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The Roads More Traveled: Sustainable Transportation in America—Or Not

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The Challenge Before Us

There can be no sustainable development without sustainable transportation. It is an essential component not only because transportation is a prerequisite to development in general but also because transportation, especially our use of motorized vehicles, contributes substantially to a wide range of environmental problems, including energy waste, global warming, degradation of air and water, noise, ecosystem loss and fragmentation, and desecration of the landscape. Our nation's environmental quality will be sustainable only if we pursue transportation in a sustainable way.

It will be a challenge to bring this about. Over the next 25 years, the population in the United States is predicted to grow by some 60 million people; the gross domestic product is projected to approach \$30 trillion (a 50% increase in real terms over today's levels); and annual passenger miles traveled in motor vehicles are expected to increase from 5 trillion miles in 2000 to 8.4 trillion miles in 2025. As the population and economy grow, Americans are likely to become increasingly more mobile, with increasingly larger impacts on the environment.¹

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[*Editors' Note:* In June 1992, at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, the nations of the world formally endorsed the concept of sustainable development and agreed to a plan of action for achieving it. One of those nations was the United States. In August 2002, at the World Summit on Sustainable Development, these nations will gather in Johannesburg to review progress in the 10-year period since UNCED and to identify steps that need to be taken next. In anticipation of the Rio + 10 summit conference, Prof. John C. Dernbach is editing a book that assesses progress that the United States has made on sustainable development in the past 10 years and recommends next steps. The book, which is scheduled to be published by the Environmental Law Institute in June 2002, comprises chapters on various subjects by experts from around the country. This Article will appear as a chapter in that book. Further information on the book will be available at www.eli.org or by calling 1-800-433-5120 or 202-939-3844.]

1. See discussion in NATIONAL ACADEMY OF SCIENCES (NAS) & NATIONAL RESEARCH COUNCIL (NRC), SURFACE TRANSPORTATION ENVIRONMENTAL RESEARCH: A LONG-TERM STRATEGY (REPORT OF THE SURFACE TRANSPORTATION ENVIRONMENTAL COOPERATIVE RESEARCH PUBLIC ADVISORY BOARD (publication pending in 2002).

This Article explores some basic parameters of sustainability in transportation, with particular emphasis on the obligations and actions of the United States regarding the issue since the 1992 Earth Summit. It focuses primarily on the patterns and trends associated with motor vehicle use, and with the federal influence on road transportation planning and investment; for the most part, it does not address matters relating to fuel efficiency and emissions control through vehicle technology.²

In general, the concept of "sustainable" transportation invokes a system that allows free movement of people and goods in perpetuity, without harm to human health or the environment, and without depletion of the resources upon which it or a healthy environment depends. The concept, in our view, also embraces a system in which citizens and government collaborate to make decisions and provide a range of mobility choices. These elements were essentially recognized and endorsed at the Earth Summit and in the official American documents on sustainability that followed. Unfortunately, recent transportation and environmental trends in the United States, revealing substantially increased rates of driving and resource consumption along with associated continuing pollution, do not appear sustainable.

The good news is that the legal and political framework for sustainability in American transportation has indeed improved since the Earth Summit, and that in many parts of the country things have begun to move in the right direction. The bad news is that we have a long, long way to go.

In the 1990s and early 21st century, federal law and policy have finally begun to improve the chances for achieving a sustainable transportation system, particularly through implementation of changes to comprehensive transportation and pollution control legislation.³ Many states and communities have taken advantage of new programs to increase modal choice and strengthen community involvement in decisionmaking, and there are encouraging signs among some indicators of environmental performance. There is also substantial evidence, however, that we have not yet

2. This Article also does not discuss issues relating to airborne or waterborne transportation, which are beyond the authors' expertise. For a publication that does, see FEDERAL TRANSPORTATION ADVISORY GROUP, NATIONAL SCIENCE AND TECHNOLOGY COUNCIL, VISION 2050: AN INTEGRATED NATIONAL TRANSPORTATION SYSTEM (2001).

3. For citations, see detailed discussion of U.S. federal transportation policy since the Earth Summit below in the text accompanying footnotes 40 to 68.

gone far enough to reverse pollution and consumption trends and to achieve sustainability. In some ways, the American experience contrasts with that taken in Europe, where more progressive transportation and land development policies are yielding results by making it easier for citizens to choose alternatives to driving.

As we develop environmental and transportation policies for the 21st century, there are some steps we can and must take to achieve the sustainable future envisioned at the Earth Summit. These include building upon the legal and policy reforms adopted in the last decade, establishing performance goals for sustainability, improving methods of analysis and review of project and policy alternatives, using market-based incentives, building communities to support walking, bicycling, and use of public transit, and improving vehicle efficiency standards.

It is critical to do this, for otherwise today's children and future generations will inherit a world in which increasingly their choices are curtailed, their health threatened, and the richness and beauty of their homeland diminished by transportation gridlock and associated pollution and consumption. The health and future of our nation's economy also are utterly dependent on our achievement of a more sustainable and efficient system of mobility; we cannot grow and prosper if we waste time and resources in a system that does not work. While our recent progress in achieving transportation sustainability is significant, it is not enough. We cannot afford interruption or delay in pursuing these goals.

Sustainability in Road Transportation

There is no single, generally accepted definition of "sustainable transportation." Rather, as is the case with other aspects of sustainable development, the concept is evolving, as we learn more about the consequences of our patterns of mobility and the strategies we have on hand to address them. There are some basic elements, however, that we believe essential to any serious approach to the issue. These elements are essentially reflected in Agenda 21, the international agreement adopted at the Earth Summit, although that document is not overly articulate on the point. In the United States, the President's Council on Sustainable Development (PCSD) has also adopted some useful elaboration of its own, particularly in its working documents.

Some Basic Precepts of Sustainable Transportation

In brief, sustainable transportation strategies are those that can meet the basic mobility needs of all and be continued into the foreseeable future without harm to human health or deterioration of the local or planetary resource base. The concept calls for a more holistic approach to policy and investment planning in order to achieve a diverse and balanced mix of transport modes, along with a sensible arrangement of land use that enables conservative use of energy and capital to fulfill mobility needs.⁴

Especially in the United States, the concept must account for the enormous prominence of transportation in our society and economy. Since World War II, improved transportation and manufacturing technologies have contributed to

steady increases in productivity in the United States and a rising standard of living that accommodated not only an increase in population of 130 million people but also a tripling of annual personal expenditures on an inflation-adjusted, per capita basis in the last half of the 20th century.⁵

Automobiles, trucks, and highways became the dominant means of surface transportation in America throughout this period, contributing to the nation's growth and expansion while heavily influencing our economy, land development patterns, and culture. Use of private vehicles has become the rule rather than the exception for those of driving age and, today, over 95% of our personal trips are by personal vehicles. Truck usage now accounts for over 90% of all shipments. There are now more than 200 million vehicles traveling 5 trillion miles per year in the United States.⁶

Both a cause and result of our heavy reliance on motor vehicles, the traditional paradigm for transportation planning in the United States has sought to maximize roadway capacity, travel speed, and mobility, generally within the context of large subsidies to motorized transportation. The emerging sustainable transportation paradigm, by contrast, seeks to maximize efficiency in overall resource use. Its basic components include increasing modal diversity, with more emphasis on public transit, walking, and bicycling; paying more attention to the pattern of transportation and land use; encouraging use of efficient transportation modes whenever practical; charging users the true costs of transportation; and encouraging better connectivity between modes.

Ecological systems are healthiest when they display great species diversity and many niches for specialization of function and resource use. So too are transportation systems healthiest when they display great modal diversity, offering opportunity for selection of the most efficient specialized mode or combination of modes to meet different functional and qualitative demands for the movement of people or goods.

In further understanding transportation sustainability, it is important to remember that, at any point in time, consumers of transportation services are typically faced with a constrained set of choices among different travel modes for a particular trip or movement of goods; whether it is convenient to drive or walk to a particular destination, for example, is a function of the transportation infrastructure and services provided by a community, the price of those services, and the arrangement of land uses that generate the need for transportation. These, in turn, are the product of historical development and investment patterns, which shape the distance and speed with which people and goods move within the community to make possible the ordinary transactions of everyday life and economy. Together, these factors determine the level of energy and resource use, pollution, cost, and ultimately the sustainability of the transport and land use pattern of cities.

Unfortunately, the current pattern of metropolitan transportation and land development in the majority of countries around the world appears to be increasingly unsustainable from both an economic and environmental perspective. Many factors point to the need for a new paradigm for sus-

4. For a more thorough explication, see Michael Replogle, *Sustainability: A Vital Concept for Transportation Planning and Development*, J. ADVANCED TRANSP., Spring 1991, at 3-18.

5. See NAS, SURFACE TRANSPORTATION ENVIRONMENTAL RESEARCH: A LONG-TERM STRATEGY (REPORT OF THE SURFACE TRANSPORTATION ENVIRONMENTAL COOPERATIVE RESEARCH PUBLIC ADVISORY BOARD (prepublication draft 2001).

6. *Id.*

tainable transportation and development in both high- and low-income countries—burgeoning populations, lingering or growing air pollution, limits on global petroleum reserves, limited physical and economic capacity to expand automobile-based transportation systems without unacceptable community destruction, and an urgent need to limit global carbon dioxide (CO₂) emissions to slow the pace of global warming.

