

**The National Academies**

# **TRANSPORTATION RESEARCH BOARD**

**STRATEGIC PLAN**



**Adopted June, 2014**

# TRB STRATEGIC PLAN

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## INTRODUCTION

As anyone who has ever developed a strategic plan for an organization knows, the process for development of the plan is as important as the resulting plan itself. A successful process must involve the organization's stakeholders. Not only does this engagement provide an important source of information about the performance of the organization and the direction it should be going, but it provides the stakeholders with a sense of ownership in its future. This is particularly true for TRB as an organization that depends on voluntary financial support and on active involvement in its activities.

Consequently, the TRB Executive Committee relied heavily on the following activities in developing this TRB strategic plan:

- Information and input generated during the development of *Critical Issues in Transportation*, published in late 2013;
- Recommendations generated by the NRC Governing Board's Triennial Review of TRB in 2013;
- A survey of TRB leaders conducted in December 2013;
- Focus groups held in conjunction with the TRB Annual Meeting in January 2014; and
- Meetings and interviews conducted during 2013 and 2014 with members of the TRB Executive Committee, oversight and steering committees for major TRB programs, and key stakeholders and affiliates.

This strategic plan—which will guide the direction, programs, and activities of TRB for the next five years—is a culmination of these efforts.

*Adopted by the TRB Executive Committee – June 25, 2014*

## I. TRB TODAY

### **TRB Mission**

*Provide Leadership in Transportation Innovation and Progress Through Research, Discourse, and Information Exchange*

The mission of the Transportation Research Board is to increase the benefits that transportation contributes to society by providing leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal.

### **TRB Overview**

TRB is one of six major divisions of the National Research Council (NRC)—a private, nonprofit institution that is the principal operating agency of the National Academies in providing services to the government, the public, and the scientific and engineering communities. NRC is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

TRB was established in 1920 as the National Advisory Board on Highway Research to share information and research results on highway technology. For more than four decades, the organization accomplished its mission through meetings of standing committees, production of publications, and convening an annual meeting. In 1962, TRB initiated its first continuing research management activity—the National Cooperative Highway Research Program (NCHRP). In 1974, the Highway Research Board became the Transportation Research Board in recognition of the increasingly multimodal focus of its work. Since 1982, TRB has conducted an influential program of policy studies on issues of national importance in transportation.

TRB's portfolio of services continues to grow. TRB's varied activities annually engage more than 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise as volunteers by participating on TRB committees, panels, and task forces. TRB provides services and products

that represent all major modes of transportation and a range of technical disciplines including engineering, planning, research, operations, policy, and more. TRB's core services include the following:

- *Providing a forum for information exchange*—TRB hosts more than 200 standing committees, an annual meeting with attendance approaching 12,000, and more than 50 specialty conferences annually. These forums continue to draw volunteers from around the globe, increasing in numbers even during economically challenging times for transportation agencies. Electronic communications, such as webinars, e-newsletters, and social media provide additional forums for communication among TRB members, volunteers, affiliates, and other interested parties.
- *Managing research programs*—TRB administers federally funded applied research programs on behalf of other organizations. NCHRP is the largest of TRB's research programs, funded at \$39 million in fiscal year 2013. NCHRP is sponsored by the state departments of transportation (DOTs) in cooperation with the Federal Highway Administration (FHWA). The Airport Cooperative Research Program (ACRP) was funded at just under \$15 million in FY 2013 and is sponsored by the Federal Aviation Administration. The Transit Cooperative Research Program (TCRP) is sponsored by the Federal Transit Administration; funding in FY 2013 was \$3.5 million. In addition, TRB is completing work on three Cooperative Research Programs that were authorized by Congress but for which future funding has not been made available—freight, rail, and hazardous materials. TRB also manages the Innovations Deserving Exploratory Analysis, or IDEA, programs and the synthesis study programs. Beginning in 2006, TRB has managed the second Strategic Highway Research Program (SHRP 2), authorized by Congress to investigate the underlying causes of highway crashes and congestion in a short-term program of focused research. The TRB management of the SHRP 2 program is scheduled to be completed in 2015.
- *Developing policy analysis based on objective data and research*—TRB has conducted more than 100 studies at the request of Congress, federal agencies, the states, and other organizations on complex and sometimes controversial transportation topics of national importance. Each study is conducted by an appointed independent committee of

volunteers, carefully selected to provide expertise in specific technical and policy areas and a balance of perspectives on the issues involved. Topics addressed over the years have included such high-profile issues as automotive and school bus safety, economic impacts of transportation investments, security, airline and railroad deregulation, counterterrorism, and high-speed rail.

- *Disseminating transportation research results*—TRB disseminates transportation research results in several different types of documents and formats. TRB manages and maintains the TRID database—the world’s largest and most comprehensive bibliographic source on transportation information. TRID contains more than one million records of published and ongoing research, covering all modes and disciplines of transportation. TRB publishes more than 200 reports annually that contain the results of the Cooperative Research Programs studies, policy studies, syntheses, and other initiatives. The organization’s peer-reviewed journal, the *Transportation Research Record*, includes papers submitted to and reviewed by TRB’s extensive structure of standing committees. TRB also publishes *TR News* magazine on a bimonthly basis. The *TRB Transportation Research E-Newsletter* is a free weekly electronic service designed to keep individuals up-to-date on TRB activities and to highlight selected transportation research-related activities taking place at the federal and state levels and within the academic and international transportation communities. More than 48,000 people around the world receive the e-newsletter.

This portfolio of services enjoys substantial support by TRB’s stakeholders, as evidenced by the responses to a December 2013 survey from more than 500 TRB leaders.

