Article, including highway funding, water and sewer funding, tax subsidies to the oil industry, preferential tax treatment for parking benefits, economic development incentives, and mortgage and other housing policies. These provisions should be changed.

Road-centered transportation funding policies, for example, currently fuel excessive driving and sprawl. At the federal level, there has been some attempt to address the funding inequities that have skewed travel behavior and housing choices. The landmark Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991⁶⁸ allowed states to use funds previously restricted to highway spending to support a variety of transportation modes. The Transportation Equity Act for the 21st Century,⁶⁹ which reauthorized ISTEA, further reduced the share of overall transportation funding ded-

TROPOLIS AT CENTURY'S END: PAST AND FUTURE INFLUENCES 10 (Fannie Mae Foundation 1999)).

58. William H. Whyte Jr., *Urban Sprawl*, in *THE EXPLODING METROPOLIS* 133, 144 (William H. Whyte Jr. ed., 1957).

59. *Sierra Club v. Department of Transp.*, 962 F. Supp. 1037, 1043 (N.D. Ill. 1997) (citing *Swain v. Brinegar*, 517 F.2d 766, 777, 5 ELR 20354 (7th Cir. 1975)).

60. U.S. EPA, *TECHNICAL REVIEW*, *supra* note 3.

61. See Parris N. Glendening, *Smart Politics*, ENVTL. F., Jan./Feb. 2004, at 27-28; CONSTANCE E. BEAUMONT, *WHY JOHNNY CAN'T WALK TO SCHOOL: HISTORIC NEIGHBORHOOD SCHOOLS IN THE AGE OF SPRAWL* 17 (National Trust for Historic Preservation, 2d ed. 2002), available at <http://nationaltrust.org/issues/schoolsRpt.pdf> (last visited Sept. 12, 2005).

62. See, e.g., Lewyn, *Suburban Sprawl*, *supra* note 40.

63. See CONSERVATION LAW FOUNDATION, *supra* note 53; DONALD APPEYARD, *LIVABLE STREETS* (1981).

64. Michael Southworth & Eran Ben-Joseph, *Street Standards and the Shaping of Suburbia*, 61 J. AM. PLAN. ASS'N 65 (1995).

65. See Patricia E. Salkin, *From Euclid to Growing Smart: The Transformation of the American Local Land Use Ethic Into Local Land Use and Environmental Controls*, 20 PACE ENVTL. L. REV. 109

(2002); Lee R. Epstein, *Where Yards Are Wide: Have Land Use Planning and Law Gone Astray?*, 21 WM. & MARY ENVTL. L. & POL'Y REV. 345, 347-50 (1997).

66. See Andres Duany & Emily Talen, *Making the Good Easy: The Smart Code Alternative*, 29 FORDHAM URB. L.J. 1445 (2002).

67. A thorough review of potential policy changes is beyond the scope of this Article. A comprehensive approach combining numerous steps will be needed to reduce the environmental damage caused by driving and sprawl. See Pollard, *Smart Growth*, *supra* note 40, for further discussion of a number of promising tools and strategies to promote smarter growth and more sustainable transportation.

68. Pub. L. No. 102-240, 105 Stat. 1914 (1991).

69. Pub. L. No. 105-178, 112 Stat. 107 (1998).

icated exclusively to building highways. However, these and other changes have not fundamentally altered the bias toward funding highways,⁷⁰ and many of the innovations these statutes contain merely authorized states to use federal funds for other transportation alternatives, something most states have not done.⁷¹ A number of states have done more, though, to increase the share of their transportation funding that goes to road maintenance and repair rather than to new construction. New Jersey has been a leader in adopting such a “fix it first” approach, which helps to reduce the subsidies for sprawl and to make existing communities more attractive places to live.⁷²

There also have been efforts at the state and local level to reduce sprawl subsidies by guiding infrastructure funding to existing communities and designated growth areas. Maryland’s Priority Funding Areas Act⁷³ directs state funding for “growth-related” projects such as highways and water and sewer lines to existing communities and developed areas. Additional areas where growth is planned are eligible for funding if they satisfy minimum criteria for average residential density and for providing public water and sewer. Maryland similarly changed its school construction guidelines so that existing communities seeking funds for purposes such as renovating school buildings are given priority over funding for new schools. As a result of this change, funding to upgrade or expand schools shifted from 84% going to new school buildings to 82% going to existing schools.⁷⁴