Sustainable Transportation at the Earth Summit

The Agenda 21 language agreed to in Rio de Janeiro at the Earth Summit is essentially consistent with this philosophy of sustainable transportation. In particular, Agenda 21 specifies the following objective for transportation:

The basic objective of this programme area is to develop and promote cost-effective policies or programmes, as appropriate, to limit, reduce or control, as appropriate, harmful emissions into the atmosphere and other adverse environmental effects of the transport sector, taking into account development priorities as well as the specific local and national circumstances and safety aspects.⁷

The document also charges signatory governments with developing and promoting “more efficient, less polluting and safer” transportation, and to do so by emphasizing less polluting modes and integrating transportation and land use planning, among other things.⁸

In addition to this specific language on transportation, several of the broad principles adopted in the Rio Declaration on Environment and Development are of particular relevance to achieving sustainability in transportation. The issue of greenhouse gas emissions from transportation, for example, is invoked by the admonition that activities in one nation must not damage the environment of another (Principle 2); the need to incorporate environmental sensitivity into land use and transportation planning is suggested by the direction that environmental protection be an integral part of development rather than separated from it; the need for community involvement in transportation decisionmaking is invoked by the language on public awareness and participation; the need to consider environmental costs in economic analysis is raised by the direction on internalization of environmental costs and the use of market-based remedies; and environmental impact assessment of government actions is required directly.⁹

The Work of the PCSD

In June 1993, President William J. Clinton established an advisory process, the PCSD, directly in response to the Earth Summit. Its purpose was to advise him on sustainable development and develop “bold, new approaches to achieve our economic, environmental, and equity goals.”¹⁰ The

PCSD produced a series of reports and recommendations throughout the remainder of the decade that collectively shed further light on concepts of sustainability, as well as on the response of the American government to its new international obligations.

It is fair to say that the work of the PCSD related to transportation planning and management was somewhat scattered and arbitrary, varying in emphasis and structure from one report to another. Nonetheless, it appears that the PCSD’s work was well-intentioned and, taken as a whole, it seeks to move the country toward patterns of vehicle use and land development that reduce pollution and congestion.

The main report of the PCSD, in particular, did not emphasize transportation in its policy recommendations. The document did include the subject, however, in its chapter on “strengthening communities.” Indeed, perhaps its strongest recommendation on transportation was buried in the last of a range of actions recommended under the growth-management category, where the PCSD noted that the federal government should “encourage shifts in transportation spending toward transit, highway maintenance and repair, and expansion of transit options other than new highway or beltway construction.”¹¹

In the “community design” section of the same chapter, the PCSD also encouraged land development “along transit corridors” and “near a range of transit alternatives,” and it recommended that federal tax law be amended to provide the same treatment for benefits provided to employees who use alternative forms of transportation as for those provided to employees who use company-provided parking. It recommended that credit toward attainment of air quality goals under the Clean Air Act (CAA)¹² be given to communities that adopt efficient land use strategies to reduce pollution from motor vehicles.¹³

The report urged all levels of government to take care that infrastructure investment, including roads, does not disproportionately favor wealthy communities over disadvantaged ones, and it recommended that the multidisciplinary, inclusive planning process that had been established in 1991 under the Intermodal Surface Transportation Efficiency Act (ISTEA)¹⁴ be extended to local community planning generally. (We discuss ISTEA in detail below.)¹⁵ And it urged communities to pursue alternatives to sprawling land development, including the use of “location-efficient” mortgages that reward homebuyers who save on transportation expenses by purchasing homes in neighborhoods that are less automobile-dependent.¹⁶

The transportation topic was fleshed out more specifically in a separate task force report on energy and transportation, issued concurrently with the main report. The task force report established several laudable goals (“indicators”

7. U.N. Conference on Environment and Development (UNCED), Agenda 21, U.N. Doc. A/CONF.151.26 (1992), ¶ 9.15 [hereinafter UNCED].

8. Governments are also encouraged to pursue technology transfer and research and to hold regional conferences on transportation and the environment. *Id.*

9. See Rio Declaration on Environment and Development, U.N. Doc. A/CONF.151/5/Rev. 1, 31 I.L.M. 874 (1992), princs. 4, 10, 16 & 17.

10. See Exec. Order No. 12852, 58 Fed. Reg. 35841 (June 29, 1993), ADMIN. MAT. 45058.

11. PRESIDENT’S COUNCIL ON SUSTAINABLE DEVELOPMENT (PCSD), SUSTAINABLE AMERICA: A NEW CONSENSUS 99 (1996) (from Policy Recommendation 5, Action 6 in Chapter 4) [hereinafter PCSD: A NEW CONSENSUS].

12. 42 U.S.C. §§7401-7671q, ELR STAT. CAA §§101-618.

13. PCSD: A NEW CONSENSUS, *supra* note 11, at 97-98 (Policy Recommendation 4).

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

15. See discussion of ISTEA below in text accompanying footnotes 40 to 52.

16. PCSD: A NEW CONSENSUS, *supra* note 11, at 97-99.

in PCSD parlance), for example, in measuring progress in sustainable transportation:

- Reducing dependence on imported oil;
- Decreasing traffic congestion;
- Reducing greenhouse gas emissions per passenger-mile of travel 20% by 2010 and 40% by 2025;
- Stabilizing vehicle miles traveled per capita while improving alternatives to driving in single-occupancy vehicles; and
- Increasing the mode share of trips made by alternatives to personal motor vehicles to 30% by 2025.¹⁷

The task force also specified its own policy recommendations, including three that relate directly to transportation planning and management: adoption of so-called congestion pricing and other market-based incentives to reduce and redistribute vehicle traffic; location-efficient mortgages, mentioned above; and a strong recommendation that the U.S. Congress reauthorize the planning and funding reforms of ISTEA.¹⁸

Yet another report relating to the topic was produced by the task force on sustainable communities, which echoed the main report by including recommendations that tax policy be changed to provide equity for employee transportation options other than driving and parking, that CAA credits be given for land use strategies that can reduce automobile use, and that the federal government should shift transportation toward public transit and away from expanding highways. The sustainable communities task force also adopted a number of measures indirectly related to transportation by addressing suburban sprawl, which is linked to automobile dependence.¹⁹

The work of the PCSD concluded with a 1999 final report, *Towards a Sustainable America*. That report, which at the direction of the Clinton Administration focused on certain limited issues, addressed transportation in its chapter on climate change. It recommended reducing greenhouse gas emissions from vehicles by development of cleaner fuels and engines and by reducing vehicle use. The report included 10 so-called actions that encouraged policies to favor the use of mass transit, the building of less automobile-dependent land development, pricing strategies, and research.²⁰

The so-called Car Talk committee that was convened by the Clinton Administration in the mid-1990s to examine approaches to reducing greenhouse gas emissions from transportation reached similar conclusions. Car Talk, like the PCSD, included representatives from a broad range of interests, including the large U.S. automobile manufacturers; several large energy companies; and a number of additional government, business, and environmental interests. Car Talk was generally less successful than the PCSD, in that it failed to reach consensus on certain key points, notably increased gasoline taxes and vehicle fuel economy standards. Nevertheless, the committee was strong in its approval of

ISTEA and its recommendation that “the flexibility, planning, public involvement and program emphases of ISTEA” should be extended to other government programs. The committee also endorsed “the development of a bicycle and pedestrian infrastructure in communities throughout America through continuation of ISTEA funding programs.”²¹

Efforts of the United States Since the Earth Summit

As noted above, achieving sustainability in American transportation is a monumental task, given the extent to which our current transportation patterns have become entrenched in our economy and society. As we will discuss, the environmental impacts of these patterns are enormous. A number of statutory reforms are making a difference, however. We still have a long way to go, but a path is being forged. In addition, there are valuable lessons we can take from other countries that in some ways are ahead of the United States in adopting sustainable transportation practices.

Unsustainable Transportation Patterns in the United States

Most of the environmental impacts of transportation are directly related to the extent to which we rely on motor vehicles for personal travel and freight movement. In particular, motor vehicle miles traveled in the United States have been on an upward trend for several decades. Vehicle use in America doubled from one to two trillion miles per year between 1970 and 1990, and had climbed further to 2.6 trillion miles by 1998.²² Over a longer span, from 1950 to 1990, total passenger vehicle miles increased at an average rate of 4.2% per year; in the 1980s, passenger-vehicle usage grew at the faster rate of 4.7% per year, and total miles traveled by all light-duty vehicles grew at a staggering rate of 5.5% per year.²³

In the 1990s, the rate of growth in vehicle miles traveled slowed somewhat. For the most recent five years of data (1996 through 2000), driving grew at an average rate of over 2% per year, ranging from a 3.1% increase in 1997 to no increase in 2000, a year of higher fuel prices and a dampened economy.²⁴

21. POLICY DIALOGUE ADVISORY COMMITTEE TO RECOMMEND OPTIONS FOR REDUCING GREENHOUSE GAS EMISSIONS FROM PERSONAL MOTOR VEHICLES, MAJORITY REPORT TO THE PRESIDENT 49 (1995).

22. BUREAU OF TRANSPORTATION STATISTICS, U.S. DEPARTMENT OF TRANSPORTATION (U.S. DOT), NATIONAL TRANSPORTATION STATISTICS tbl. 1-29 (2000). This statistic is distinguished from total *passenger* miles traveled, cited above.

23. DON PICKRELL, U.S. DOT, DESCRIPTION OF VMT FORECASTING PROCEDURE FOR “CAR TALK” BASELINE FORECASTS tbl. 2 (1998). See also ENERGY INFORMATION ADMIN., U.S. DEPARTMENT OF ENERGY (U.S. DOE), ANNUAL ENERGY OUTLOOK 1996, at 24 (1996) (DOE/EIA-0383 (96)) [hereinafter ANNUAL ENERGY OUTLOOK].

24. The number of miles driven nationally remained essentially the same from 1999 to 2000. While it is possible that this leveling will be sustained, nothing in the previous four years or the previous three decades indicates that the drop-off represents a trend. In 1999, miles driven increased 2.5%, the same rate of growth observed in 1998 and close to the average annual rate for the 1990s as a whole. The reasons why 2000 was different have yet to be fully explored. Lower rates of driving associated with the energy shortages of the late 1970s and early 1980s were short-lived. It is highly uncertain what effect, if any, military action and other consequences of terrorist attacks in America on September 2001 will have on American travel patterns.