## **TRB SWOT Analysis**

As part of the strategic planning process, TRB undertook an extensive review of the transportation environment and TRB's current activities. An environmental scan was conducted to identify the factors influencing the strategic direction of the organization. An examination of the strengths, opportunities, limitations, and challenges (rewording the classic SWOT analysis of strengths, weaknesses, opportunities, and threats ) was conducted in consultation with TRB stakeholders. A survey and a set of focus groups involved the full array of TRB leaders, including TRB Executive Committee and Technical Activities Council members, volunteer chairs of TRB standing committees and research panels, and representatives of the University Transportation Centers, as well as TRB staff. The following summarizes what was learned in that analysis.

### ***TRB Strengths***

TRB retains a unique brand as a *convener* of the transportation community to share information on objective, data-rich research, and on the hottest topics in transportation. TRB conferences, webinars, and the annual meeting provide outstanding networking opportunities for the TRB community, a valuable benefit to TRB constituents. This unique blend of participants and services sets TRB apart from its peers and contributes to the visibility of the organization within the transportation community. Other strengths that contribute to TRB's success as an organization include the following:

- The TRB Annual Meeting retains a reputation as the premier conference for the transportation community and is the largest gathering of transportation professionals in the world. More than 100 organizations and groups take the opportunity to piggyback their own meetings onto the TRB Annual Meeting.
- As part of the National Academies and NRC, TRB offers balanced, unbiased, and credible research and products.
- TRB provides an array of distinct services that can operate independently or in an integrated fashion.
- TRB involves a diversity of stakeholders and constituents and applies a variety of approaches to bring them together.

- TRB maintains the ability to use volunteers as a principal resource.
- TRB's core products have earned popularity.

### ***TRB Opportunities***

TRB is well-positioned to take advantage of its reputation in the transportation community as a forum for dialogue on issues of far-reaching national and international significance. As transportation evolves in response to market changes, TRB can retain its reputation as “cutting-edge” by providing new and efficient means of engagement and dissemination of its products. The following opportunities could increase TRB's access to a growing population of current and potential stakeholders.

- TRB can uniquely address critical issues in transportation that are crosscutting and that have far-reaching impact.
- The emergence of new services, service providers, and institutional paradigms can bring in new partners and financial sponsors.
- Communications technologies are now available that can provide new forums for engagement, cost-effective opportunities to disseminate research, and information exchanges.
- Increasing international interest and engagement in TRB can facilitate the diversification of the organization and the breadth and depth of its dialogue.

### ***TRB Limitations and Challenges***

Like many large organizations, TRB encounters bureaucratic procedures and rules that can result in inefficiencies in operations and that can appear arcane and confusing to its customers. These challenges seem particularly acute at a time when electronic communications technologies have created the expectation of quick and seamless processes and products. At the same time, many of the procedures and oversight requirements that can slow production also contribute to TRB's objectivity and balance in its work. TRB is actively addressing many of the communications and technological challenges that affect the day-to-day operations of the organization and how it interacts with its customers. However, there are some fundamental trends that need attention in a



more strategic fashion if TRB is to remain relevant to the transportation community. These include the following:

- Reliance on the federal government when highly polarized philosophies hinder a consensus on funding, notably for the surface transport trust fund;
- Diminishing investments in research by the public sector;
- Reductions in financial and human resources available for transportation organizations to invest in TRB;
- Continuing competition with other organizations and increasing competition with other emerging avenues for information dissemination; and
- Society's growing desire and expectation for quick answers to complex questions.

### **Building on Recent TRB Strategic Initiatives**

TRB's most recent strategic plan, adopted in 2007, provided direction for TRB to evaluate its performance continuously while delivering its products and services to the transportation community in a changing marketplace. Some of the recent strategic initiatives that TRB has undertaken in implementing the 2007 TRB Strategic Plan include the following:

- Identifying and addressing critical and emerging transportation issues;
- Generating greater involvement by women, minorities, and young professionals;
- Increasing opportunities for effective international engagement;
- Leveraging technology to create and market new products and to improve communications with its volunteers and customers;
- Implementing new revenue-generating services and activities;
- Enhancing the benefits to sponsors of TRB core programs without increasing annual dues;
- Identifying and implementing additional methods to enable continued active participation and engagement with less reliance on travel; and
- Successfully managing SHRP 2.

Just as the 2007 TRB strategic plan provided the direction and foundation for many TRB initiatives over the past five years, so too the goals and strategies in this plan will guide TRB's efforts in the coming years to provide leadership in transportation innovation and progress through research and information exchange.

## II. VISION AND GOALS

### Vision

- Impactful:
  - Identifies emerging issues,
  - Brings practitioners and researchers together to promote innovation in transportation, and
  - Provides government with advice on major transportation issues;
- Informative:

Generates and disseminates information on long-term issues of strategic, national, and international importance, as well as on practical, technical information and shorter-term policy issues; and
- Resourceful:
  - Delivers information and research efficiently and effectively to inform decisions on investments, practices, policies; and
  - Promotes collaboration across the diversity of participants in TRB programs and activities.

#### TRB VISION

*TRB is where the nation's leaders and the transportation community turn for research, innovation, collaboration, and advice on emerging and critical transportation issues.*

### TRB Goals

1. Anticipate transportation challenges and provide leadership in promoting and conducting research and policy analysis to help meet those challenges.
2. Conduct and promote knowledge creation and dissemination, especially on innovative practices and technologies in the transportation sector.
3. Provide timely and informed advice on transportation and transportation-related issues to decision makers and others who are responsible for multimodal transportation systems.

4. Act as an effective and impartial forum for the exchange of knowledge and information, including transportation and its relationship with social, economic, environmental, and other issues.
5. Promote collaboration on transportation research, education, and technology transfer at international, national, regional, state, and local levels; across public and private sectors; and with transportation providers, customers, and other stakeholders.
6. Contribute to the professional development of individuals currently working in transportation and to the education and enhanced diversity of the pool of individuals who will work in the field in the future.
7. Conduct and promote communications efforts to enhance the awareness of transportation research and its contributions to innovation and progress in transportation.
8. Contribute to the public's understanding of transportation and its significance to society.

