

TRANSPORTATION RESEARCH BOARD STRATEGIC PLAN January 2002

This updated Strategic Plan of the Transportation Research Board (TRB), approved by the TRB Executive Committee on January 16, 2002, is organized into the following five sections: (I.) Mission and Goals; (II.) Action Plan; (III.) Performance Assessment; (IV.) Gap Analysis; and (V.) Environmental Scan.

I. MISSION and GOALS

TRB Mission: *Promoting Innovation and Progress in Transportation through Research*

The mission of the Transportation Research Board is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, the Board facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation.

Goals

1. To maintain and enhance TRB's role in fostering and contributing significantly to the research, development, and implementation of new transportation technologies and innovative practices in the United States.
2. To strengthen TRB's activities in the non-highway modes and promote greater participation by private-sector transportation organizations, while maintaining its historic roles in contributing to improved highway transportation and supporting public-sector transportation agencies.
3. To increase TRB's contribution to decision making on national transportation policy issues, with special emphasis on cross-cutting issues, modal/multimodal/intermodal areas beyond its more traditional scope, and the influence of transportation on other issues and aspects of society.
4. To contribute significantly to improved communication and public awareness of issues in transportation and more extensive dissemination of research findings, including the dissemination of foreign research results in this country and the dissemination of U.S. research findings both here and abroad.

II. ACTION PLAN

This section of the Plan focuses on actions that should be taken to address the gaps, limitations, challenges, threats, and opportunities that have been identified as part of the

strategic planning process (see Sections III and IV, below). The list is organized into three groups: items for follow-up by the Executive Committee; items referred for action to the Division A Council; and items for follow-up by the Executive Director/staff.

Items for Follow-up by TRB Executive Committee

Each of these four major, cross-cutting items requires additional consideration and disposition by the Executive Committee. As part of this consideration, the Committee should take a comprehensive look at its structure and subcommittees, in order to ensure that appropriate mechanisms are in place to undertake these efforts.

- **Develop a “big issues in transportation” study series.** From time to time, the Executive Committee identifies topics for “self-initiated” studies, studies on important issues that are unlikely to be requested by government agencies. Among possible reasons for this, the issue may be too sensitive for an agency to address, no single agency may have clear responsibility, or the issue may be a long-term one. Transportation security is a timely example of such a critical, cross-cutting subject. Although TRB nearly always has one or two self-initiated studies on its agenda, the Executive Committee has never attempted to put together a comprehensive agenda of such topics. The new list of *Critical Issues in Transportation* could be the foundation for such an exercise, which might stimulate additional policy studies at TRB or elsewhere. In addition, having such an agenda could assist in fundraising efforts with foundations and other sponsors.
- **Convene a research leadership roundtable.** Taking a comprehensive, top-down view of transportation research that cuts across modes and organizations and includes federal, state, university, and private-sector programs has never been attempted, at least not in recent memory. Efforts aimed at coordinating just the federal programs have had at best modest impacts. Nonetheless, such a review might point out neglected opportunities, unnecessary duplication, gaps, and misdirected resources. As an important first step, a research roundtable composed of top leaders from all modes could hold periodic discussions on both the challenges of greater coordination and the opportunities. Roundtable discussions might directly stimulate reforms and better coordination. The Executive Committee should examine the need for such a roundtable and how it might be organized. Possibly, the Executive Committee itself could take this on as an added assignment.
- **Assess opportunities for expanded international activities.** With the developed world, there are opportunities to share transportation technology, pursue research cooperatively, and speed the transfer of knowledge on common transportation problems. In the developing world, U.S. technology and methods have many potential applications. TRB is well positioned to support such international initiatives. It has sizable international participation at its Annual Meeting and is widely recognized among transportation professionals throughout the world. The Executive Committee should review current activities and international connections, assess the need for expanded or redirected international activities, assess sponsor interest, and develop new initiatives as appropriate.

- **Place greater emphasis on assembling and disseminating material on the value of transportation research and its successes.** For many new officials, the need for transportation research, particularly in the public sector, is not immediately obvious. Moreover, demonstrating that the gains from research are worthwhile can be difficult, especially for long-term research that is not associated with immediate applications. TRB's "Research Pays Off" series in *TR News* addresses this issue, but its impact is modest and falls short of producing the kind of evidence needed to justify significant research investments. The Executive Committee should assess what the need really is, what sorts of information should be assembled and disseminated, and what expanded role, if any, TRB should play.

Items Referred for Action to Division A Council

These items, which focus on activities centered in the Technical Activities Division, are referred to the Division A Council for consideration and action.