17. PCSD, ENERGY AND TRANSPORTATION: TASK FORCE REPORT 29-36 (1996) (Chapter 3, Goal 3).

18. *Id.* at 51-56, 64-66 (Chapter 3).

19. PCSD, SUSTAINABLE COMMUNITIES: TASK FORCE REPORT 29-30 (1997).

20. PCSD, TOWARDS A SUSTAINABLE AMERICA 21-22 (1999).

A number of troubling additional trends are associated with these high volumes of vehicle use in recent decades, all pointing to increased inefficiency in travel patterns. These include an increase in average trip length, growth in the number of vehicle trips taken per person and per household per year, a decline in all modes of travel other than single-occupancy driving, and a decline in average vehicle occupancy.²⁵ As a result, vehicle use has been growing significantly faster than the population, over four times faster than the driving-age population over the 1980s.²⁶

The absolute and per-capita expansion in vehicle travel has been associated with a number of very significant environmental problems.

Oil Consumption

Transportation is by far the largest consumer of petroleum products in the United States, accounting for some two-thirds of our overall oil consumption.²⁷ As of 1994, the United States was using around 11 million barrels of oil each day to support our transportation habits.²⁸ Slightly more than one-half of U.S. transportation energy is consumed by cars and other personal vehicles, with heavier freight trucks accounting for another 23%.²⁹ Transportation alone consumes more oil than the United States produces, and also more oil than we import, each year.³⁰

Our gluttonous appetite for oil is uniquely American, at least as a matter of degree. The average American citizen uses five times as much energy for transportation as the average Japanese and nearly three times as much as the average citizen of western Europe.³¹ The United States consumes more than one-third of the world's transportation energy, even though we account for only 4.7% of the world's population and less than one-fourth of its combined gross product.³²

25. See also NATIONWIDE PERSONAL TRANSPORTATION SURVEY, BUREAU OF TRANSPORTATION STATISTICS, U.S. DOT, TRAVEL BEHAVIOR ISSUES IN THE '90s, at 11-13 (1992); see also NATIONWIDE PERSONAL TRANSPORTATION SURVEY, BUREAU OF TRANSPORTATION STATISTICS, U.S. DOT, OUR NATION'S TRAVEL: 1995 NPTS EARLY RESULTS REPORT (1997).

26. PICKRELL, *supra* note 23, tbl. 2; see also NATIONWIDE PERSONAL TRANSPORTATION SURVEY, OUR NATION'S TRAVEL, *supra* note 25, at 11, 13.

27. ANNUAL ENERGY OUTLOOK, *supra* note 23, at 48. Other recent sources have put the share as high as 72%. See STACY C. DAVIS & PATRICIA S. HU, OAK RIDGE NATIONAL LABORATORY, TRANSPORTATION ENERGY DATA BOOK 3-3 (1991).

28. ANNUAL ENERGY OUTLOOK, *supra* note 23, at 74. In the *Annual Energy Outlook*, energy uses are expressed in heat content, or British thermal units (BTUs). In 1994, transportation uses accounted for 22.66 quadrillion BTUs (quads) of petroleum consumption. The DOE's standard conversion factors are 5.8 million BTUs per barrel for crude oil consumption and 5.253 million BTUs per barrel for motor gasoline. *Id.* at 269 (Appendix I).

29. OFFICE OF TECHNOLOGY ASSESSMENT, SAVING ENERGY IN U.S. TRANSPORTATION 7-8 (1994).

30. The United States produces 14.1 quads of crude oil domestically each year. Net imports amount to 17.25 quads annually. ANNUAL ENERGY OUTLOOK, *supra* note 23, at 70. See also OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 29, at 2.

31. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 29, at 1, 10.

32. *Id.* at 1-2; ENVIRONMENT AND ENERGY STUDY INST., FACT SHEET: OIL AND TRANSPORTATION (1995), cited in THE ADVOCACY INSTITUTE, GETTING THERE: STRATEGIC FACTS FOR THE TRANSPORTATION ADVOCATE 14, 30 (1996).

Rising Carbon Emissions

Transportation in the United States currently contributes some 450 million metric tons annually of CO₂, a major greenhouse gas, to the atmosphere. This constitutes around 32% of total U.S. carbon emissions, and the amount is growing fast. Carbon emissions from transportation have been growing 20% faster than the overall rate from all sources.

Changes to our climatic patterns from the greenhouse effect have already been detected by a consensus of international scientists, and the eventual damage to human health and ecosystems is predicted to be widespread and very serious. While, as of this writing, it is quite unclear what the ultimate American responses to the accords of the 1992 Earth Summit will be, or whether new agreements will be negotiated, under any scenario it will be difficult to meet our obligations if emissions from the transportation sector are not addressed.

Unhealthy Air Quality

In addition, cars and other highway vehicles constitute a continuing major source of air pollution in the United States. Although in many areas of the country air is getting cleaner with better emissions technology, highway vehicles continue to emit some 60 million tons of carbon monoxide (CO) per year, about 62% of our national inventory of that pollutant. Cars and other highway vehicles continue to emit some seven million tons per year (almost 26%) of our volatile organic compounds (VOCs), and eight million tons per year (about 32%) of our nitrogen oxides (NO_x). VOCs and NO_x are both precursors of ozone smog. Motor vehicles also continue to emit as much as 50% of our carcinogenic and toxic air pollutants, such as benzene and formaldehyde. And heavy vehicles, particularly diesel-powered buses and freight trucks, constitute a significant source of soot and other unhealthy fine particles that, when inhaled, lodge in and damage human tissue.³³

A publication from the U.S. Environmental Protection Agency (EPA) summarizes the situation and suggests the cause:

Despite considerable progress, the overall goal of clean and healthy air continues to elude much of the country. Unhealthy air pollution levels still plague virtually every major city in the United States. This is largely because development and urban sprawl have created new pollution sources and have contributed to a doubling of vehicle travel since 1970.³⁴

EPA scientists believe that current trends in vehicle trips and miles driven, even with continuing but incremental improvements in emission control systems, threaten to reverse the recent national trend of improving air quality by causing total emissions of not just CO₂ but also sulfur dioxide and particulate matter to increase in the near future.³⁵ Total NO_x

33. See discussion and sources cited in F. KAID BENFIELD ET AL., ONCE THERE WERE GREENFIELDS: HOW URBAN SPRAWL IS UNDERMINING AMERICA'S ENVIRONMENT, ECONOMY, AND SOCIAL FABRIC, ch. 2 (NRDC 1999).

34. OFFICE OF MOBILE SOURCES (OMS), U.S. EPA, MOTOR VEHICLES AND THE 1990 CLEAN AIR ACT, FACT SHEET OMS-11 (1994).

35. U.S. EPA, OUR BUILT AND NATURAL ENVIRONMENTS: A TECHNICAL REVIEW OF THE INTERACTIONS BETWEEN LAND USE, TRANSPORTATION, AND ENVIRONMENTAL QUALITY 26 (2001) (EPA 231-R-01-002).

emissions from motor vehicles already are at a higher level than they were two decades ago, despite improvements in the emissions performance of individual vehicles.³⁶ The result is continued impairment of both human health and ecosystem health, including contributions to such recognized ecosystem threats as acid rain and excess nitrogen loading to aquatic and terrestrial systems.

Infrastructure-Related Impacts

Increased driving leads to calls for increased transportation infrastructure, as we add road capacity and other facilities. In some communities, parking lots now constitute the largest single category of land use. Transportation-related pavement is a major source of runoff water pollution in many watersheds, and nonpoint source pollution remains the nation's most serious water quality problem. Although agriculture's unfortunate grip on first-place as a contributor to nonpoint source pollution nationally is not threatened, the impact of pavement on urban and suburban watersheds is immense. Highways also fragment wildlife habitat, bringing new visitors into previously pristine areas. Finally, in the eyes of many, they blemish the visual landscape.³⁷

In addition, it is becoming increasingly clear that new highway capacity can induce additional travel and additional land development, although the extent and workings of this dynamic are still largely to be determined. To the extent this is true, it places transportation in a vicious cycle of increased driving, highway expansion, and new land development, which leads to still more increases in driving, highway expansion, and land development, with no end in sight.

Social and Economic Impacts

Moreover, with increased driving has come increased congestion: Americans now spend roughly one of every eight waking hours in our cars. Seventy percent of peak-hour travel on urban Interstate highways now occurs on congested roads operating at more than 80% capacity. Researchers put the annual cost to the American economy of lost productivity from congestion-related delays at \$78 billion in 1999.³⁸ And, at current rates of population growth and urban expansion, it is prohibitively expensive to try to build our way out of congestion with more and more expensive new highway lanes, even if more roadway space constituted an adequate answer.

Beyond congestion, there are substantial impacts on communities. As investment follows transportation facilities out to the fringe of metropolitan regions, existing communities in central cities and traditional towns can suffer a decline in jobs and opportunity. This can have serious consequences for populations left behind, including a disproportionate number of low-income neighborhoods and communities of color.³⁹

U.S. Federal Transportation Policy Since the Earth Summit

American transportation policy has become increasingly cognizant of these problems. In particular, just as Agenda 21 was being adopted, the United States was entering the beginning stage of a fundamental change in federal transportation policy. For the preceding 50 years, the principal focus of federal influence on transportation planning and management had been the construction of the U.S. Interstate Highway System, arguably the largest and most ambitious public works project in human history. But as the 1990s began, that project, at least as conceived, was nearly complete.

The kind of expansionist philosophy that had given rise to the Interstates was becoming tempered by greater attention to environmental issues associated with transportation and a more pragmatic approach that recognized that there were limits to available federal funding for large construction projects. Even before the Earth Summit, we had begun at least some steps to incorporate the underpinnings of transportation sustainability into law and policy: a more holistic approach to policy and investment planning; a more diverse and balanced mix of transport modes; and a more sensible approach to land use that enables conservative use of energy and capital to fulfill mobility needs.