### **III. STRATEGIES AND ACTION ITEMS**

#### **Strategies**

The strategies that TRB will employ to achieve the vision and to accomplish the goals contained in the preceding section are as follows:

1. Develop and implement processes to identify and address emerging and critical transportation issues in a more strategic and proactive manner.
2. Take steps to involve a broader cross section of stakeholders and constituencies in TRB programs and activities.
3. Conduct strategic reviews of the portfolio of TRB legacy programs and products and introduce new activities, to meet the critical needs in today's marketplace.
4. Apply more systematic approaches for identifying and tracking the impacts of TRB's research programs.
5. Strengthen the long-term financial stability of TRB by augmenting traditional federal and/or federally derived sources of funding.
6. Develop and implement coordinated approaches to communicate information on TRB activities and products that address emerging and critical issues.
7. Provide TRB staff with the knowledge, resources, and tools necessary to meet and exceed the expectations of TRB stakeholders and customers.

These strategies build on TRB's strengths and take advantage of the opportunities summarized in the previous sections. More details are given in the environmental scan and SWOT analysis in the Appendix to this plan.

## Action Items

Actions to pursue these strategies are listed below. These actions will be tracked through a combination of quantitative and qualitative performance indicators. The action items will be adjusted and augmented as necessary over the life of this strategic plan.<sup>1</sup>

### **Strategy 1. Develop and implement processes to identify and address emerging and critical transportation issues in a more strategic and proactive manner. (Goals 1, 3, 4, 7, 8)**

Action items:

- a) Annually designate one or more “hot topics,” drawing from TRB’s *Critical Issues in Transportation 2013* and other sources. (Current examples include connected and automated vehicles, climate change, resiliency, changing demographics, and funding.)
- b) Develop and implement action plans to address each hot topic. Plans should include consideration of all programs and activities at TRB’s disposal, how to address the issues within TRB’s structure, the desired outcomes, and the communications and outreach efforts.
- c) Involve other NRC units to help identify and address these issues.

### **Strategy 2. Take steps to involve a broader cross section of stakeholders and constituencies in TRB programs and activities. (Goals 5, 6, 7, 8)**

Action items:

- a) Conduct a strategic review of TRB’s Sponsor and Affiliate programs, including the costs and benefits. Identify and implement opportunities that more directly match these programs to the differing needs of current and potential stakeholders.
- b) Pilot and seek continuing funding for roundtables to bring together constituencies that depend on one another but that do not frequently mix to discuss issues of mutual interest. (Examples may include logistics professionals and public or private service providers, or transportation agencies and environmental regulatory groups.)

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<sup>1</sup> The action items listed are new or will be receiving increased emphasis from TRB as part of this plan. The myriad activities that TRB carries out on an ongoing basis are not all listed in this section but are summarized in other parts of this plan.

- c) Take actions to involve state DOT CEOs and other agency leaders to a greater extent in TRB activities, including the TRB Annual Meeting program.
- d) Provide incentives and take other steps to facilitate the involvement of nontraditional stakeholders whose participation would enhance TRB programs and activities.
- e) Reach out to other U.S. and international organizations to help address emerging and critical issues systematically.
- f) Proactively pursue avenues to involve other units of the NRC in TRB programs and activities and to provide other NRC units with a better understanding of TRB activities. Such avenues may include presentations by other NRC units at the TRB Annual Meeting, participation by staff from these units in a broader variety of TRB activities, and reimbursing these units for time spent on TRB activities.

**Strategy 3. Conduct strategic reviews of the portfolio of TRB legacy programs and products, and introduce new activities, to meet the critical needs in today's marketplace.** (Goals 2, 6, 7, 8)

Action items:

- a) Review the research and policy studies programs managed by TRB. Identify and pursue opportunities for further enhancements and streamlining in a manner that does not compromise the quality of the research.
- b) Survey attendees after the 2015 TRB Annual Meeting to identify opportunities to take maximum advantage of the new meeting venue.
- c) Conduct evaluations of the value, quality, and timeliness of TRB legacy publications such as the *Transportation Research Record*, *TR News*, conference proceedings, e-circulars, and annual reports.
- d) Continue to evaluate and evolve the *Transportation Research Record* by benchmarking it against competing journals, increasing rankings and citation ratings, perhaps transitioning to an all-electronic journal, possibly publishing separate journals by major topic or audiences, and reducing the time from submission to publication.
- e) Review TRB's processes and timelines for paper submissions, peer reviews, and publication. Pursue opportunities for improving these processes and reducing the time from submission to dissemination.

- f) Develop and implement a TRB training program to enhance the knowledge, skills, and abilities of transportation research program managers

**Strategy 4. Apply more systematic approaches for identifying and tracking the impacts of TRB’s research programs.** (Goals 5, 7, 8)

Action items:

- a) Conduct periodic stakeholder surveys for each major TRB program, to solicit feedback on, and examples of, the impacts of these programs.
- b) Expand efforts such as the Research Pays Off series, the Key Research Achievements database, the AASHTO RAC annual “Sweet 16,” and the ACRP Impacts on Practice.
- c) Augment programs such as the annual TRB–State DOT partnership visits and the ACRP Ambassadors Program to solicit specific information on the impacts of TRB’s research activities.
- d) Request committees that receive an annual allocation of Cooperative Research Programs funds to report on the benefits from previous funded projects.
- e) Implement a strategic approach to communicate the impacts of TRB research programs to TRB stakeholders and to decision makers.

**Strategy 5. Strengthen the long-term financial stability of TRB by augmenting traditional federal or federally derived sources of funding.** (Supports all goals.)

Action items:

- a) Pursue funding from a broader range of sources, including philanthropy, in support of and in coordination with strategies to broaden the activities and diversity of TRB
- b) Offer more private-sector funding opportunities in conjunction with the TRB Annual Meeting and other conferences.
- c) Seek direct funding from agencies for Cooperative Research Programs activities (e.g., transit agencies supporting a portion of TCRP directly).
- d) Offer pooled-funding arrangements to state DOTs and other stakeholders to support TRB activities such as conferences and policy studies.
- e) Develop and implement capital budgeting processes for selected larger, multiyear investments.