Reducing parking subsidies would help reduce excessive driving. Federal tax law currently permits employers to deduct the costs of providing employees free or discounted parking, and employees may receive these benefits tax free.⁷⁵ Deductions for free parking are allowed up to \$175 per employee per month, yet transit and vanpool deductions are limited to only \$100 per month, giving a significant extra subsidy for driving. These benefit levels should at least be equal; or perhaps only transit users should be eligible to receive the benefit.⁷⁶ A California statute offers another alternative, requiring certain employers to permit employees to “cash out” parking benefits and receive a cash payment equal to the market value of parking subsidies instead of receiving the subsidy.⁷⁷ Although limited, case studies of this statute indicate that it can reduce solo driving to work by

17% and vehicle miles traveled by 12%, while increasing carpooling to work by 64%, transit commuting by 50%, and bicycling and walking by 39%.⁷⁸

B. Provide Incentives for Less Destructive Choices

A related area of policy changes that can reduce the environmental damage caused by driving and sprawl is to provide incentives for less destructive alternatives.

For one thing, a range of potential measures can increase the convenience and reduce the cost of transit services. Measures that permit transit vehicles to travel faster—such as giving them their own lane and a green light at intersections before other traffic or permitting them to turn onto certain blocks when other vehicles cannot—help transit compete with motor vehicles.⁷⁹ In addition, some localities have offered preferential parking for carpools. A more direct incentive, as mentioned above, would be to reverse the current subsidy for driving and provide a greater level of tax-free transit and vanpool benefits than the level permitted for free parking.

Incentives to encourage the purchase of more fuel-efficient and alternative-fuel vehicles can, if structured properly, reduce gasoline consumption and air pollution by influencing individual car purchase decisions.⁸⁰ Individuals buying a hybrid gas-electric vehicle in 2005 are eligible for a \$2,000 federal tax deduction,⁸¹ and some states offer tax credits on hybrid cars as well. Under the new federal energy law, beginning in 2006, purchasers of hybrid vehicles will be eligible for a tax credit that will vary according to the vehicle’s weight, fuel economy, and other factors but is estimated to range up to \$3,400.⁸²

There also are a rich variety of policies providing incentives to reduce sprawl by promoting development in existing areas. One approach is to offer density bonuses and shorter approval times for infill development and transit-oriented development. Arlington County, Virginia, has used a combination of tools, including such incentives, to promote mixed-use, pedestrian-oriented development around transit stations. Today, virtually all of the office space and about two-thirds of the county’s retail space is within walking distance of transit and the county has the

70. See, e.g., Liam McCann, *TEA-21: Paving Over Efforts to Stem Urban Sprawl and Reduce America’s Dependence on the Automobile*, 23 WM. & MARY ENVTL. L. & POL’Y REV. 857 (1999).

71. SURFACE TRANSPORTATION POLICY PROJECT, CHANGING DIRECTION: FEDERAL TRANSPORTATION SPENDING IN THE 1990s (2000). The new federal transportation law continues this approach. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), 109 Pub. L. No. 59, 119 Stat. 1144 (2005).

72. See 2000 Congestion Relief and Transportation Trust Fund Renewal Act, N.J. STAT. ANN. 27:1B-21.14-21.31; Exec. Order No. 43, Gov. James E. McGreevey, Jan. 7, 2003. See Pollard, *Follow the Money*, *supra* note 40, for further discussion of these statutes and the New Jersey Department of Transportation’s resistance to these efforts.

73. MD. CODE ANN., STATE FIN. & PROC. §§5-7B-01 to 5-7B-10 (2003).

74. Glendening, *supra* note 61, at 27.

75. I.R.C. §132(f) (2002).

76. Mann, *supra* note 47, at 639.

77. CAL. HEALTH & SAFETY CODE §43845 (1992).

78. Donald Shoup, *Evaluating the Effects of Cashing Out Employer-Paid Parking: Eight Case Studies*, 4 TRANSP. POL’Y 201 (1997).