The Intermodal Surface Transportation Efficiency Act

This new approach found expression in ISTEA, enacted at the end of 1991.⁴⁰ Although the new law continued to authorize a substantial amount of federal funding for highway work, its name suggested the beginning of a new direction: a greater emphasis on all modes of travel, not just highways, and an emphasis on environmental and economic efficiency. Both, of course, are key ingredients of sustainable transportation.

Indeed, in principle the new law was highly compatible with the Agenda 21 recommendations that followed it. For example, ISTEA's first sentence declared that it was the policy of the U.S. government to develop a transportation system that is "economically efficient and environmentally sound" and that will "move individuals and property in an energy efficient way." The law's declaration of policy was expanded in subsections that included three additional references to energy-related concerns and two to reducing air pollution, along with references to providing mobility to elderly, disabled, and economically disadvantaged persons, reducing traffic congestion, and improving quality of life.⁴¹

In general, ISTEA eschewed substantive regulatory requirements in favor of procedural ones that assured the consideration of nationally important goals, along with appropriate funding mechanisms to enable regions and states to put efficiency strategies into effect. The cornerstone of this approach was (and remains) a planning process established for metropolitan areas and states, which reiterated that it was in the national interest to promote planning that will "minimize transportation-related fuel consumption and air pollution." All modes were required to be considered, including

36. U.S. DOT, FEDERAL HIGHWAY ADMIN. (FHWA), TRANSPORTATION AIR QUALITY: SELECTED FACTS AND FIGURES 19 (1996) (FHWA-PD-96-006).

37. BENFIELD ET AL., *supra* note 33.

38. TIM LOMAX & DAVID SCHRANK, TEXAS TRANSPORTATION INST., THE 2001 URBAN MOBILITY REPORT (2001).

39. BENFIELD ET AL., *supra* note 33.

40. Pub. L. No. 102-240, 105 Stat. 1914 (1991). The ISTEA enacted, amended, or repealed over 100 separate sections throughout 10 different titles of the U.S. Code, the most important being Titles 23 and 49.

41. 49 U.S.C. §5501(a), (b)(1), (3), (6).

not just public transit but the provision of pedestrian and bicycle facilities.⁴²

The statute went on to require metropolitan planning organizations (MPOs) to develop long-range transportation plans and near-term transportation improvement programs in accordance with a number of criteria, including consistency with applicable federal, state, and local energy conservation programs and objectives and attention to “the overall social, economic, energy, and environmental effects” of transportation decisions.⁴³ These criteria were supported by others among the so-called 15 factors of MPO planning, including requirements to give priority to using existing transportation systems more efficiently, to consider the impacts of transportation planning on land use, to plan for the efficient movement of freight, and to consider methods to expand, enhance, and increase the use of transit services.⁴⁴ The requirements for statewide transportation planning, which took precedence outside of metropolitan areas, generally duplicated the sustainability-related factors specified for MPOs.⁴⁵

Two additional requirements were particularly important to planning for local and state transportation systems that are environmentally sustainable. First, ISTEA specified that projects may be included in plans only if full funding could reasonably be anticipated for them; this encouraged officials to strive for system efficiency by making the most of available budget resources and discouraged “wish lists” of expensive highway projects that could become entrenched in bureaucratic thinking.⁴⁶ Second, the U.S. Department of Transportation (DOT) interpreted the broad mandate of the law to require that, where the need for a “major metropolitan transportation investment” was identified, studies must be undertaken to evaluate the cost-effectiveness of alternative strategies in meeting local, state, and national objectives.⁴⁷

The federal funding mechanisms of ISTEA complemented the planning features and further enabled and encouraged regions and states to implement sustainable transportation strategies. Foremost among these were the law’s flexible funding procedures, which allowed transportation managers to utilize funds that under previous statutory schemes had been available only for highway construction and maintenance and, pursuant to local discretion, apply them to public transit or other alternative modes. ISTEA’s innovative Surface Transportation Program (STP), was (and, though the law has been amended, remains) available to fund not only highway projects but also transit capital assistance, carpooling initiatives, bicycle and pedestrian facilities, transportation control measures, and other projects.⁴⁸ Additional statutory authority allowing regional and state authorities to transfer funds not needed in other accounts to STP enhanced the inherent flexibility of this program. Accounts that became eligible for transfer

include those for the National Highway System, Interstate highway maintenance, and highway and bridge replacement and rehabilitation.⁴⁹

In addition, ISTEA helped assure that at least some investments were made consistent with energy and environmental objectives by setting aside modest portions of overall federal transportation assistance for these purposes. In particular, 10% of a state’s STP apportionment was required to be set aside for so-called transportation enhancement activities such as pedestrian and bicycle facilities, scenic and historic conservation, and mitigation of water pollution due to highway runoff.⁵⁰ And ISTEA’s Congestion Mitigation and Air Quality (CMAQ) Improvement Program was established to fund transportation control measures and other projects that help localities attain compliance with national air quality standards; such measures often help save energy as well as reduce pollution.⁵¹

Although ISTEA was much more than an environmental or energy policy statute, these features were at its core. They entered the law with strong bipartisan support, and President George H.W. Bush signed the law without reservation on December 18, 1991. Shortly after ISTEA’s enactment, the Bush Administration’s transportation leadership lauded its environmental features.⁵²

ISTEA’s package of goals, safeguards, and incentives also heralded a new era of environmental policy in another respect: instead of command-and-control regulation, the law established a framework for flexibility and partnership government. Standards, goals, criteria, and procedures were set at the federal level but choices about how to meet nationally important objectives were to be made at the local and state levels.

The Transportation Equity Act for the 21st Century (TEA-21)

By 1998, when Congress reauthorized federal transportation legislation, the political climate in Washington had changed considerably. Control of both the House of Representatives and the Senate had passed to the Republican party, and there was strong sentiment to reform many federal programs. Parts of the highway lobby and some lawmakers challenged whether any federal money should be set aside for environmental uses and whether required planning procedures should be retained. Indeed, some questioned whether the federal government should retain any interest in transportation investment, proposing that ISTEA’s categories and safeguards be replaced by a system of block grants to be administered at state discretion. Because of the law’s popularity, however, none of this came to be.

Instead, TEA-21 retained ISTEA’s sustainability features.⁵³ Gains and losses were both minor and essentially balanced each other out. In particular, the planning structure survived with only minor tweaking, the most significant changes being the consolidation of the long list of planning factors into a shorter and more general list of seven, one of

42. 23 U.S.C. §134(a).

43. *Id.* §134(f)(2), (13).

44. *Id.* §134(f)(1), (4), (11), (14).

45. *See id.* §135(c).

46. *Id.* §§134(h)(5), 135(f)(2).

47. 23 C.F.R. §450.318. Although amended by subsequent legislation, the concept also was referenced in the Federal Transit Act and in subsection (h)(4) of the MPOs planning requirements, 23 U.S.C. §134(h)(4). *See* U.S. DOT, *Statewide Planning; Metropolitan Planning*, 58 Fed. Reg. 58040, 58056 (Oct. 28, 1993).

48. 23 U.S.C. §133.

49. *Id.* §§103, 104(c), 119(f), 144(g).

50. *Id.* §133.

51. *Id.* §149.

52. *See, e.g.*, FHWA, *ENVIRONMENTAL PROGRAMS AND PROVISIONS (1992)* (FHWA-PD-92-012); U.S. DOT, *ISTEA OF 1991 (1992)* (FHWA-PL-92-008).

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

them to “protect and enhance the environment, promote energy conservation, and improve quality of life,”⁵⁴ and the clarification that major investment studies were not to be undertaken separately from the planning and project review processes but integrated within them.⁵⁵ Funding for the dedicated CMAQ and enhancements programs increased in size under the new law, although some of the increase (not the base funding) is now subject to transfer at state and local option to other categories, as most highway funding has been since ISTEA.⁵⁶

In addition, the reauthorized law contains a number of additional “green” features relevant to sustainability:

A new pilot program to encourage states and metro areas to employ innovative land use incentives and controls to curb sprawl and reduce automobile dependence⁵⁷;

A new welfare-to-work program designed to strengthen the ability of public transit systems to accommodate “reverse” and suburb-to-suburb commuting⁵⁸;

Continued requirements that certain minimums be spent on system preservation rather than new highway expansion or construction; and⁵⁹

A dramatic increase in authorized spending for mass transit systems.⁶⁰

On the opposite side, a feature of the new law that has been particularly worrisome to the environmental community is the so-called streamlining provision designed to speed up review of proposed highway and other transportation projects without compromising environmental standards.⁶¹ Congress rejected alternate versions of the provision that contained stringent features proposed by the highway lobby, but opponents fear that environmentally destructive projects could be rushed through state and federal procedures if it is interpreted liberally. The provision remains controversial and implementing regulations have been the subject of congressional hearings and a contentious rule-making process.⁶²

In addition, there has been concern over the sheer amount of transportation spending authorized by the law, over \$200 billion (40% more than authorized in ISTEA) spread over six years. Although much of this money could go to sprawl-inducing highway construction, the bulk can be used

at local option not only for new highways but also for maintenance of existing ones, or for public transit.⁶³

The CAA

Besides the major transportation statutes, the federal law with the most direct relevance to environmental sustainability in transportation is the CAA, particularly its so-called conformity provision that requires transportation plans in areas with significant air pollution to help achieve compliance with air quality goals and plans. Although added to the CAA in 1977, the conformity provision was strengthened considerably in the 1990 CAA Amendments.⁶⁴ EPA has implemented the provision with a complex scheme under which the vehicle emissions associated with highways and other new transportation projects must be estimated as precisely as possible and compared with schedules established in state implementation plans for attainment of the CAA’s air quality goals.⁶⁵

Companion provisions were inserted in the transportation statutes. One requires that federal-aid highway construction be consistent with plans for assuring the attainment or maintenance of air quality goals.⁶⁶ Another, provides more specifically that in metropolitan areas classified as polluted (nonattainment) with ozone or CO, federal-aid highway projects may not increase carrying capacity for single-occupant vehicles unless they are part of approved congestion management plans.⁶⁷

As a result of these provisions, regional transportation systems in nonattainment areas must now be designed specifically to limit emissions from transportation sources to the levels set by states in their clean air implementation plans.⁶⁸ While the CAA’s scheme for regulating sources of pollution is nothing if not complicated, in essence it requires that state implementation plans (SIPs) for achieving healthful air quality in polluted areas establish separate emission “budgets” for mobile sources (cars and trucks), stationary sources (power plants and factories), and area sources (paints, agriculture), along with control strategies limiting emissions from each. Trade offs may be negotiated among the various sources, encouraging exploration of the lowest cost means for timely attainment. The conformity provisions require both short-term (three-year) transportation-funding programs and long-term (20-year) regional transportation plans to conform to these emission budgets, so that new transportation investments will not cause violation of the SIP emission limits or delay in timely air quality attainment.