**Strategy 6. Develop and implement coordinated approaches to communicate information on TRB activities and products that address emerging and critical issues.** (Goals 2, 4, 5, 7, 8)

Action items:

- a) Develop and implement a marketing plan for each TRB policy study report.
- b) Take steps to coordinate the roles and messages across TRB communications outlets, including the *TRB Transportation Research E-Newsletter*, *TR News*, social media, and annual reports.
- c) Take steps to accommodate the increasing reliance on electronic communications and social media over printed publications.
- d) Enhance TRB's capacity to deliver webinars to accommodate the rapid growth in demand.
- e) Produce easy-to-understand communications that provide overviews of TRB and its programs and activities.

**Strategy 7. Provide TRB staff with the knowledge, resources, and tools necessary to meet and exceed the expectations of TRB stakeholders and customers.** (Supports all goals.)

Action items:

- a) Work with the NRC to rationalize the software and information infrastructure, considering what portions should be common, shared, and standardized.
- b) Implement and advance software applications for volunteer engagement management and for paper review and Annual Meeting planning. Exercise discipline to emerge with a best-of-breed system that supports modern business practices.
- c) Develop and employ succession plans and scenarios for senior leadership positions, including training in administration and leadership.

## IV. APPENDICES

### Appendix A. Environmental Scan: Trends and Issues Affecting TRB

In accordance with one of its charges, the TRB Executive Committee developed this strategic plan. The development of this plan followed the publication of an updated list of *Critical Issues in Transportation: 2013* (issued in late 2013)—a document that has the broader purpose of identifying key areas and concerns of current interest to the transportation community. These trends and issues bear on the future of TRB, in the sense that the organization is—or should be—affected by changes in the transportation enterprise itself. As transportation evolves, the needs of system users, providers, and operators change too; and many of these groups are customers of TRB services, products, and programs. An environmental scan therefore must consider factors that directly affect the Board’s ability to respond to customer needs, along with longer-term issues that will influence TRB indirectly by changing its customers’ requirements. The discussion of these trends and issues is organized into three main sections: Customers, Institutional Environment, and Resources.

#### **Customers**

TRB involved its stakeholders in this strategic planning process in three important ways. An on-line survey was sent to more than 1,200 leadership representatives of the organization in December 2013; recipients included standing committee and research panel chairs, TRB staff, and major sponsors and affiliates. More than 500 surveys were returned, providing a rich source of data on TRB’s performance, as well as input on the organization’s future direction and activities. A second source of input came from four focus groups at the 2014 TRB Annual Meeting. The focus groups comprised committee and panel chairs, representatives of the TRB Young Members Council, representatives of the university community, and a crosscutting session with a mix of these factions. Lastly, meetings and interviews with members of the TRB Executive Committee, the Technical Activities Council, and major stakeholders and affiliates were held to collect input for the strategic plan. In addition to internally generated data on TRB performance, as well as on external activities and trends, these outreach activities helped inform the following environmental scan.

The transportation enterprise is expanding and evolving, both in the United States and around the world. Many of these changes, documented in *Critical Issues*, have direct relevance to TRB because they have implications for customers' needs—for those who use TRB products and services, for transportation researchers, and for the transportation system itself. Examples of such contextual factors include changing demographics within the professional community; increased technical sophistication; globalization of the economy; the proliferation of extreme weather events and global climate change; continued population growth; increasing congestion and delay; changes in travel behavior, including a leveling-off in per capita travel and shifts in preferences by the youngest driving-age cohorts; loss of leadership in road safety; broader concerns about sustainability and transportation's role; continuing decentralization of transportation decision making; and growth in public-private partnerships and tolling. These and the other key trends described in *Critical Issues* have important implications for transportation system users, providers, and operators. What will these trends mean in turn for TRB?

First, these changes have implications for transportation research. TRB's customers have long looked to the Board to identify new issues and priorities for research. Research is needed on a variety of topics that could enhance our understanding of the challenges facing the U.S. transportation system. Some fruitful areas of investigation might include the following:

- *Congestion* across all modes of transportation, with significant constraints on capacity in many areas;
- Applications of *e-commerce and telecommunications technology* to optimize transport efficiency, affecting travel demand and trip distribution and potentially, in the longer term, work and residential location;
- Applications of *intelligent transportation systems technologies* to enhance safety and improve transportation system performance;
- *More effective management of existing and new transport facilities*, to improve performance and increase capacity;
- *Systems-level responses* to address capacity and funding shortfalls, absent laws and institutions to respond to those needs;

- *Institutional changes* and accompanying issues, potentially including devolution of authority to lower levels of government, privatization, outsourcing, and public–private partnerships;
- The extent and implications of an apparent *shift in public support for user fees*, with the erosion of the historical near-universal support for gas taxes;
- *Applications of technology to facilitate more direct charging for use* of aviation and highway facilities—and the broader, societal implications of these applications;
- Issues concerning *equity and environmental justice*, including the limited mobility of the most disadvantaged populations, who also often bear the brunt of negative side effects from transportation facilities;
- The many challenges for transportation posed by *globalization*, in the drive to reach new customers, cut costs, and achieve new levels of connectivity in the transport of goods, people, and information;
- Expanded emphasis on, and need for cost-effective approaches to, *security and emergency response*, absent significant new revenues to support such efforts;
- The availability of—and the *associated privacy and other legal concerns* related to—the collection and use of geospatial and other large data sets for informing transportation planning and policy;
- *Preservation and protection of the environment*, in light of continued demands for improved mobility and expanded system capacity in some areas;
- Transportation and *land use relationships* and the institutions governing them;
- Transportation’s role in addressing a range of *social and economic issues*, such as access to jobs and health care, distribution of goods and services, and economic development;
- *Sustainability issues*, ranging from global climate change and energy consumption to local air quality and related health issues; and
- Development and commercialization of *new engine technologies and alternative fuels* to reduce air pollutant emissions and petroleum use.