- **Develop and implement strategies aimed to position TRB standing committees to be at the forefront of emerging issues.**
To complement the deliberate 'bottom-up' approach in which TRB standing committees are formed over time, a 'top-down' approach should be added to help assure that TRB is positioned to address issues as they are emerging, rather than years later. (Emerging issues for which we have no standing committee "home" currently include transportation security, performance measures, context-sensitive design, and multi-modal systems approaches to addressing congestion and safety.) A top-down review of standing committees should be undertaken by Division A Council to ensure that our mix of committees matches up well with today's issues.
- **Develop strategies to respond to the integration of transportation into the logistics process.**
This integration makes it harder for TRB to relate to the shipper community, as the focus is on logistics not just transportation. Are there actions that TRB can take to accommodate this trend? Division A Council should review the scopes of existing freight-related committees and determine if they should be adjusted. The Council should also consider if special outreach efforts should be undertaken to gain greater involvement by shippers.
- **Conduct more state-of-the-art/practice conferences, seminars, and workshops.**
TRB could potentially extend its contribution to transportation practice by giving greater emphasis to state-of-the-art/practice in its convening activities. These could be held as stand-alone activities or piggybacked onto the Annual Meeting or regional meetings and might be especially attractive to young professionals who would not otherwise attend TRB activities. Illustrative areas include environmental assessment, travel demand forecasting, and context-sensitive design.
- **Consider instituting new types of regular summer committee meetings, such as an environment-oriented committees' mid-year meeting and a freight logistics summer meeting.**

There has been a trend of conducting specially focused joint summer meetings by related groups of standing committees. Division A Council should consider if there would be a benefit to establishing some of these as regularly recurring events, which might also provide opportunities to forge strategic partnerships with other organizations. For example, a freight logistics summer meeting could perhaps be tagged to the ports and waterways midyear meeting; there is also a possibility that it could be developed through strategic partnerships with organizations such as the Intermodal Association of North America and the American Association of Port Authorities.

- **Take steps to effect more aggressive and visible treatment of high-technology transportation applications throughout TRB's core programs.**
Although "high-tech" emphasis areas are scattered throughout the Division A committees, the Board has typically not set up committees specifically focused on these areas. Division A Council should consider whether it would be advisable to rename or repackage some existing committees or to pursue other means to give enhanced emphasis to high-tech areas, such as telecommunications and electronic communication technologies, which have increasing importance for transportation. This could also counteract the lingering impression that TRB is "low-tech."
- **Consider additional measures to improve the stature of TRB's peer review process.**
More than half the papers submitted to TRB come from the academic community. Improvements to the peer review process have been made in the past to help preserve this important flow of information. Division A Council may need to consider additional steps to more fully satisfy the peer review requirements for academic tenure.
- **Define suitable next steps to build on the presence of the Marine Board.**
The opportunity to integrate TRB's marine and intermodal committees with the Marine Board has not been fully realized, and there are related opportunities for strengthening outreach to new or less well established constituencies. Division A Council should consider ways to accomplish these objectives, including working with ports and with the commercial and military marine communities.

Items for Follow-up by TRB Executive Director and Staff

These items require follow-up by the Executive Director and/or staff at his direction.

- **Issue a research electronic letter.**
This should build on an initial e-letter, already in circulation, that is limited strictly to TRB news items. The new effort could be regular or episodic, and would report (via e-mail) on research-related news and what's going on in Washington relating to research.
- **Undertake more aggressive marketing of TRB.** The emphasis of this effort should be on expanding awareness of TRB and its programs, and on distinguishing it from other professional and research organizations. The goal would not necessarily be to increase funding or sponsors, although it could do that.

- **Foster strategic partnerships with industry and professional groups.**
Many organizations are entering into such partnerships, to effect a closer relationship in connection with specific meetings, committees, or publications. In this connection, the Executive Director and staff should explore the following questions: (1) Should TRB formalize partnerships with its existing sponsors? (2) Should it seek (non-monetary) relationships with organizations that have overlapping interests and that are not sponsors, such as the Airports Council International, National Association of State Aviation Officials, Association of Metropolitan Planning Organizations?
- **Strengthen relationships with other constituencies.**
A number of steps could be considered to strengthen TRB's relationships with universities, transit properties, and local jurisdictions. More frequent and formal communications with university and transit representatives through the electronic newsletter would be a logical first step. An effort could be undertaken to attract more local-government entities as TRB sponsors or affiliates by tailoring these categories and customizing communications and services provided to meet their needs. The Executive Director and staff should examine these options and implement as appropriate.
- **Improve and expedite the reporting of research results to practitioners.**
State DOT sponsors are more interested in expeditiously receiving practical information and tools generated from research than they are in waiting until reports are processed through peer reviews and other steps. In addition, they generally prefer short reports that focus on the practical results of a research effort rather than on the research design/methods. TRB should explore ways to generate these practical results and disseminate them quickly to practitioners, while the full research report goes through a more thorough peer review and publication process.
- **Provide electronic notification and dissemination of TRB reports.**
- **Assist in development of additional cooperative research programs.**
There are opportunities for cooperative research in a variety of areas; and these programs have a symbiotic relationship with other TRB activities, especially in constituency-building. In addition to the Congressionally requested study of an aviation cooperative research program, there is interest in developing an environmental program. Staff should provide information and guidance upon request.