Making a Difference, but Still Far to Go

There is no question that these new initiatives in the 1990s have catalyzed new ways of thinking about transportation investments that can move the country closer to sustainability. We have adopted a framework much more conducive to holistic, inclusive planning, with greater con-

54. 23 U.S.C. §§134(f)(1), 135(c)(1). The planning factors were arguably weakened by the insertion of a provision clarifying that an MPO’s or state’s failure to comply with them is not reviewable in court.

55. Pub. L. No. 105-178, §1308, 112 Stat. 107, 231.

56. See discussion in SURFACE TRANSPORTATION POLICY PROJECT (STPP), TEA-21 USER’S GUIDE 12-26 (1998).

57. 23 U.S.C. §101 note.

58. 49 U.S.C. §5309 note.

59. 23 U.S.C. §§104, 110, 119(a). See also STPP, TEA-21 USER’S GUIDE, *supra* note 56, at 12, 25-26, 55-60.

60. See discussion in AMERICAN PUBLIC TRANSIT ASS’N, TRANSPORTATION EQUITY ACT FOR THE 21ST CENTURY (TEA-21), available at <http://www.apta.com/govt/legis/tea21/> (last visited Jan. 28, 2002). See also STPP, TEA-21 USER’S GUIDE, *supra* note 56, at 55-60.

61. Pub. L. No. 105-178, 112 Stat. 107, codified at 23 U.S.C. §109 note.

62. See, e.g., NRDC, COMMENTS ON FEDERAL HIGHWAY ADMINISTRATION’S DOCKET NOS. 99-5933 AND 99-5989 (2000); STPP, TEA-21 USER’S GUIDE, *supra* note 56, at 44-48. The rulemaking remains unsettled as this Article is being written.

63. STPP, TEA-21 USER’S GUIDE, *supra* note 56, at 42-44.

64. 42 U.S.C. §7506(c), ELR STAT. CAA §176(c).

65. See 40 C.F.R. pt. 93.

66. 23 U.S.C. §109(j).

67. *Id.* §134(l).

68. See 40 C.F.R. pt. 93.

sideration of environmental issues. In many respects, we have laid a foundation for achieving Agenda 21's goals of "more efficient, less polluting and safer" transportation,⁶⁹ with more emphasis on less polluting modes and to integrating transportation and land use planning. The journey has begun; the destination remains elusive, however, and we will have to do more to reach it.

Changes in Spending and Planning

We can measure some progress on the path to sustainability. An analysis of federal transportation spending by the Surface Transportation Policy Project (STPP) found, in particular, that in the 1990s the amount of federal money spent on road repair (instead of new construction) and on modes other than driving increased: the share of federal funds going to road repair grew from 39% in 1990 to 49% in 1998. Spending on public transportation almost doubled, from about \$3 billion in 1990 to almost \$6 billion in 1999.⁷⁰

Changes in planning have accompanied the changes in spending patterns. In the Atlanta, Georgia, region—one of the nation's most sprawling, automobile-oriented, and polluted—a new regional commission has been established to guide transportation and land use planning and management. Created by state law after years of litigation in which the region's transportation plans were found out of conformity with the CAA, the new commission has the authority to override county or local government decisions that it finds inconsistent with the region's long-range goals of reducing growth in vehicle traffic and pollution. In one of the region's bold new initiatives, some \$350 million is slated to be spent in the next 25 years on transportation improvements specifically linked to "smart growth" projects—those designed to slow traffic growth by substituting compact, mixed use, transit-oriented land development for suburban sprawl. The Atlanta initiative is modeled after a similar program recently undertaken in the San Francisco Bay area.⁷¹

In the Albany, New York, metropolitan region, planners for the first time undertook a comprehensive consensus-building process pursuant to ISTEA to choose a multimodal transportation scheme for the region's future. The process was assisted by a number of system performance indicators, including a measure of the gallons of fuel per day that are likely to be consumed in providing, maintaining, and using various alternative visions for the region. The region's "New Visions" plan, adopted in 1997, stresses public transit and bicycle and pedestrian facilities and movement, and focuses on managing and redesigning existing facilities, services, and ways of doing business, rather than on physically expanding the system. Planners estimate that the land use and demand management actions prescribed in New Visions will dampen the rate of growth in vehicle miles of travel by one-third to one-half when compared with rates experienced in the 1990s.⁷²

But perhaps no U.S. story in planning for sustainable transportation is more celebrated than that of Portland, Oregon. Assisted by the nation's strongest state land use law and a series of reforms initiated before but continued under ISTEA and TEA-21, Portland undertook an exhaustive study of transportation and land use options in the 1990s and embarked on a program of alternatives to sprawl and freeway-building. They have included an urban growth boundary beyond which new development generally may not occur, a light-rail system, and aggressive set of incentives to spur walkable, transit-oriented neighborhoods. Portland's downtown has accommodated 30,000 new jobs in the last two decades without a significant increase in the number of parking spaces or vehicle trips.⁷³

In addition, there has been a 50% increase in public transit trips to downtown, and 43% of all work commuting trips in Portland—many times the national average—are now made on public transit. Air quality is improving.⁷⁴ It may be telling that, despite a comparable rate of population growth in the 1990s, Portland's per capita vehicle traffic was less than two-thirds that of Atlanta; while both regions experienced growth in vehicle miles traveled, Portland's growth rate was less than one-half that of Atlanta from 1992 through 1998.⁷⁵

Federal programs initiated in the 1990s have also funded a host of specific projects helpful to sustainability in communities. The Surface Transportation Program under ISTEA and TEA-21, for example, has funded an access roadway to enable more efficient intermodal freight transfers at the port of Seattle. The law's enhancements program funded an intermodal transportation center in Natchez, Mississippi, that will enable that town's many visitors to leave their cars behind and visit sites on trolleys or buses. And the CMAQ program has led to traffic signal improvements in Denver that have reduced travel times by 15 to 20%, saved nearly 1,800 gallons of fuel per day, and cut CO pollutants by more than two tons per day. CMAQ funds are being used also to help establish passenger rail service on an existing freight line serving metropolitan Chicago and to build a new intermodal freight transfer facility in Auburn, Maine.⁷⁶

Environmental Payoffs

It is inherent in transportation planning and investment, of course, that strategies take a long time to produce benefits. As a nation, we spent some 50 years building the Interstate Highway System, and reversing the impacts we inadvertently set in motion will not happen overnight. But there are some encouraging signs that the new approaches of the last decade are making transportation patterns more sustainable.

In particular, as noted above, the growth in vehicle miles traveled per capita slowed somewhat in the 1990s from what it had been in the 1980s and, in 2000, overall vehicle miles traveled did not grow at all, the first time in 50 years that

69. UNCED, *supra* note 7, at Agenda 21, ¶ 9.15(a).

70. STPP, CHANGING DIRECTION: FEDERAL TRANSPORTATION SPENDING IN THE 1990s (2000).

71. *Transportation Funds Linked to Smart Growth*, NEW URBAN NEWS, July/Aug. 2001, at 1.

72. CAPITAL DISTRICT TRANSPORTATION COMMITTEE, NEW VISIONS FOR THE CAPITAL DISTRICT (1997). See also *Capital District Transportation Committee*, at <http://www.cdctcmo.org>.