Transportation research is evolving to explore these issues, and the need for credible research appears greater than ever, as the world grows more complicated in the connections and movements that characterize work, consumption, leisure, and day-to-day living.

TRB's customers include many of the major institutions responsible for transportation in the United States, but in many instances these responsibilities are in a state of flux. The trend in the past 20 years has been a devolution toward individual entities in transportation decision making and investment. Transportation is not one industry but a collection of industries and organizations, involving public and private sectors and every level of government. In the private sector, deregulation and competition have resulted in significant gains in economic efficiency, combined with the consolidation of railroads, airlines, and trucking firms; consolidation is now occurring in the construction and engineering fields as well. In the public sector, some devolution of authority to lower levels of government has occurred, and outsourcing of design and maintenance services to the private sector is becoming the norm. Many states and metropolitan areas have implemented public-private partnerships that promote private-sector investment in transportation infrastructure.

Many important questions, with significant potential impact on TRB, emerge from this dynamic environment. Will state transportation agencies become more or less important in this changing environment? What role will metropolitan planning organizations play? What will the federal role look like in 10 or 20 years? What will be the impacts of the continued fragmentation of federal transportation research programs? Will they continue to decline in scale, as in recent years, or will support for research rebound? How significant a role will private financing play in transportation investment? What are the prospects for private-sector initiatives such as automated vehicles and shared mobility services, and how might these change the nature of transportation? How will the passenger- and freight-moving sectors collaborate in fostering a systems approach to transportation investment? In a financially constrained environment, will public-sector institutions invest in research and in the implementation of research results? There is a strong likelihood that many new customers of TRB services could emerge from a changing institutional environment in transportation, and there also is a risk of attrition in TRB's traditional customer base, particularly with the uncertainties about the federal funding of transportation programs.

The demographics of the transportation professional community are also changing, with retirements of the "old guard" in many organizations and the emergence of a younger, much more

diverse work force engaged in a broader range of disciplines. TRB can support the needs of the changing transportation professional community to facilitate professional development and to serve new and changing audiences.

Accommodating these changes will require internal analysis and customer feedback. It may require challenging long-held assumptions, and accepting that customers' perceptions of the value they expect from TRB may have changed over the years. It may also require helping TRB's customers gain a better understanding of the utility and relevance of TRB products and services in the current environment.

### **Institutional Environment**

The demand for—and the value placed on—TRB products and services remains strong. Annual Meeting activity in the numbers of papers and participants is at an all-time high, as are subscriptions to the *TRB Transportation Research E-Newsletter*, use of the TRID and Research in Progress databases, participation in TRB webinars, and visits to TRB's homepage. The Annual Meeting attracted almost 12,000 individual participants in 2014, and participation in TRB webinars topped 20,000.

However, the institutional environment for TRB activities also indicates future challenges. Core program sponsorship from several transportation sectors has declined in recent years and faces the continued uncertainty about the direction and scale of future federal transportation programs; some significant gaps in sponsorship have proved difficult to close; and except for the continuing reviews of USDOT R&D programs, requests for policy studies from traditional sources such as USDOT and Congress have declined and have tended to be episodic and focused on specific problems, not on broader transportation issues. In addition, the Board has had limited success in engaging top leaders from several of the sponsor organizations in TRB activities, making their role less effective than it might be.

Given its volunteer-based operation, TRB's core program draws its strength from its participants—the thousands of dedicated volunteers who make TRB successful. The proliferation of other organizations and meetings competing for the limited time that volunteers have to devote

to pro bono activities is worrisome. 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 funding. TRB 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 this era of globalization, with more interaction than ever among researchers worldwide, TRB has a significant, and growing, international presence at its Annual Meeting, and in recent years the Board has actively sought to participate with a growing number of foreign institutions in information exchange and in specialty conferences and related activities, both here and abroad. A strategic question for TRB, as a national organization, is how to define and enhance its international role to foster productive collaboration on transportation research, education, and technology transfer.

Finally, the demands on TRB operations reflect the expectations that customers have for services that are now provided in a fast-paced society. 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 moved quickly to improve its website, introduce social networking, 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 best be conducted in face-to-face meetings and that the Board's role as an independent convener of expert groups will continue to be an important function in the future.

## **Resources**

TRB's core programs are affected by the availability and distribution of transportation research funding, which has been affected by the overall downward pressure on federal spending in recent years. The latest reauthorization of federal surface transportation programs, the Moving Ahead for Progress in the 21st Century Act (MAP-21), reduced R&D funding relative to the preceding SAFETEA-LU legislation, although it also eliminated designations and earmarks and gave the

USDOT more discretion over what is to be funded. MAP-21 is a two-year bill, and such short time horizons are not conducive to effective R&D programs. Competition for dwindling discretionary federal dollars threatens the Board's policy study activity, future core support from federal agencies, and support for a number of the Cooperative Research Programs. The two smallest Cooperative Research Programs, in freight and in hazardous materials transportation, were zeroed out in MAP-21.

With the current trend toward downsizing the federal role in surface transportation, the future of the State Planning and Research (SP&R) program is uncertain. Significant reductions in that program—the primary source of funding for NCHRP and for about half of TRB's core program—would significantly affect TRB's ability to carry out its mission.

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, given the growing list of competing needs for limited state transportation dollars and the temporary tenure of most state transportation agency leaders, state agency commitments to TRB and other research programs are tenuous at best. As noted above, federal aid designated for research through the SP&R program underpins the state programs. Therefore, if the federal-aid program to transportation research continues to decline under the new transportation authorization legislation, it is critical that TRB demonstrate to these organizations and their leadership both the short-term as well as the longer-term value of investments in transportation research. As devolution proceeds to the regional and local levels, TRB will similarly need to attract the participation and investment of the toll authorities, private transportation providers, nonprofits, and other local or regional transportation operating entities, which typically have not played as prominent a role in supporting research, or which invest in their own focused research programs.