79. VUCHIC, *supra* note 43, at 295.

80. DAVID FRIEDMAN, A NEW ROAD: THE TECHNOLOGY AND POTENTIAL OF HYBRID VEHICLES (Union of Concerned Scientists 2003) (noting that the fuel consumption and emissions from some hybrids could be greater than conventional automobiles). It should be noted that a switch to these types of vehicles will only help address some of the environmental impacts related to driving; they do not reduce impacts such as land use consumption and water runoff from parking lots. Further, it has been argued that even the fuel conservation and air quality benefits of these vehicles may be overstated since the reduced cost of fuel per mile of driving may lead people to drive more miles.

81. Internal Revenue Service, *Clean-Fuel Vehicle Deduction Available for Certain Models*, at <http://www.irs.gov/newsroom/article/0,,id=104549,00.html> (last visited Sept. 12, 2005).

82. American Council for an Energy Efficient Economy, *Light-Duty Hybrid and Diesel Vehicle Tax Credits in the Energy Bill*, at <http://www.aceee.org/transportation/hybtaxcred.htm> (last visited Sept. 19, 2005). There are significant limits to this incentive; the credit can only be claimed on the first 60,000 hybrid vehicles sold by each manufacturer, and it will phase out over time.

highest rate of transit ridership in the state.⁸³ Another approach is to provide incentives such as tax credits, tax abatements, loans, and grants to encourage rehabilitation and reuse of existing structures and properties that have already been developed. Historic preservation incentives are a common and effective tool many states and localities have adopted. In North Carolina, developers estimated that the majority of the projects completed under a tax credit program for rehabilitation of certain types of historic buildings would not have been undertaken without such a credit.⁸⁴ Numerous states and localities also have adopted incentives to encourage redevelopment of abandoned industrial sites, commonly referred to as “brownfields.” Florida, for instance, offers a tax credit that provides an eligible applicant up to 35% of the costs of a voluntary cleanup activity to rehabilitate a brownfield site in a state-designated brownfield area,⁸⁵ and Florida’s economic development incentive program provides an additional bonus for creating jobs in a brownfield area.⁸⁶

C. Provide More Choices

A third area of potential policy changes involves government directly providing individuals with additional choices that offer alternatives to driving and sprawl. These policies can address a significant hurdle to less harmful behavior—the absence of realistic alternatives.

Many communities have little or no transit service or the quality of service is poor. Federal funds for public transportation almost doubled between 1990 and 1998, yet the overall share of transportation funds for transit declined during this period.⁸⁷ Transit services need to be tailored to the needs and characteristics of a particular locality, but a primary limitation to expanding and improving services is a shortage of stable and adequate funding. There are also many potential steps to improve the convenience and accessibility of transit, such as adding more routes and increasing the frequency of service. Even simple steps such as adding bus shelters or providing route and scheduling information at each stop can make transit a more viable option.

Spending to provide and improve bicycle and pedestrian facilities has increased significantly since 1990, largely as a result of the federal Transportation Enhancement program.⁸⁸ However, it remains a very small portion of governmental transportation spending.⁸⁹ A growing number of

states and localities have also increased funding for bicycle and pedestrian projects through Safe Routes to School programs to improve safety and facilities so that children can bicycle or walk to school. California has been a leader in this effort, dedicating one-third of the federal transportation safety funds it receives to such a program.⁹⁰ The new federal transportation law builds on these programs, creating a national Safe Routes to School program and authorizing \$612 million through 2009 for this initiative.⁹¹

The attractiveness, convenience, and utility of transportation choices can be significantly enhanced by increasing connectivity within and among different transportation modes. Connecting roads to create a network of streets increases the choice of routes available to drivers, and can reduce the amount of driving and congestion that results from building cul-de-sacs and funneling cars onto a relatively small number of roads. Linking various transportation modes can also improve the convenience and attractiveness of alternatives, such as connecting transit and bicycle networks by adding bike racks to buses. Linking transportation and land use plans and investments has even greater potential to provide more meaningful choices. Local governments in the Charlotte-Mecklenburg area of North Carolina, for example, created a long-range transit and land use plan that calls for investing \$1 billion in a mix of transit improvements to create a broader range of transportation choices and also outlines local land use steps to guide growth to designated corridors and centers served by transit. New and expanded transit services have already helped increase ridership by 31% between 1998 and 2003.⁹²

D. Remove Regulatory Barriers to Less Destructive Behavior

A fourth area of significant opportunity for policy changes to reduce the harmful environmental impact of individual behavior is to alter regulations that currently mandate harmful behavior or limit less destructive alternatives.