73. See discussion and sources cited in BENFIELD ET AL., *supra* note 33, at 45-47 and 152-55.

74. *Id.*

75. CURTIS MOORE, SMART GROWTH AND THE CLEAN AIR ACT 19 (Northeast-Midwest Inst. 2001).

76. See JOE DiSTEFANO & MATTHEW RAIMI, FIVE YEARS OF PROGRESS: 110 COMMUNITIES WHERE ISTEA IS MAKING A DIFFERENCE (STPP 1996); METROPOLITAN TRANSPORTATION COMMISSION, THE NEXT ISTEA: WEAKER OR STRONGER BREW? (1996).

driving did not increase during a period of economic growth. While it is unclear whether the experience of 2000 will become a trend or an anomaly, it is encouraging that a slowing in the growth of traffic has been accompanied by strong growth in the use of public transit. From 1995 through 2000, transit use grew 21% while driving increased by just 11%. This represents a dramatic turnaround from previous decades and even in the early 1990s, when driving grew steadily and transit use plummeted 11.8%.⁷⁷

There has also been improvement in some environmental indicators. Ground-level ozone smog declined 20% between 1980 and 1999. Ozone smog has decreased in 53 metropolitan areas measured by EPA since 1980; although there has been little or no further decrease since 1994, smog pollution has not substantially increased in those areas (as a group) since then. Those metro areas classified as having extreme, severe, or serious smog pollution problems improved 10% from 1995 through 1999.⁷⁸ Particulate emissions have decreased notably in the last decade, following a trend of decreasing emissions since a high point in the 1970s. Emissions of particles smaller than 10 microns in diameter from on-road vehicles decreased from 336,000 short tons in 1990 to 282,000 in 1996 and 257,000 in 1998. Emissions of fine particles smaller than 2.5 microns followed a similar trend.⁷⁹

Continuing Challenges

Most of the data on environmental indicators in the 1990s suggest that the long-range trends noted in the beginning of this Article remain far from overcome, however, and that the work begun in the last decade to reform transportation policy must be intensified if the sustainable future hoped for at the Earth Summit is to be achieved. In particular, emissions of CO₂ from transportation in the United States increased steadily each year between 1991 and 2000.⁸⁰ Petroleum consumption by the transportation sector grew nearly 20% over the decade.⁸¹ NO_x emissions from on-road vehicles, which had decreased in the 1980s, experienced a significant increase in the 1990s.⁸² The steady improvement nationally in ozone smog levels that had been experienced before 1994 has, as noted, come to a halt, with smog no longer decreasing in most metropolitan areas.⁸³

In addition, traffic congestion has continued to increase in U.S. metro areas, although at a slower rate than in the 1980s. Congestion increased 9% from 1992 to 1999 in 68 metropolitan areas tracked by the Texas Transportation Institute, by their estimate wasting 6.8 billion gallons of fuel in 1999.⁸⁴ The STPP, observing that American women, especially mothers, have become “the bus drivers of the 1990s,” reports that women now drive an average of 29 miles per day, spending more time in their cars than the average American spends in conversation.⁸⁵

Moreover, there is plenty of evidence that old transportation spending habits are returning in many places. STPP has found that, although there was a shift in funding toward sustainable practices in the 1990s as a whole, that trend was not maintained in the decade’s last two years, when the portion of funds going to road expansion and new construction increased 21% and the portion going to transportation alternatives other than driving fell by 19%. Less than 7% of “flexible” funding under ISTEA and TEA-21 has been used to pay for new transportation alternatives.⁸⁶

More Sustainable Approaches in Europe and Japan

Experience in other countries offers hope that a strengthened commitment to sustainable practices will produce stronger benefits than we have seen so far. When comparing American cities with those elsewhere, one frequently finds comparable material standards of living, but far less energy efficiency and modal diversity in the transport sector in the United States. In particular, per capita gasoline consumption in American cities is nearly twice as high as in Australian cities, more than four times that of European cities, and over 10 times greater than in such Asian cities as Hong Kong, Singapore, and Tokyo. In many American cities more than 90% of commuters drive to work, compared with 40% in European cities and 15% in Tokyo. Only 10% of total trips in American cities are by bicycle or foot, compared with 40 to 50% in European cities.⁸⁷ In an increasingly competitive global economic system, this inefficiency could well threaten the long-term health of the American economy.

The biggest factor accounting for these differences appears to be not the size of cars or the price of gasoline, but the efficiency and compactness of land use patterns, which has a major effect on average travel distance and the extent to which alternatives to the automobile are viable.⁸⁸ Indeed, northern Europe and Japan have for decades pursued significantly different transportation investment patterns and employed stronger land use controls than in the United States. This has led to more clustered development and more efficient multimodal transportation systems.

Right after World War II, for example, Europe and Japan reinvested in their public transport systems. There were several reasons for this. Unlike in the United States, few citi-

77. Press Release, Surface Transportation Policy Project, Americans Flock to Transit, Ease Up on Gas Pedal (Apr. 1991).

78. U.S. EPA, OFFICE OF AIR QUALITY PLANNING AND STANDARDS, NATIONAL AIR QUALITY AND EMISSION TRENDS REPORT 1999 (2001) (EPA 454/R-01-004).

79. U.S. EPA, OFFICE OF AIR QUALITY PLANNING AND STANDARDS, NATIONAL AIR POLLUTANT EMISSION TRENDS 1990-1998 (2001) (EPA 454/R-00-002) (Table 3-5, Total National Emissions of Directly Emitted Particulate Matter 1940 through 1998).

80. ENERGY INFORMATION ADMIN., OFFICE OF INTEGRATED ANALYSIS AND FORECASTING, U.S. DOE, U.S. CARBON DIOXIDE EMISSIONS FROM ENERGY SOURCES 2000, at EI-81 (2001) (Flash Estimate).

81. ENERGY INFORMATION ADMIN., U.S. DOE, ENERGY INFORMATION ANNUAL ENERGY REVIEW, ENERGY CONSUMPTION BY SECTOR tbl. 2.1e (2000) (Transportation Sector Energy Consumption, 1949-2000).

82. U.S. EPA, OFFICE OF AIR QUALITY PLANNING AND STANDARDS, NATIONAL AIR POLLUTANT EMISSION TRENDS, *supra* note 79.

83. U.S. EPA, OFFICE OF AIR QUALITY PLANNING AND STANDARDS, NATIONAL AIR QUALITY AND EMISSION TRENDS REPORT, *supra* note 78.

84. DAVID SCHRANK & TIM LOMAX, TEXAS TRANSPORTATION INST., THE 2001 URBAN MOBILITY REPORT (2001).

85. STPP, HIGH MILEAGE MOMS (1999).

86. STPP, *supra* note 70.

87. John Pucher, *Urban Travel Behavior as the Outcome of Public Policy: The Example of Modal-Split in Western Europe and North America*, J. AM. PLAN. ASS'N, Aug. 1988, at 510.

88. LESTER BROWN & JODI JACOBSON, WORLDWATCH INST., WORLDWATCH PAPER 77: THE FUTURE OF URBANIZATION: FACING THE ECOLOGICAL AND ECONOMIC CONSTRAINTS (1987).

zens could afford cars in these early post-war years. The scarcity of land that could be made developable by highways, especially in Japan and some of the smaller European countries, provided less political impetus to favor an automobile-oriented development strategy. Although America has now depleted much of its domestic petroleum reserves, western Europe and Japan had no such reserves and thus had good reason to avoid excessive petroleum dependency.

Rising affluence in the 1960s and 1970s led western European countries to shift investment to favor the automobile. However, the attention to environmental and energy issues raised in the 1970s renewed the impetus to preserve modal diversity, a policy choice supported by pressure from citizens, labor unions, environmentalists, and public transport sectors that were better organized, more powerful, and less dominated by the automobile industry than in the United States. Throughout the post-war period, Japan has subsidized the extension of its railways to ever more distant compact suburban areas, while discouraging automobile use through high user charges. As a result, Japan and western Europe approached the 1992 Earth Summit better positioned in terms of transport and land use patterns than the United States to meet the challenges of sustainability.

A traffic policy paper of the League of German Cities (adopted prior to the Earth Summit) notes:

Public mass transit and individual transport, either on foot, by bike, or in a car, must be seen as a holistic system. Each mode needs to be promoted where it offers the greatest advantage in economic, environmental, and social terms. With the help of development policy decisions, building and traffic regulations and associated planning measures, we must help achieve a reduction in transport that is avoidable and shape the unavoidable traffic in a manner that improves the living and environmental conditions of our citizens.⁸⁹

The Netherlands and Denmark provide particularly successful models of a multimodal approach to transportation integrated with sound land use planning. Public transport and bicycle use had fallen dramatically in both countries in the 1950s and 1960s with the building of suburbs and rising investment in roads and automobiles, although even during this period bicycles came into greater use for access to suburban rail and bus stops.

Starting in 1975, it became Dutch national transport policy to devote at least 10% of the surface transportation budget to bicycle facilities as a way to reduce the expenditures for public transportation subsidies and roads, while favoring the environment and urban quality. By the mid-1980s, more than 30% of all trips in the Netherlands were made by bicycle, and 25% of all access trips to railway stations were by bicycle.⁹⁰ Over the past several decades, the Dutch have made major efforts to maintain and expand their efficient and integrated public transport network, which relies heavily on various bus and railway modes.

In the late 1980s, the Dutch Transport Minister announced a bold plan to lower automobile ownership to 3.5 million cars from the current five million, which had been projected to grow to eight million in just two more decades.

With the goal of cutting CO₂ emissions by 8% by the year 2000, the proposed plan included increased taxes on automobile ownership and use along with expanded subsidies for public transportation. Although these plans have since been weakened or slowed, current national policy remains committed to reducing transport sector carbon emissions through strategies including significant pricing and demand management.⁹¹

In Denmark, car owners pay a nearly 200% sales tax when purchasing a car, approximately \$1,000 per year in automobile registration fees, and \$7 per gallon for gasoline. Much of the resulting revenue benefits public and bicycle transport. The city of Copenhagen, for example, installed cycle paths along a large portion of the major arterial roads throughout the city in the late 1970s and 1980s and thus reversed the decline of bicycle use, which now accounts for 30% of all trips in the city. In the 1990s, a new network of higher quality, higher speed, limited access cycle paths was integrated into the city to attract more long trips to bicycle use, as part of the Danish government's pledge to reduce carbon emissions.⁹²

Eleven Steps to a Sustainable Transportation Future

As a nation, there is little question but that we are, in fact, moving toward sustainability in transportation. There have been measurable improvements in process, in mode shifts, and even in some environmental indicators. But, with long-term trends foretelling a dramatically growing population and a growing economy, mere motion toward the goal is not enough, because the goal is itself moving farther and farther away, becoming more difficult to achieve.

In order to achieve the kinds of changes envisioned by the Earth Summit, and to put the United States on a course in transportation that moves more purposefully and effectively toward true sustainability, Congress and the federal agencies must build upon the policy reforms of the 1990s with additional efforts. These efforts can and must begin immediately, but it is important not to think of them as short-term efforts. Achieving sustainability in transportation will require a sustained effort. Such an agenda might include the following ideas discussed below.