A perennial issue for TRB and other research organizations is the challenge of persuading individual sponsors, public or private, that they are receiving value commensurate with their contributions. The value of the investment in research is difficult to measure, and payoffs are likely to be realized over a longer time frame than many consider desirable. If transportation



budgets become even tighter in the future, some of the core agency support for the TRB program could be vulnerable. Moreover, in an organization that enjoys the collective support of many or all agencies of one type—in TRB’s case, for example, state transportation departments—the loss of one or two of these agencies would not dramatically alter the level of support for TRB, and some agencies might consider that they too could derive much the same benefits as “free riders” on the system. If such reasoning became more general, the whole structure of support would collapse.

Historically, TRB’s principal connection has been with the public-sector providers of transportation infrastructure and services; other constituencies have been added around this central core. In recent years, several non-USDOT federal agencies with interests in transportation—including the Department of Energy, the Environmental Protection Agency, the Department of Homeland Security, and NASA— have cycled in and out of sponsorship. When these agencies were TRB sponsors, it was difficult to attract substantive participation from agency leaders. This has also been an issue with some continuing federal sponsors. On the other hand, there has been significant growth in study and workshop activities on offshore engineering, under the Marine Board banner, funded by the Bureau of Safety and Environmental Enforcement of the U.S. Department of the Interior. The air quality regulatory agency for southern California, the South Coast Air Quality Management District, came on board as a TRB sponsor in 2011, and the Air Force Engineering Center joined as a new sponsor in 2013.

Increased participation by private firms has been a TRB goal for many years, but has been difficult to achieve. This era of dynamic change, in which globalization and just-in-time delivery have solidified the connections between transportation and logistics, has given rise to new business relationships and expectations, which often do not lend themselves to longer-term research activities. Investment in an institution like TRB may not be perceived to yield significant returns in an environment in which business transactions can often be nearly instantaneous. However, 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, a considerable

ongoing effort is required to maintain relationships with an already large group of stakeholders. How much effort can and should be devoted to nurturing new ones—some of whom are only now entering the transportation arena and are likely to be 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.

## Appendix B. Performance Assessment

TRB is a 93-year-old, independent, nonprofit U.S. institution that promotes and conducts transportation research and information exchange; serves as a neutral forum for research-related meetings and activities; manages contract research programs in highways, public transportation, airports, and rail; conducts balanced studies by expert committees on national transportation policy issues; and publishes and disseminates widely the results of research.

### **Strengths**

- A well-established constituency that is both broad and deep.
  - A unique forum that cuts across all modes of transportation; engages public, private, and academic sectors; and attracts participation by individuals at all levels, from industry leaders to senior- and mid-level professionals to graduate students.
  - Historic and continuing ties to the U.S. highway community and the state highway and transportation agencies.
  - Highly engaged networks of TRB liaisons, particularly at state DOTs, that provide a continuing connection and linkage to senior management.
  - A broad sponsorship base including current sponsorship by most of the modal and other component administrations within USDOT.
  - Participation, although uneven, by all modes of transportation in TRB activities.
- A volunteer network of more than 7,000 transportation experts who serve on a diverse array of TRB technical committees and panels and who participate in a range of TRB activities.
  - A bottom-up, grass-roots structure of more than 200 standing technical committees that attract broad participation from the transportation community—from students to top-level leaders of transportation organizations.
  - Activities that engage and successfully link researchers, practitioners, and policy makers.

- Linkage through NRC to the National Academy of Sciences, the National Academy of Engineering, and the 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 and media attention to programs and products.
  - NRC processes that govern committee appointments and report review ensure that policy studies and other projects on major transportation issues are conducted objectively by balanced committees of experts - and one that reflects diversity in terms of age, gender, ethnicity, geography, and expertise - who serve without compensation.
- A long-standing reputation for credibility, objectivity, and neutrality.
  - These traits make TRB attractive as an institution to conduct policy studies on national transportation issues, and to convene conferences and other meetings of parties with differing perspectives on technical or policy issues.
  - TRB's Cooperative Research Programs provide an important body of research that informs the practices and policies adopted by federal, state, local, and private providers of transportation.
- TRB's peer-reviewed papers and reports are a critical component of the national and international transportation literature.
- An 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 12,000 attendees to exchange research results and information on all aspects of transportation.
  - The *Transportation Research Record: Journal of the Transportation Research Board* provides a collection of peer-reviewed technical papers grouped by subject matter.
  - The Cooperative Research Programs are customer-oriented programs of contract research, in which the customers—state transportation agencies for NCHRP, transit operators for TCRP, airport managers for ACRP—select problems for pool-funded research, conducted with the guidance of small panels of volunteer experts.

Approximately 3,000 volunteers participated in Cooperative Research Program panels in 2013. More than 130 reports were published in 2013.

- TRID—the world’s largest and most comprehensive online bibliographic database of transportation research information—is available free of charge on the web.
- Policy studies conducted according to NRC procedures explore national transportation issues.
- SHRP 2, a congressionally authorized program, pursues targeted research in four vital theme areas for highways: safety, capacity, reliability, and renewal.
- A large, varied, and growing program to disseminate and communicate research results, enabled by TRB’s capacity to implement and expand use of new technology fairly quickly.
  - More than 225 publications are released annually, most available online for free.
  - The *TRB Transportation Research E-Newsletter* reaches 50,000 subscribers weekly.
  - The webinar series attracts participation by more than 8,000 individuals annually; the rapid growth of this series exemplifies the capacity to take quick advantage of new technology.
  - Use of social media for communication and outreach is expanding.
- A diverse, experienced, dedicated staff.
  - Staff includes a variety of specialists well-recognized in their fields.
  - Staff members have long-standing 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 components of TRB results in an organization that is stronger and more influential than all of its individual parts.
  - TRB is a unifying force, by virtue of its ability to bring all parties to the table and to look at the nation’s transportation system as a whole—a capability that is highly valued by sponsors and other customers.