A number of the regulations identified in Part III that currently promote sprawl and excessive driving are prime targets for reform. Parking requirements that subsidize driving and consume land by mandating building an excessive amount of free parking could be reduced or eliminated and should be revised to encourage uses to share parking where feasible. Street design standards that lead to overly wide roads, and thus harm existing communities and spur sprawl in new communities, should be amended to reduce the adverse impacts of automobiles on neighborhoods and to encourage walking and bicycling.

Zoning requirements also frequently need to be overhauled, particularly those that stipulate single-use areas, minimum lot sizes, and minimum setbacks, thereby unnecessarily restricting housing and transportation choices. At the very least, these ordinances should be revised to permit a mix of residential and commercial uses and a diversity of housing types in many more areas.⁹³ Alternatively, localities

83. TRIP POLLARD, *WHERE ARE WE GROWING?: LAND USE AND TRANSPORTATION IN VIRGINIA* 28 (Southern Environmental Law Center 2002), available at http://www.southernenvironment.org/PDFS/Virginia_Report_2002.pdf (last visited Sept. 12, 2005).

84. North Carolina Department of Cultural Resources, State Historic Preservation Office, *The Economic Impact of the Rehabilitation Investment Tax Credit Program in North Carolina* (Dec. 31, 2003), available at <http://www.hpo.dcr.state.nc.us/ta90nc.htm> (last visited Sept. 12, 2005).

85. FLA. STAT. §§199.1055, 220.1845 (2005); see also Tara Burns Koch, *Betting on Brownfields—Does Florida’s Brownfields Redevelopment Act Transform Liability Into Opportunity?*, 28 STETSON L. REV. 171 (1998).

86. FLA. STAT. §288.107 (2005).

87. SURFACE TRANSPORTATION POLICY PROJECT, *supra* note 71, at 5.

88. Each state is required by federal law to set aside 10% of the federal Surface Transportation Program funds it receives for transportation enhancements.

89. *Id.* at 12 (federal spending on pedestrian and bicycle projects rose from just over \$7 million in 1990 to more than \$222 million by 1999).

90. CAL. CODE, STS. & HIGH. §2333.5 (2004).

91. SAFETEA-LU §§1101(a)(17), 1404 (2005).

92. CHARLOTTE AREA TRANSIT SYSTEM, *CATS 2003 ANNUAL REPORT* (2003).

93. It has been noted that merely permitting mixed-use zoning does not necessarily reduce sprawl and may encourage it if it merely promotes replicating commercial uses in suburban areas. See Nicholas

can shift from a proscriptive approach restricting the type of development that can take place to a more prescriptive approach that can guide development patterns, promoting compact, mixed-use neighborhoods.⁹⁴ A growing number of localities have revised regulatory provisions to eliminate barriers to developing more compact, traditional neighborhoods and towns.⁹⁵

V. Conclusion

The potential to reduce the environmental damage caused by individual behavior is enormous. Some of the most promising opportunities involve changing a host of public policies that promote excessive driving and sprawl.

There are considerable hurdles to adopting many of these changes, including the size and power of transportation bureaucracies resistant to change and special interest groups that profit from policies favoring automobile dependence and sprawl, as well as potential public resistance to change.⁹⁶ In spite of these barriers, the significant—and rising—costs of current transportation and land development patterns to individuals and taxpayers are fueling both behavioral changes and demand for policy changes. For example, most people enjoy driving but hate sitting in traffic. As a result, there is significant support for steps such as increased funding for transportation alternatives,⁹⁷ and experience suggests that many people will use transportation alternatives that are available, safe, convenient, and attractive.⁹⁸ It is also clear that a significant market segment prefers to

live in a traditional neighborhood if such homes are available.⁹⁹ Moreover, demographic changes—including the projected near doubling of the senior population by 2030¹⁰⁰ and the rise of single-adult households,¹⁰¹ segments of the population that often find dispersed, automobile-dependent housing with a large lot to maintain unappealing¹⁰²—are driving the demand for a greater range of transportation and housing alternatives. Finally, many people are unaware of the environmental impact of individual transportation and housing decisions; providing better information and conducting public education campaigns can enable people to make more informed choices and may trigger personal and social norms that will further reduce damaging individual behavior.¹⁰³

The policy changes outlined in this Article are just a sample of the potential opportunities to address environmentally harmful behavior. These changes do not entail regulations restricting individual choices; instead, they would provide more transportation and housing options through eliminating subsidies for damaging behavior, removing barriers to less destructive alternatives that many people desire, and providing more environmentally sound alternatives. The increased focus on individual environmental behavior can help to identify these promising options and thus provide important new directions for environmental protection.