Recognize How U.S. Public Policy Has Diminished Our Choices

The first step is simply to recognize more thoroughly that policy does have a substantial impact on travel behavior, rather than to assume passively that travel behavior is innate and must be accommodated by policy. In fact, the travel choices available to most Americans have been sharply curtailed by past policies, from highway subsidies to housing and tax policies to zoning laws, that have made it unattractive or impossible to choose more sustainable options such as walking, cycling, riding transit, living close to our jobs, and driving small, efficient motor vehicles. Moreover, even apart from the considerable influence—intentional or not—of government subsidy and law, this is an area in which the so-called free market does not work. For example, for most of the past century we have failed to reflect the real

89. See Hans Pflaumer, *Traffic Concepts for the City of Tomorrow: A German View*, 68 ITE J. 47 (1988).

90. See MICHAEL REPLOGLÉ, *BICYCLES AND PUBLIC TRANSPORTATION: NEW LINKS TO SUBURBAN TRANSIT MARKETS* (1984).

91. Replogle, *supra* note 4.

92. *Id.*

cost of transportation choices in the prices consumers pay for transportation, vastly diminishing nonautomotive access and increasing our energy use. The experience of other countries, as discussed above, demonstrates that our choices need not be so limited. Recognition of these issues is the first step toward correcting them.

Maintain ISTEA/TEA-21/CAA Reforms

While cleaner vehicle technologies have cut pollution per mile, these have been offset by more miles driven and by a shift to less efficient and more polluting trucks and sport utility vehicles (SUVs). In future reauthorizations, Congress should build upon the reforms of the 1990s that have established a framework for moving toward sustainability, and it should resist pressure to weaken or rework the transportation conformity requirements. It is especially important to allow conformity to operate under the framework of air quality plans that include adopted emission budgets to reach attainment; these have only taken effect during the last year in most seriously polluted regions.

Establish and Work Toward Goals for Energy Conservation and Equity

In future reauthorizations of federal transportation law, Congress should expand eligibility and incentives for federal transportation funds to encourage community-based solutions to traffic and urban livability. This should include requirements that near-term transportation improvement programs (TIPs) and 20-year regional transportation plans (RTPs) assure timely reasonable progress to achieve at least the following sustainability goals:

- Reduce energy consumption and greenhouse gas emissions to meet national, state, and regional goals;

- Provide equal access to jobs, public facilities, and other opportunities without undue time and cost burdens, including for those without cars; and

- Provide a safe walking route to school for every child.

In Atlanta and many other metropolitan areas, the share of regional jobs reachable by those without cars is low and declining because new commercial and housing development has been approved without assuring access for transit users or pedestrians. This raises concerns under the Civil Rights Act about disparate impacts of federally approved transportation plans and programs. Ironically, Atlanta has recently proved that we can do better: during the 1996 Olympics, morning peak traffic was cut 23% by temporarily putting 1,000 more buses into service and promoting alternatives to driving. This not only expanded access to jobs but also cut traffic-related smog to the degree that hospitalizations of children for asthma dropped by 40%, according to research published in the *Journal of the American Medical Association*.⁹³

Integrate Transportation Planning and Project Reviews but Maintain Environmental Safeguards

Our nation adopted a variety of environmental and historic preservation laws and regulations to inform decisionmakers and assure the public's right-to-know about the effect of decisions and alternatives before bulldozers started knocking down people's houses or paving over streams. Today, transportation and resource agencies are striving to coordinate the planning and project review processes better to reduce redundancy and unproductive bureaucratic process. There may be many opportunities, for example, for agencies to review small, low-impact projects more efficiently and quickly. This can free resources for more thorough review of proposals with more substantial environmental consequences, as contemplated by Agenda 21.

Indeed, on larger transportation initiatives, community consensus will come more easily and efficiently with more effective involvement of stakeholders early in a more integrated planning and project review process that examines transportation, air quality, and land use together. Informed participation and better decisions can flow from use of best practice analytic methods to consider secondary, indirect, and cumulative impacts. These should include fuller consideration of alternatives to road capacity expansion in the planning and project development process and identification of strategies that will reduce transportation energy use. This better administrative approach, anticipated by TEA-21's environmental streamlining provision, does not require changes in the statutes.

Recognize "Induced Demand" in Transportation Planning and Management

It is all too tempting for transportation managers and other state and local officials to implement quick-fix road expansions in attempts to solve our congestion, air pollution, and energy problems by eliminating bottlenecks in the system. Indeed, they are frequently under enormous pressure to do so. If this approach worked, however, Atlanta would be a clean-air, delay-free haven; instead it has become a poster child for sprawl, congestion, and smog. Throwing more money into road building will not solve congestion, fuel economy, or air pollution any better than buying bigger pants solves obesity.

We now know that in most cases new and wider roads bring new traffic that soon uses up the added capacity. As the saying goes: "If you build it, they will come." People shift their time-of-day-of-travel, where they live and work, which shops they go to, and how they travel in response to changes in travel time and cost. Alleviating road bottlenecks without changing how we provide, manage, and price transportation choices and incentives will just leave us stuck in bigger traffic jams down the road, with more sprawl, energy use, and air pollution.

Although better practice methods that account for induced demand are readily available, many regional, state, and local agencies have resisted their adoption, preferring to use obsolete analytic methods as they compare various project and plan alternatives and seek to meet federal planning requirements. At the federal level, the DOT and EPA have failed to press for timely improvement in analytic methods, accepting as standard practice methods that are insensitive

93. Michael S. Friedman et al., *Impact of Changes in Transportation and Commuting Behaviors During the 1996 Summer Olympic Games in Atlanta on Air Quality and Childhood Asthma*, JAMA, Feb. 21, 2001, at 897.

to key elements of induced demand, such as time-shifts in travel. This often leads to major errors in estimating the air-pollution, energy-consumption, and congestion-related impacts of projects and plans. The DOT, EPA, and Congress should support timely adoption of best practice planning and project analysis methods.

Make Commuter Choice a Typical U.S. Workplace Benefit

For most Americans, a free parking space at work has been the sole available commuter benefit, because of long-standing federal tax code preferences. But recent tax reforms are expanding commuter choice. Employers can offer their employees tax-free transit and vanpool benefits of up to \$100 a month starting in 2001, as well as taxable cash-in-lieu-of-parking benefits. Allowing employees to buy transit passes with pre-tax dollars saves the typical transit commuter over \$400 a year and saves their employer money as well. When federal agency employees in the Washington, D.C., metro area received employer-paid transit benefits starting in 2000, 11% of those who used to drive to work switched to transit, taking 12,500 cars off the region's crowded roads every workday. At firms in California and Minnesota, a two- to three-dollar-a-day incentive in lieu of free parking has helped motivate one out of eight who used to drive to find other ways to get to work.⁹⁴ Such benefits help employers attract and retain employees and especially help low- and moderate-wage workers who spend a large share of their incomes commuting and often ride transit to work.

Congress should respond to Agenda 21's admonishment to place more emphasis on less polluting transportation modes by spurring more widespread adoption of these benefits. It should provide fully equal tax treatment for parking and transit benefits and give bicycle commuters the same financial incentives as transit users. It should copy the tax credits recently adopted by Maryland, Minnesota, Oregon, and Washington to provide incentives to employers for the cost of providing transit benefits to their employees. Cutting morning commute traffic by 5 to 10% in rural and outer suburban areas and by 10 to 20% in major urban centers—ambitious but reachable goals—would speed traffic, boost access to jobs for low- and moderate-income workers, and reduce gasoline use enough to avoid any short-term price spikes caused by limited refinery capacity, while also helping the country reduce dependence on imported oil.

Encourage Road-Pricing Mechanisms Without Toll Booths

As noted above, Agenda 21 calls for more use of market-based mechanisms. For transportation, another promising option for cutting excessive vehicle use is greater use of road pricing, assisted by new nonstop electronic toll technology that allows motorists to pay tolls without slowing down. Road pricing can encourage alternative travel choices and also provide additional revenue streams essential to maintain transportation systems, expand choices, and cope with growing travel demand. For example, automated time-of-day tolls can shift highway usage away from peak periods and keep traffic flowing without wasting scarce road capacity. Already, time-of-day tolls help manage con-

gestion and expand choices in the metropolitan New York/New Jersey region, with discounts for electronic toll payers who avoid rush hours and premium tolls for peak drivers.⁹⁵ Another innovative application is High Occupancy Toll (HOT) lanes, which allow solo drivers to pay to use high occupancy vehicle lanes while giving a free ride to buses, vans, and sometimes carpools.⁹⁶

Congress should encourage states and transportation facility operators to replace annoying toll booths that cause congestion and waste gasoline with new customer-friendly tolling systems using toll transponders and image processing and billing systems, as on Toronto's Electronic Toll Road.⁹⁷ Congress should encourage states to issue toll transponders with vehicle registrations, and eliminate restrictions on tolling highways that were constructed with federal aid, which can now only be tolled under limited pilot projects authorized by TEA-21.

HOT lanes have been controversial because they tend to favor those with the resources to pay to use them. This is a legitimate concern, and one way to mitigate inequitable impacts is to direct HOT-lane revenues explicitly to applications that benefit low-income citizens. If HOT-lane revenues fund new transit, for example, as on San Diego's Interstate-15 HOT lane, everyone wins. And the environmental benefits can be substantial: on California's Route 91, diversion of traffic onto HOT lanes has reduced congestion on the entire road and increased the number of passengers per car to 1.6, compared to a previous average of 1.2 per car.⁹⁸

Encourage Use-Based Car Insurance

Another promising market-based mechanism is so-called pay-as-you-drive automobile insurance. Current policies are based on fixed-rate categories that typically charge very high rates per mile to those who drive little, while offering low rates per mile for those who drive significantly more than the average. This hurts those who live in cities and the poor, who effectively subsidize high-mileage suburban drivers. In August 1998, Progressive Insurance inaugurated a project in Texas assisted by global positioning system (GPS) equipment to charge drivers for insurance according to where, when, and how much they drive, rather than on a fixed price. Drivers who use their cars less pay less for insurance. Similar use-based car insurance may soon be introduced elsewhere using the GPS equipment that is now factory-installed on many cars. EPA is studying the concept under its "Project XL," which is intended to spur innovative solutions to environmental problems.⁹⁹

94. Donald C. Shoup, *Evaluating the Effects of Cashing Out Employer-Paid Parking: Eight Case Studies*, TRANSPORT POL'Y, Oct. 1997, at 201-16.