## Limitations

- Dependence on federal or federally derived funds for support of major TRB programs.

- TRB has long depended on strong, continuing support from USDOT for its core program and Cooperative Research Programs. While the ability to attract such support is a strength, this dependence also subjects the Board to considerable uncertainty, particularly in the current fiscal environment, about the future scale and direction of the federal surface transportation program, as well as about the status of State Planning and Research (SP&R) funding.
- Uneven participation by transportation groups and constituencies.
  - Ties to government and universities traditionally have been stronger than ties to the private sector. Universities contribute time and talent, but little financial support, to TRB.
  - Persistent underrepresentation of some stakeholder groups (e.g., carriers, shippers, the construction industry, vehicle manufacturers, and equipment suppliers) and of decision makers outside the traditional transportation community.
  - Gaps within the public and nonprofit sectors. For example, some environmental advocacy organizations and transportation agency environmental experts are represented, but few public environmental agencies below the national level are (with the notable exception of the South Coast Air Quality Management District); moreover, national-level environmental agency participation has been sporadic and has lacked the involvement of senior executives. Groups representing transportation users and beneficiaries such as environmental justice groups also are not well represented in TRB committees and activities.
  - Stronger representation of some disciplines and fields than others—for example, weak representation in the areas of vehicles and fuels, international and trade issues, and logistics).
  - Slower growth than desired in participation by women and members of historically underrepresented minority groups in leadership roles and in some TRB activities.
  - Perception that TRB is not “balanced” can affect its credibility and the willingness of some individuals and groups to participate in TRB activities.

- An organizational structure and institutional ties that limit TRB’s flexibility and ability to change, and that may result in higher costs for some activities than other types of organizations are able to pay.
  - The bottom-up standing committee structure tends to reinforce the status quo, or at least make the pace of change proceed slowly. The large number of narrowly focused committees may be an issue in this regard.
  - NRC and National Academies policies and procedures limit TRB’s flexibility and the speed with which it can initiate new programs, services, or projects.
  - The structure of the Board’s financial support gives TRB limited scope to initiate new programs, projects, or services within budgets.
  - TRB’s indirect cost rates, set by its parent institution, are perceived as high.
  - The decline in federal funding has reduced the size of NRC programs, putting stress on the institution’s indirect budget and reducing the amount of indirect funding that is returned to TRB.
- TRB lacks an adequate institutional structure to conduct collaborative research, especially internationally.
- Like many other organizations, TRB is challenged to keep up with rapidly changing technologies and the expectations that they create.
- Constraints on the ability to respond quickly to requests for policy and technical advice and information.
  - It is generally perceived that TRB policy studies are slow and costly, although a range of options exists to respond to the needs of sponsors. A typical 18- to 24-month policy study costs \$500,000 or more depending on the complexity of the subject. On occasion, major studies are conducted in one year or less, but this places unusual demands on volunteers and staff. TRB also offers a faster turnaround on less complex topics, such as expert reviews of plans, reports, and research programs; this option can cost less than \$200,000 and can deliver advice in a matter of months. Nonetheless, certain NRC processes cannot be compromised, and these processes require time. Projects cannot be undertaken without the careful consideration and approval of the institution. Great care is taken in forming committees that are balanced in terms of

perspectives and free of conflicts of interest. In addition, projects involving NRC committees that provide advice to the government must comply with the Federal Advisory Committee Act Amendments that apply to NRC. All NRC reports are subject to institutional requirements for report review.

- Although praised for its strong involvement of the users of the research, the project panel process of the Cooperative Research Programs increases the time for the development and delivery of research findings.
- The traditional emphasis of the Annual Meeting on paper sessions, which require a substantial lead time for paper preparation, may reduce the ability to focus on issues of greatest current interest to the transportation community.
- The TRB–NRC requirements for planning conferences, combined with those for the review of products from these events, can result in long lead times from project inception to the dissemination of the knowledge.
- Many methods of distributing research results and other information are not targeted as effectively or delivered as efficiently as they could be to the relevant constituencies.
- For an organization that is a clearinghouse for research information and that issues more than 225 publications annually, getting the word out to those who need it is critical. TRB has made great strides in publicizing its products and activities, especially through its weekly electronic newsletter and its webinar series. However, some current methods of dissemination may not be effectively targeted, and changes in format for the delivery of some products could improve their accessibility.
  - Despite the increasing reliance on products published in electronic format, TRB’s publishing and distribution processes are still largely driven by the printed versions.
  - The two-month window for submitting papers for consideration for publication in TRB’s peer-reviewed journal, the *Transportation Research Record*, can delay the dissemination of authors’ research results if they choose to publish through TRB.
  - TRB continues to rely on non-digital media for consultant proposals and topic panel nominations
- Lingering 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. This image has an impact on the ability of the organization to attract the participation of nontraditional stakeholder groups such as nongovernmental organizations, and community and other user groups.

## **Challenges and Threats**

### ***Possible Loss of Relevance***

One of the major threats TRB faces is reduced relevancy. As long as TRB remains relevant to the needs of its sponsors and constituencies, it is more likely to enjoy their participation and support—barring events and contingencies beyond their control. This goes to the heart of the strategic planning process and is linked to several points in this analysis. 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 assess and 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 try to be “all things to all people.” TRB must keep senior management at sponsoring organizations informed about and engaged with TRB and must continue to communicate the availability of its programs to current and potential customers and sponsors effectively and proactively.

The diversity of TRB’s work and its constituencies results in tensions between different aspects of its mission—such as 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.

The diversity of TRB’s constituencies is reflected also in differing perceptions of the primary mission and content of its peer-reviewed journal, the *Transportation Research Record*. Those in the academic community who rely on having works published in highly ranked journals for tenure would like to see TRB take steps that could lead to significant increases in the journal’s citation

impact factor. Practitioners, on the other hand, would prefer more practice-ready papers than scholarly treatises.