III. PERFORMANCE ASSESSMENT

Strengths, Limitations, Challenges and Threats, Opportunities

TRB is an 80-year-old independent, nonprofit U.S. institution that serves as a clearinghouse for transportation research and technical information, a neutral forum for research-related meetings and activities, a manager of contract research programs in highways and public transit, and a source of balanced studies authored by expert committees on national transportation policy issues.

A. STRENGTHS

A well established constituency that is both broad and deep.

- Historic and continuing ties to the U.S. highway community and the state highway and transportation agencies.
- A broad sponsorship base including current sponsorship by most of the modal and other component administrations within the U.S. Department of Transportation.
- Participation, although uneven, by all modes of transportation in TRB activity
- A volunteer network of more than 4,000 transportation experts who serve on a diverse array of TRB technical committees and panels and participate in a wide range of TRB activities.
- A "bottom-up," grass roots structure of about 180 standing technical committees that attract very broad participation of the transportation community--from students to top-level administrators of transportation organizations.

Linkage to the National Research Council/National Academies of Sciences and Engineering/Institute of Medicine, providing institutional credibility and resources.

- The stature of the National Academies is vitally important in attracting talented individuals to serve and in drawing public attention to programs and products.
- The National Research Council (NRC) processes governing committee appointments and report review ensure that policy studies and other projects on major transportation issues are conducted objectively by balanced committees of experts who serve without compensation.

A longstanding reputation for credibility, objectivity, and neutrality.

- These traits make TRB attractive as an institution to conduct policy studies on national transportation policy issues, and to convene conferences and other meetings of parties with differing perspectives on technical or policy issues.

A broad array of programs, services, and products, including some that are preeminent or unique.

- TRB's Annual Meeting is the single largest gathering of its kind, currently drawing approximately 8,500 attendees to exchange research results and information on all aspects of transportation.

- The *Transportation Research Record: the Journal of the TRB* series provides a compendium of peer-reviewed technical papers grouped by subject matter, drawn largely from Annual Meeting presentations.
- The Cooperative Research Programs are customer-oriented programs of contract research, in which the customers (state transportation agencies for NCHRP and transit operators for TCRP) select problems for pool-funded research, conducted with the guidance of small panels of volunteer experts.
- The Transportation Research Information Services (TRIS)--an extensive computerized bibliographic database that is now available without charge on the Web through the Bureau of Transportation Statistics' National Transportation Library Web site.
- Policy studies on national transportation issues, conducted according to the NRC study process described above.

A diverse, experienced, dedicated staff.

- Staff includes a broad variety of specialists well recognized in their fields.
- Staff members have longstanding expertise in organizing and facilitating the work of the volunteer committees.

A whole that is greater than the sum of its parts.

- The interactive, cross-fertilizing nature of the various aspects of TRB results in an organization that is stronger and more influential than all its parts.
- TRB is a unifying force, by virtue of its ability to bring all parties to the table and look at the nation's transportation system as a whole.

B. LIMITATIONS

Uneven participation by transportation groups and constituencies.

- Ties to government and universities traditionally have been stronger than ties to the private sector. Example: very limited representation of shippers.
- Gaps even within the public sector. Example: some environmental advocacy organizations and transportation agency environmental experts represented, but few public environmental agencies below the national level.

- Stronger representation of some disciplines and fields than others (e.g., weak representation in areas of vehicles/fuels, international/trade issues, logistics).
- Perception that TRB is not "balanced" can affect credibility and willingness of some individuals and groups to actively participate in TRB activities.

An organizational structure and institutional ties that limit TRB's flexibility and ability to change, and may result in higher costs for some activities in comparison with other types of organizations.

- Bottom-up standing committee structure tends to reinforce the status quo, or at least make change very slow.
- NRC/NAS policies and procedures limit TRB's flexibility and the speed with which it can initiate new programs, services, or projects. Examples: NRC attitude toward additional cooperative research programs has vacillated back and forth over time; NRC requirements have constrained TRB's Web presence.
- The structure of the Board's financial support gives TRB limited scope to initiate new programs, projects, or services within existing budgets.
- TRB's indirect cost rates, set by its parent institution, are perceived as high.