95. See Wayne Arnold, *Relief for Rush Hour: Pay as You Go*, N.Y. TIMES, Aug. 9, 2001, at F6; Jane Gross, *Electronic Tolls Are Catching On, and Commuters Are Catching Up*, N.Y. TIMES, Mar. 25, 1997, at B1.

96. See, e.g., ITE Task Force on High-Occupancy/Toll (HOT) Lanes, *High-Occupancy/Toll (HOT) Lanes and Value Pricing: A Preliminary Assessment*, 68 ITE J. 6 (1998).

97. See *Toronto 'Pike All Electronic*, TOLL ROADS NEWSL., Apr. 1996, at 7.

98. See, e.g., Donald Shoup & Jeffrey Brown, *Pricing Our Way Out of Traffic Congestion: Parking Cash Out and HOT Lanes*, in ANDERSON BUSINESS FORECAST AND UCLA SCHOOL OF PUBLIC POLICY AND SOCIAL RESEARCH, CALIFORNIA POLICY OPTIONS (1998).

99. See, e.g., U.S. EPA, *Remarks of Christie Whitman, Administrator of the U.S. Environmental Protection Agency, at the National Environmental Policy Institute*, at http://www.epa.gov/projectxl/whitman_03_08_01.htm (last visited Jan. 25, 2002).

The same GPS-cellular communications equipment that would facilitate use-based car insurance also supports other energy-conserving and safety services. One particularly useful application is identifying the precise location of emergencies, including those where injured drivers and passengers are unable to talk. Especially when coupled with automatic 911 calls when an airbag is deployed, this facilitates rapid response to save lives and clear accidents off congested roads quickly, which in turn saves fuel lost in traffic incident delays. Congress should require motor vehicle manufacturers to install low-cost (roughly \$100 a unit) GPS-cellular equipment as a standard feature in all new cars. This would enable tens of millions of motorists to save hundreds of dollars a year on car insurance, reduce gasoline use and traffic, and save lives, fuel, and time.¹⁰⁰

Improve and Expand Pedestrian and Bicycle Facilities

Many transportation agencies have greatly boosted bicycle and pedestrian facility improvements in the past decade, following more than half of a century in which pedestrians and bicycles were pushed aside by automobile-oriented policies. Replacing short car trips with walking and bicycling is a particularly useful way to help achieve the sustainability goals of saving gasoline and reducing emissions per mile, because the fuel efficiency and emissions performance of the repeated engine starts and post-trip cool-downs associated with short trips is very poor.¹⁰¹ Projects that restore or improve walking and biking connections between neighborhoods and to schools can also reduce chauffeuring by parents; today, lack of sidewalks and safe intersection crossings effectively prevents many children from traveling on their own power instead of spending up to several hours a day in parents' cars or riding school buses.¹⁰²

Traffic calming on local streets, with narrowed streets at intersections, raised sidewalks, and other measures designed to slow motor vehicles, is frequently all that is needed to restore walkability to a neighborhood. Traffic calming alone has been shown to reduce gasoline use by 12% in some circumstances. In addition, such measures as secure, guarded bicycle parking at transit stations, as now found in California, Colorado, Oregon, Pennsylvania, and Washington, can greatly boost the area served by transit at far less cost than

park-and-ride lots. Bike-and-ride trips reduce automobile use far more than park-and-ride measures.¹⁰³

The United States should strive to achieve a much greater share of trips taken by bicycle or on foot, as is the norm in many European countries. To encourage communities to seize opportunities to adopt such sustainable-transportation measures, Congress should eliminate the local funding match requirements for pedestrian and bicycle planning and improvements. Congress should also provide priority access to TEA-21 funds in the surface transportation and CMAQ programs for such improvements by local units of government, transportation service providers, school districts, and community development corporations, with simplified project review and contracting procedures for small- and low-impact projects.

Expand Incentives for Affordable Housing Near Jobs and Transit

There is a growing consensus among land development and real estate experts that some of the best emerging opportunities for market-responsive growth of new housing and employment are located in existing communities, including urban and inner suburban areas that have been in decline in recent decades. Atlanta, Georgia; Trenton, New Jersey; and Portland, Oregon, for example, are all taking steps toward renewal of brownfields and older neighborhoods.¹⁰⁴

Encouraging housing growth in older neighborhoods close to the center, rather than at the edges of metropolitan regions, has been shown in many studies to be one of the most effective strategies for reducing regional traffic growth and related pollution. Research in Toronto shows that, since 1976, for each 100 additional dwelling units in the central area of the city, there has been a reduction of about 120 inbound vehicle trips during the morning three-hour rush period. Increased housing density within central areas can often be accommodated within existing development patterns through conversion of abandoned dwelling units and warehouses to apartments and the conversion of underused basements, carriage houses, and garages in single-family homes to rental units.

Rental units in private homes, for example, constitute one of the most cost-effective ways to create affordable housing and to strengthen older urban neighborhoods where average household sizes have fallen dramatically in recent decades due to demographic changes. In addition, location-efficient mortgages that reward homebuyers who save transportation expenses by locating near transit are now available in a growing number of housing markets and provide an additional measure that can help reduce traffic growth and related energy use. Experience in Denver, Portland, and Vancouver, among other cities, shows that increasing housing density through incremental neighborhood measures can reduce regional traffic and energy use while spurring lively downtowns that attract business, residents, visitors, and new investment.

100. TODD LITMAN, DISTANCE-BASED VEHICLE INSURANCE AS A TDM STRATEGY (2001).

101.

More than half of some emissions (particularly VOCs) occur during cold-start and hot soak conditions, and so are mainly affected by the number of vehicle trips that occur, not mileage. For example, a 20-mile trip produces only 35% more emissions than a 10-mile trip." Reductions in the number of short trips can provide relatively large pollution emission reductions. For example, shifting 5% of automobile trips to bicycling and walking might reduce total automobile mileage by just 1-2% (since these are short trips), but it might reduce pollution emissions costs by 3-6%, due to the relatively high emission rates of the vehicle mileage foregone.

Victoria Transportation Policy Inst., *Energy Conservation and Emission Reduction Strategies*, in TDM ENCYCLOPEDIA (updated November 2001), available at <http://www.vtpi.org/tdm/tdm59.htm>.

102. STPP, *supra* note 85. See also BENFIELD ET AL., *supra* note 33, at 42-43.

103. MICHAEL REPLOGLE & HARRIET PARCELLS, LINKING BICYCLE/PEDESTRIAN FACILITIES WITH TRANSIT, NATIONAL BICYCLE AND WALKING STUDY, CASE STUDY No. 9 (FHWA-PD-93-012) (1992).

104. See, e.g., U.S. EPA, OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, BROWNFIELDS SHOWCASE COMMUNITIES (2000) (EPA 500-F-00-240), available at <http://www.epa.gov/brownfields>; F. KAID BENFIELD ET AL., SOLVING SPRAWL: MODELS OF SMART GROWTH IN COMMUNITIES ACROSS AMERICA (NRDC 2001).

To address the sustainability goal of planning transportation and land use together, Congress should strengthen incentives and requirements for regional transportation plans and major project reviews to consider how zoning, permitting, building, parking, and site-design codes affect the availability of housing (particularly affordable housing) close to job centers, along with related transportation demand and its impacts. Such incentives and requirements should encourage identification of how changes to various land use and community design codes might better meet regional transportation, air pollution, and energy goals. Congress should provide expanded eligibility for priority access to TEA-21 and other funds for community development corporations and local governments to fund technical assistance to homeowners or landlords who are considering creating an accessory unit, along with marketing, loan guarantees, and interest subsidy programs.

Improve Motor Vehicle Fuel Economy With Stronger Corporate Average Fuel Economy (CAFE) Standards

Finally, although the emphasis in this Article has been on planning and investment issues rather than vehicle technology, we cannot overlook the fact that one-half of U.S. vehicle sales consist of gas-guzzling SUVs, large minivans, and personal trucks. In Europe, small, fuel-efficient, easy-to-park, often-luxurious city cars are now all the rage. American gasoline taxes are a small fraction of those in other countries, encouraging us to drive more and fueling our preference for gas-guzzlers. An increase in the Corporate Average

Fuel Economy Standards would encourage carmakers to employ higher efficiency technologies to improve motor vehicle fuel economy. As a first step, Congress should make fuel efficiency standards for light-duty trucks (a category that includes minivans and SUVs) equal to that for cars, cutting our nation's dependence on imported oil and helping consumers save money.

The Path Ahead

As we noted earlier in this Article, achieving true sustainability in transportation will not come easily or quickly. The goals of Agenda 21 and the Earth Summit are especially difficult to achieve in the American transportation context, where sprawl, high rates of driving, and large personal vehicles prevail, and where decisionmaking for transportation has traditionally been dispersed among so many state and local jurisdictions. But it is our view that, increasingly, Americans are ready to take the necessary steps. Americans want more transportation choices. Americans want alternatives to sprawl that can make their lives more convenient. Where innovative measures have been applied, they have proven immensely popular.

In large part, the legal framework to support sustainable transportation has been put into place at the federal level in ISTEA, TEA-21, and the CAA. The framework should now be strengthened and filled in with strong implementation, oversight, and complementary incentives. States and localities should follow suit, as some already have. We have begun to change, but we must continue.