M. Kublicki, *Innovative Solutions to Euclidean Sprawl*, 31 ELR 11001 (Aug. 2001).

94. See Pollard, *supra* note 1, at 257; Duany & Talen, *supra* note 66, at 1452-53.

95. LOCAL GOVERNMENT COMMISSION, SMART GROWTH ZONING CODES: A RESOURCE GUIDE (2003).

96. See Pollard, *supra* note 1, at 275-84, and Pollard, *Smart Growth*, *supra* note 40, at 1552-54, for further discussion of some of these hurdles.

97. Polls consistently show much stronger support for expanding public transportation and building bikeways and sidewalks than for new highway construction. See FEDERAL HIGHWAY ADMINISTRATION, MOVING AHEAD: THE AMERICAN PUBLIC SPEAKS ON ROADWAYS AND TRANSPORTATION IN COMMUNITIES 5 (2000). It has been estimated that in 2004, almost 80% of ballot measures including transit funding passed. Center for Transportation Excellence, *2004 Elections: News and Information*, at http://www.cfte.org/success/2004_elections.asp (last visited Sept. 13, 2005).

98. Nationwide, people took 9.4 billion trips that used public transportation in 2003, an increase of almost 22% since 1995. AMERICAN PUBLIC TRANSPORTATION ASS'N, 2005 PUBLIC TRANSPORTATION FACT BOOK viii (2005), available at <http://www.apta.com/research/stats/factbook/index.cfm> (last visited Sept. 13, 2005). See also PRICE-WATERHOUSECOOPERS & URBAN LAND INSTITUTE, EMERGING TRENDS IN REAL ESTATE 2005 (2004) (noting that the desire to avoid long commutes favors real estate investments in areas with strong mass transit networks).

99. See, e.g., BELDEN RUSSONELLO & STEWART, 2004 AMERICAN COMMUNITY SURVEY (2004) (conducted for Smart Growth America and National Association of Realtors), available at <http://www.smartgrowthamerica.org/NAR-SGAsurvey.pdf> (last visited Sept. 13, 2005).

100. See, e.g., JOINT CENTER FOR HOUSING STUDIES OF HARVARD UNIVERSITY, HOUSING AMERICA'S SENIORS 1 (2000). This is by far the fastest growing segment of the American public. See U.S. CENSUS BUREAU, U.S. INTERIM PROJECTIONS BY AGE, RACE, AND HISPANIC ORIGIN tbl. 2b (2004), available at <http://www.census.gov/ipc/www/usinterimproj> (last visited Sept. 19, 2005).

101. A recent report found that single-adult households have supplanted two-parent households as the most common kind in the United States. FRANK HOBBS, CENSUS 2000 SPECIAL REPORTS, EXAMINING AMERICAN HOUSEHOLD COMPOSITION: 1990 AND 2000, at 1 (U.S. Census Bureau 2005), available at <http://www.census.gov/prod/2005pubs/censr-24.pdf> (last visited Sept. 19, 2005).

102. See, e.g., Susan Bradford Barror, *Mature Buyers: The Next Wave*, BUILDER, July 1997, at 68. It has been suggested that "[o]ur suburbs are designed around a stereotypical household that is no longer predominant." PETER CALTHORPE, THE NEXT AMERICAN METROPOLIS: ECOLOGY, COMMUNITY, AND THE AMERICAN DREAM 18 (1993).

103. See Vandenberg, *From Smokestack to SUV*, *supra* note 2, at 608. It has been suggested, for example, that "[i]f development patterns continue to be seen purely as a reflection of individual consumer choice, they are likely to persist. However, if the collective consequences of these choices are made public, an appeal could be made to public values and necessary reforms might receive the support they need." Thomas Benton Bare III, *Recharacterizing the Debate: A Critique of Environmental Democracy and an Alternative Approach to the Urban Sprawl Dilemma*, 21 VA. ENVTL. L.J. 455, 494 (2003); see also Lawrence Lessig, *The Regulation of Social Meaning*, 62 U. CHI. L. REV. 943 (1995).