Limited ability to respond quickly to requests for policy and technical advice.

- Mechanisms for providing policy advice are perceived as slow and costly. A typical policy study costs around \$500,000 and requires about two years to complete, to provide the necessary time for a specially appointed expert committee to engage in the deliberative process that is the hallmark of NRC studies. Other constraints include internal oversight processes (NRC project and committee approval and report review procedures), designed to ensure the integrity and credibility of studies; and the Federal Advisory Committee Act Amendments (projects involving NRC committees that provide recommendations or advice to the government are subject to procedures intended to ensure public access in the information-gathering phases). Nonetheless, the opportunity does exist to conduct a small number of "fast-track" (6- to 10-month) studies at any given time, and TRB has successfully conducted a number of these projects, which place unusual demands on volunteers and staff.
- The CRP project panel process, while praised for its strong involvement of the "users" of the research, increases the time necessary to develop and deliver research findings.
- The traditional emphasis of the Annual Meeting on paper sessions, which require a substantial lead time for paper preparation, reduces the ability of this event to focus on issues of the most current interest to the transportation community.

Methods of distributing research results and other information that are not targeted as effectively as they could be to the relevant constituencies.

- For an organization that is a clearinghouse for research information and that issues more than 100 publications annually, "getting the word out" to those who need it is critical. Current methods of dissemination are judged by some to be ineffectively targeted, and changes in format for the delivery of some products could improve their accessibility.

Continuing perception of TRB as primarily a highway-oriented organization.

- Despite the Board's extensive involvement in, and outreach to, other modes of transportation, its origins and long history of serving the highway community still affect its image.

C. CHALLENGES AND THREATS

Possible Loss of Relevance

- The principal threat TRB faces is reduced relevancy. As long as it remains relevant to the needs of its sponsors and constituencies, it is likely to enjoy their participation and support. This goes to the heart of the strategic planning process and is obviously linked to a number of different points in this analysis. In order to remain relevant to sponsors and constituents, the Board must focus on providing programs and services that are considered highly useful by customers and sponsors (especially programs and services that it is uniquely well suited to provide). TRB should proactively adjust its programs and emphasis areas to stay in tune with the needs and concerns of its sponsors and constituents, and it probably should avoid diversifying its offerings to the point of "trying to be all things to all people."
- The diversity of TRB's work and its constituencies results in tensions between different aspects of its mission--i.e., technical versus policy work--and raises different expectations of where TRB should and will put its emphasis. Although some tension is inevitable, TRB needs to determine how it might best respond to, or mediate, these potential conflicts at a time when expectations of transportation's role in society are changing.

Potential delays, disruptions, and cutbacks in funding by major sponsors.

- Given TRB's dependence on a large number of mostly public-sector sponsors, the continuing support and timing of the support from one or more of these public agencies is often in doubt.

- TRB's financial health is tied to a large extent to public-sector interest in and support of transportation research generally. Public-sector support for research has been relatively strong in recent years. However, the last legislative reauthorization cycle was marked by a lack of growth in federal funding for transportation research, coupled with increased Congressional earmarking under TEA-21 and subsequent appropriations bills. If the resulting trend of declining federal discretionary dollars for transportation research continues, it could affect the level of support for the Board's core programs, policy studies, and/or other activities.
- For core support and NCHRP, TRB is particularly dependent on state funds, which originate from the State Planning & Research (SPR) provisions of Federal-Aid programs for highways--the status of which may be revised in the post-TEA-21 authorizing legislation. The long-term status of TCRP is also uncertain; that program has been funded at a level that has not grown over the last several years, and earmarking in the annual appropriations process has reduced available funding.
- Organizational changes, both in public- and private-sector organizations, could increase uncertainty about the overall level of financial support for TRB by these groups.

Competition

- A variety of professional organizations, university research centers, special-purpose organizations, foundations, and others offer services similar to some of TRB's services. While generally healthy--reflecting a broader scope, increased resources, and new participants in transportation research--it can mean duplication of activities and increased competition for scarce dollars and volunteers' time.

Technological Obsolescence

- In an era of rapid developments in information technologies, failure to respond quickly enough to the new opportunities in electronic communication and dissemination of information could result in technological obsolescence.

D. OPPORTUNITIES

Continuing, and possibly growing, demand for the types of services TRB provides.

- This period is proving to be a complex, transitional era in transportation, in which there is a continuing need for the types of services TRB provides--information dissemination and supporting research, inclusive forums for policy debate, credible institutions for conduct of special studies and policy debate.

- In an era of globalization and increasingly international contacts and cooperation, opportunities and interest exist for TRB to undertake increased outreach to the transportation community, in the United States and also abroad, including technical advice and information resources.
- There is continuing interest in extending the Cooperative Research Program model to a variety of areas with limited research capability of their own—for example, locally provided service such as airports, or multi-stakeholder issues, such as the environment or motor carrier safety.

New information technologies that could improve TRB's delivery of products and services.

- Application of new information technologies, including CD-ROM, videoconferencing, and Internet, could lead to faster, less expensive, and more customer-oriented ways of delivering TRB products and services. The Board has made a good start down this road, but the pace of change is swift and the level of user expectations high. (See "threat" side of this above.)

Opportunities to expand TRB's constituencies and financial support.

- There may be an opportunity to broaden TRB's constituencies and financial support, in particular by attracting additional private-sector participation, to the extent that this is consistent with TRB's overall mission. TRB recently revised the financial thresholds for sponsorship and sustaining affiliate status, and introduced changes in the benefits provided to affiliates, after a long period in which there had been no increase in the level of contributions required for these categories. It is too soon to assess the full effects of these changes on the Board's base of constituencies and support.

Potential to capitalize on TRB's talent pool to identify new, cutting-edge opportunities for intellectual investigation.

- TRB should tap its pool of talented volunteer experts to seek out new intellectual opportunities, such as the possible interaction of the developing advanced transportation infrastructure with the national information infrastructure (NII).

IV. GAP ANALYSIS

One of the key objectives of the strategic planning process is, through the assessment of TRB's performance including input of the various stakeholder groups, to identify major gaps that need to be addressed in order to fulfill TRB's mission. 'Gaps' may be identified in any or all of the areas that define the Board--its products and services, constituencies, participants, disciplines, subject areas, methods, and processes. A 'gap' can be defined as an

area in which improvement or expansion is needed in order to enhance, or even to maintain, the relevance and usefulness of TRB to its sponsors and to the broader transportation community, or to attract new sponsors and audiences.

Another way of approaching this is to ask, Which groups should be involved in TRB that are not currently engaged? What disciplines, subject areas, and issue perspectives are missing or under-represented in the TRB portfolio? And what changes should be made to the existing array of services and products that the Board provides and/or to the means by which those services and products are marketed and delivered?

Groups that have been historically difficult for TRB to attract and to engage include shippers, private-sector suppliers and contractors, non-transportation agencies at the local and state levels (such as state environmental organizations), aviation-related organizations, and elected officials. The issue for some of these groups is that they do not perceive transportation—or research—to be centrally important to their mission. This can also be said of some of the federal agencies that have been more peripherally involved in TRB in the past. There appears to be a recent trend toward greater involvement of the non-DOT federal agencies—EPA, NASA, and DOE are all currently TRB sponsors. Involvement by DOD may also be improving, partly as a result of the Board's increased involvement with maritime and freight issues following the incorporation of the Marine Board into TRB. Strategies for collaborative involvement on individual projects may be a good entrée for some of the federal non-DOT agencies not currently engaged.

Also missing are certain disciplines, subject areas, and issue perspectives. Those interested in motor vehicle design, for example, are likely to go to the Society of Automotive Engineers rather than to TRB, and it would probably not be productive for the Board to try to attract that group with a well-established organization representing its interests and expertise. With the growing integration of transportation and logistics, however, it may make sense for TRB to try to engage the logistics industry and its associated research community more fully. More systematic outreach to existing organizations such as the Council of Logistics Management could be an important first step. Design of a specific activity or series of activities targeted to this subject area and community might also be helpful. Similar efforts may be needed in the areas of telecommunications and electronic communications, as the relationship between these areas and transportation continues to evolve.

Another area that could benefit from greater attention is the international community interested in transportation. International participation in the Annual Meeting and other activities is substantial and growing; but it may be possible to enhance TRB's international presence through a more systematic approach, including some strategic partnering or collaboration (an example is the collaboration with OECD on planning for a conference on value pricing). Benefits to sponsors could be stressed, in terms of the growing recognition that we can learn from the experience of other nations in addressing transportation-related problems. Increasing the diversity of individuals serving on TRB committees and participating in conferences and other activities—diversity in terms of age, gender, ethnicity, geography, and expertise—is a continuing challenge, and one that also needs to be reflected in the planning process.

Expanding the array of services and products that TRB already provides—or changing the relative balance among them—may also be appropriate, although strategic planning focus group participants dwelled more on changing the means by which the Board markets and delivers its products. Faster and more targeted delivery of reports, especially use of electronic notification and dissemination, is clearly desired by many TRB constituents. The electronic means also provide a tool for improved marketing of TRB products and services. Numerous comments were offered during the strategic planning outreach process on the perceived need to do a better job at ‘selling’ TRB, often simply by doing better at informing target communities about who we are and what we do. This challenge is perhaps more difficult for a research-oriented organization, in that research often has many advocates but no champions.

V. ENVIRONMENTAL SCAN

Issues and Trends Affecting Transportation and TRB’s Role

Introduction

As the entity responsible for conducting long-term planning for TRB, the Executive Committee of the Transportation Research Board has concurrently engaged in developing a new Strategic Plan and compiling an updated list of *Critical Issues in Transportation*—a document that has the broader purpose of identifying key areas and concerns of current interest to the transportation community at large.* What follows is a distillation of the trends and issues as they bear on the future of TRB, to provide the necessary context for the strategic planning update process. The objective is to identify and interpret how the environment, both external and internal, is changing; to project what the environment is likely to look like over the next several years; and to define the implications that this environment may have for TRB. The discussion is organized into three main sections: Transportation Trends, Trends in Funding, and Organizational Trends.

Transportation Trends

An important trend affecting transportation in the United States at the start of the 21st century is the globalization of the economy. While not a new development, global economic integration is being taken to a whole new level by the revolution in information technology, including telecommunications and e-commerce. Time-definite delivery, trackability, and seamless connectivity are the new mantras in goods movement. The Internet is an equalizer providing ease of entry to vendors and customers worldwide.

Business-to-consumer commerce on the Internet has doubled in one year, and the much more significant volume of business-to-business commerce on the Internet is projected to grow explosively over the next several years. And, as the nation’s economy increasingly becomes a service economy, these technologies are reducing the need for critical mass in cities and other employment centers and are acting as a potent force for population dispersal. The United States, which became a nation of suburbs in the last half-century, is now experiencing

* *Critical Issues in Transportation 2002* appears in the November-December 2001 issue of *TR News* and is available on the TRB web site (www.TRB.org).

renewed growth in its rural areas—with impacts on travel and modal choice in the future. While location may be rendered less important by the prevalence of telecommunications technology, mobility continues to be an individual ethos governing Americans' preferences and behavior.

Demographics reveal that the population is growing (although at a slower rate than at mid-century), aging, and becoming more affluent. As the nation absorbs a large influx of new immigrants, we are witnessing what one observer (Alan Pisarski, author of *Commuting in America*) calls “the democratization of mobility.” The automobile continues to be the mode of choice for the vast majority of workers, and the country is also heavily reliant on motor vehicles for the movement of freight and on air transportation for interstate travel. Recently, increases in ridership have been reported on many of the nation's transit systems—an encouraging development after a long period in which transit's share of work trips had declined. Congestion and delay have increased on highways in many metropolitan areas and at major airports, and a variety of other capacity-related problems are evident in rail, water, and air modes. Capacity has not kept pace with the growth of passenger and freight traffic in the latter part of the 20th century, at least in terms of the physical infrastructure; there is still plenty of system capacity but not necessarily where (or when—the peak problem) it's wanted.

Although fatality and serious injury rates associated with transportation have been on a steady decline, fatalities and injuries from transportation crashes constitute a major public health problem. More than 40,000 people still die each year in transportation crashes, 95 percent of which occur on the nation's highways. Achieving significant reductions in fatalities and injuries may ultimately hinge on influencing human behavior—changes that are notoriously difficult to accomplish.

In the area of transportation security, the devastating attacks on the World Trade Center and the Pentagon revealed how vulnerable the U.S. transportation system is to attacks by terrorists. Transportation is a target because it concentrates people in aircraft and terminals and on vehicles that travel through tunnels and over bridges. Strengthening transportation security will require concerted application of new technologies, operations, and deterrence strategies.

In the closing decades of the 20th century, a strong national focus on the environment—especially air and water quality—transformed transportation planning, decision making, and construction in the United States. Great strides have been made in reducing harmful air pollutant emissions and improving water quality through environmental regulation. From the perspective of transportation operators, however, some regulations and prescribed processes can impede or delay construction of needed transportation facilities and significantly increase the costs of the facilities when built. Despite the strides made in air quality, the continuing upward trend in vehicle traffic growth threatens to swamp the gains made through cleaner internal combustion engines.

The nation now faces broader concerns about sustainability—the use of resources in such a way as not to constrain the options and opportunities of future generations. As a major consumer of fossil fuels, transportation is a key player in the sustainability debate. Carbon dioxide emissions, which are linked to global warming, are directly related to the amount of

petroleum fuel burned. Although the United States has not substantively addressed these concerns, there is likely to be growing pressure on policy makers in the years ahead to undertake initiatives or enact legislative mandates in this arena. Development of dramatically more fuel-efficient automobile engines is one approach, with the Partnership for a New Generation of Vehicles (PNGV) providing an example of public-private cooperation towards such a goal. Another approach focuses on promoting higher densities of development ('smart growth' and transit-oriented development) and encouraging or mandating restricted auto use.

Organizational changes in the nation's transport institutions have also been occurring in recent years. The transportation enterprise in this country is highly decentralized—it is not one industry but a collection of industries, involving public and private sectors and every level of government. (For example, more than 30,000 jurisdictions own highways in the United States, and tens of thousands of private companies provide services to transport agencies.) In the private sector, deregulation and competition have resulted in significant and continuing consolidation of railroads, airlines, and trucking firms, with resulting benefits in productivity. Consolidation is now occurring in the construction and engineering fields. In the public sector, some devolution of authority to lower levels of government has occurred, and outsourcing of design and maintenance services is growing. When adjusted for inflation, the state and federal gas tax is near an all-time low, and revenue questions are a real concern for the future—especially when alternative-fuel or hybrid vehicles begin to be introduced on a large scale.

The current 'message' seems to be that Americans want it all—more mobility, more accessibility, more personal space, a better environment—and in the future, there will be more Americans wanting these things. Absent a major crisis that galvanizes public opinion and forces a major policy change, a continuation of current trends can be expected—increasingly stringent environmental regulations and a thirst for space and mobility. The consumer society will become increasingly more customized with more special orders, more deliveries, and more travel. Almost certainly, transport infrastructure will not keep pace with travel demand. The human dimension—people's expectations and adaptability—can perhaps be seen as the wild card in this future. Changes in the way Americans live and work (and in where they live and work), while difficult to predict, are likely to occur.

Developments that will contribute to changes in U.S. transportation in the years ahead, and some of the issues likely to accompany them, include:

- Applications of e-commerce and telecommunications technology to optimize transport efficiency; effects of e-commerce on travel demand and trip distribution, longer-term effects on work and residential location;
- Applications of intelligent transportation systems (ITS) technologies to alleviate congestion and enhance safety;
- Institutional changes and accompanying issues, including devolution of authority to lower levels of government, privatization, outsourcing, and public-private partnerships;

- Regulatory issues affecting a number of transport modes, including consolidation/mergers, safety, and anti-competitive practices;
 - Implementation of increasingly stringent regulations to preserve and protect the environment; challenge of how to reconcile these goals with demands for improved mobility, expanded system capacity in some areas;
 - Development and commercialization of new automotive engine technologies to reduce air pollutant emissions and petroleum use; implications for mobility and transportation finance;
 - Implementation of smart growth and other land use/development options to reduce travel demand and promote more livable communities;
- interaction of these efforts with trends encouraging population dispersal; and
- Proposals for high-speed rail and magnetic levitation (maglev) technologies to enhance passenger rail service in major intercity corridors.

These developments have implications for transportation research and for TRB.

Globalization brings with it many challenges for transportation in the drive to reach new customers, cut costs, and achieve new levels of connectivity in the transport of goods, people, and information. Information dissemination is at the heart of the Board's mission, and given the extremely dynamic pace of change in electronic communications, this is one area where TRB has been 'running' just to stay in the same place. And, despite the increased emphasis on the connections between transport modes, the various modes are not as well coordinated as they could be—enhancing the usefulness of an organization like TRB, which provides a neutral tent and an opportunity to take a multimodal, system-oriented approach to national transportation issues. The downside, however, is that institutions tend to lag behind the pace of change, and the realities of 'stovepipe' government agencies and funding categories often mean that cross-cutting, system-oriented work is difficult to mount. Perceptions lag behind change, as well, and TRB is thus often viewed as highway-dominated and low-tech in orientation. Finally, great effort is required just to stay connected with the changing array of public- and private-sector officials from the organizations that are TRB's core program sponsors.

The good news, however, is that change is occurring. Transportation research is evolving to explore the types of issues highlighted above, and the need for credible research seems to be greater than ever as the world grows more complicated in the connections and movements that characterize work, consumption, leisure, and day-to-day living.

Trends in Funding

TRB's core programs are aimed at fostering interaction among transportation researchers, practitioners, and government administrators and policy-makers. These programs are influenced by the availability and distribution of transportation research funding. Research resources increased under the latest reauthorization of federal surface transportation

programs, the Transportation Equity Act for the 21st Century (TEA-21), but a shift has been occurring in the relative roles of federal and state governments. Federal research dollars for surface transportation have not been growing, and are increasingly encumbered by Congressional earmarks—specific legislative designations of how or by whom the dollars are to be used. The decline in federal discretionary dollars for transportation research is a troubling trend, putting pressure on programs old and new that are supported through these funds. Competition for dwindling federal dollars threatens programs like the Transit Cooperative Research Program (TCRP) and, if the trend continues, could affect the level of the Board's federal core support and policy study activity in the future.

Over the past few years, however, there has been no slackening in Congressional requests for TRB studies. There has also been some Congressional interest in creating new cooperative research programs (most recently, for airports), and there may be opportunities to advance such concepts over the next several years. The focus and funding levels of the next surface transportation authorizing legislation will be debated and shaped over the next two years (TEA-21 authorizations run through FY 2003). States' interests are broadening, and their increased resources under TEA-21 have resulted in the largest National Cooperative Highway Research Program (NCHRP) ever (\$29 million in FY 2000). With a trend toward greater devolution, responsibility for a quality national research program in transportation could increasingly fall to the states. Given their historical importance to TRB's core funding and mission, their future is critical to the Board's. But, as is often noted, research is never #1 on anyone's agenda, and state transport agency leadership turns over very quickly, making it difficult for the agency heads without prior transportation experience to develop full appreciation of the longer-term value of research to their departments.

Historically, TRB's principal connection has been with the public-sector providers of transportation infrastructure; other constituencies have been added around that central core. Participation by the private sector has never been as extensive as the Board would like it to be. Perhaps this is inevitable given the short-term, bottom-line orientation of companies operating in the private sector. It seems that this perspective has been further foreshortened in the current era of dynamic change, in which globalization and the other trends described in the first section have solidified the connections between transportation and logistics, creating new business relationships and expectations. Investment in an institution like TRB may not be perceived to yield significant returns in the Internet-speed time frame in which such companies must operate.

On the other hand, in an era in which public-private dialogue and partnerships have become increasingly important, the Board's neutral forum affords an opportunity for candid discussion and relationship-building that may well be attractive to a broader range of private-sector interests. TRB's objectivity and its multimodal focus make it increasingly unusual in a world populated by organizations that have both explicit and implicit goals and agendas. From the Board's perspective, however, a considerable ongoing effort is required in order to maintain existing relationships with an already large group of stakeholders. How much effort can and should be devoted to nurturing new ones--some of whom are on the fringe and difficult to attract or retain in any case? Finding ways to increase the participation and funding support from private companies within the Academies' institutional ground rules will be a continuing challenge in the coming years.

In this era of globalization, more interaction than ever is occurring among the research communities of different nations. TRB has a significant international presence at its Annual Meeting and also participates with a variety of foreign institutions in information exchange and in specialty conferences and related activities, both here and abroad. One question for the Board, as a national organization, is whether and how it should seek to increase its international role.

Organizational Trends

Given its volunteer-based operation, TRB's core program draws its strength from its participants—the thousands of dedicated volunteers who 'work for' TRB. Thus one trend that may pose a threat is the proliferation of other organizations (and meetings), all competing for the limited time volunteers have to devote to *pro bono* activities. Some of these other organizations have structures that include state and local chapters, facilitating local, grass-roots participation. Many of the organizations have a more specialized focus than TRB, concentrating on a specific mode, profession, technology, or area of transportation; some are advocates or *de facto* lobbyists for a sector, industry, or point of view; and some occasionally compete with TRB for research dollars. For TRB to continue to prosper, it needs to distinguish itself and its mission from the goals and missions of these other organizations, while taking stock of where the competition for people, time, and dollars may be heading.

In general, outside demand for TRB products and services has probably never been greater. The number of core program sponsors is close to an all-time high, although there are some significant gaps in sponsorship that have proved difficult to close. Specialty conferences and workshops and Annual Meeting activity (in terms of both papers and participants) are also at a high point. As noted previously, the NCHRP program is larger under TEA-21 than ever before; on the other hand, TCRP has been funded at a reduced scale because of Congressional diversion of some of its authorized funds to other purposes.

Finally, the ways in which TRB does its work are changing under the impetus of increasing demands for quick turnaround and electronic dissemination. The demand for electronic dissemination of TRB products and services has been coupled with a growing demand for electronic communication among the Board's volunteer constituents. As a result, TRB has had to move quickly to improve its web site, extend the utility of the resources provided on the Internet, and add new resources. At the same time, there is recognition that some aspects of TRB committee activity can only be conducted in face-to-face meetings and that the Board's role as an independent convener of expert groups will continue to be a strong suit in the future.