### *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 that support—from one or more of these public agencies is often in doubt. Recently, there has been attrition in non-USDOT federal sponsors (the Department of Energy, the Department of Homeland Security, and NASA), and a failure to bring in new sponsors, aside from the U.S. Coast Guard. Some longtime federal sponsors also have been reducing their support for certain activities, more often as a result of congressional budgetary measures that have put pressure on agencies' discretionary budgets than because of diminished respect for TRB contributions. For example, FTA funding for TCRP dropped from \$10 million in FY 2011 to \$6.5 million in FY 2012, \$3.5 million in FY 2013, and \$3.0 million in FY 2014.

The uncertainty concerning the size and shape of future federal transportation programs, especially the scale of the surface transportation program and the status of SP&R, poses a threat to TRB, which has long depended on federal and federally derived funds for its core program and the Cooperative Research Programs. Especially in the current fiscal environment, TRB is vulnerable to the unintended consequences of congressional action or inaction, blunt across-the-board budget fixes, and other deal making.

For core support and NCHRP, TRB depends in particular on federally derived funds, which originate from the SP&R provisions of federal-aid programs for highways—these provisions may be revised in future authorizing legislation. In this way, state funds are tied to federal-aid programs, and the extent to which states would make up for reductions in their federal aid for research is debatable.

The long-term status of TCRP is uncertain. ACRP funding also is subject to the annual appropriations process and, like TCRP, must be reauthorized periodically by Congress. Both the National Cooperative Freight Research Program and the Hazardous Materials Cooperative Research Program were defunded in MAP-21; the newest of the Cooperative Research Programs, the National Cooperative Rail Research Program, has received only one year of funding to date.

TRB's financial health is tied to a large extent to public-sector interest in and support of transportation research. Despite relatively strong public-sector support for TRB in recent years, the continuing uncertainty about federal funding for transportation has resulted in almost a decade of flat funding (a decline in real terms) followed by a reduction in states' and FHWA support of TRB's core programs in 2013. There has also been a decline in the funding of congressionally requested policy studies.

Organizational changes, both in public- and private-sector organizations, may increase the uncertainty about the financial support for TRB from these groups. For example, several industry groups—such as the National Asphalt Pavement Association and the American Concrete Pavement Association—that had been sponsors of TRB withdrew because of financial concerns or other organizational issues.

### ***Competition and Redundancy***

A variety of professional organizations, university research centers, special-purpose organizations, foundations, and others convene meetings and offer research and study services similar to some of TRB's services. Although generally a healthy phenomenon—reflecting a broader scope, increased resources, and new participants in transportation research—this can mean duplication of activities, as well as increased competition for scarce dollars and for volunteers' time, including the ability to travel to meetings.

There is no clear delineation of the roles of federal agencies, vis-à-vis TRB, in transportation research. This has implications for the focus of, and potential audiences for, TRB research, as well as for funding. Without knowledge of the research that is being conducted, its scope, and its quality, there is potential both for redundancy and for critical gaps—which, if known, TRB might help fill.

### ***Increasing Information Technology Costs***

In an era of rapid developments in—and applications of—information technology (IT), failure to respond quickly to the new opportunities in electronic communication and dissemination of information could result in technological obsolescence, or at least the perception of lagging too far

behind. Accordingly, with increased demand for electronic delivery of information, TRB has devoted more staff and other resources to communications, new media, and the replacement and renewal of increasingly crucial IT systems to conduct its work more effectively. As a result, the Board has had little flexibility to support increases in the content and substance side of the house—such as adding transportation professional staff to support standing committees or new committees.

### ***Turnover of Senior Staff***

The large numbers of TRB senior staff who are nearing or at retirement age signals that there will be a significant loss of senior-level expertise and institutional memory over the next five years or so. This affords the opportunity to recruit individuals with strong industry expertise, but with diverse backgrounds and additional skills that TRB has not traditionally held. Similarly, this gives TRB the opportunity to retain high-achieving staff by integrating them into these senior positions. TRB will need to plan for and effectively manage this transition through careful succession planning and recruitment.

## **Opportunities**

### ***Continuing and Growing Demand for TRB Services***

This is a complex, transitional era in transportation, with a continuing need for the types of services TRB provides—including information dissemination and the support of research, inclusive forums for policy debate, and credible institutions for the conduct of special studies and policy recommendations. TRB will need to find cost-effective ways to deal with the resounding demand for more—for example, accommodating more Annual Meeting attendees, sessions, and paper submittals; holding more webinars; and conducting more fast-track studies.

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 abroad, with technical advice and information resources, as well as through collaborative partnerships with research institutions in other countries. The EU-U.S. transportation research symposium series is a promising start.

There is interest in some developing countries, such as China and India, in establishing a TRB-like entity.

There is continuing interest in extending the Cooperative Research Programs model to a variety of areas with limited research capability of their own.

### ***New Information Technologies to Improve TRB's Delivery of Products and Services***

Applications of new IT—including videoconferencing, social networking, mobile devices and smartphones, and Internet applications such as webinars—have led to faster, less expensive, and more customer-oriented ways of delivering TRB products and services. The Board has made significant progress in these areas, but the pace of change is swift, and the level of user expectations high. Electronic options have changed product portfolios, with implications for many aspects of TRB's operations, financing strategies, and interface with customers and constituents. (See the related section under Challenges and Threats.)

Continuing to develop and promote electronic substitutes for meetings will be important, particularly in light of current government restrictions on employee travel and public perceptions of government officials' participation in professional meetings. The benefits of virtual meetings, however, need to be balanced against the opportunities for informal interchange and networking that face-to-face meetings provide and that participants value.

### ***Opportunities to Expand TRB's Constituencies and Financial Support***

TRB may have an opportunity to broaden its constituencies and financial support by attracting additional private-sector participation, as appropriate to TRB's mission and to NRC guidelines. TRB should revisit the financial thresholds for sponsorship and sustaining affiliate status, and rethink the one-size-fits-all structure of its affiliate program, which has failed to yield new sources of financial support in recent years. More aggressive outreach likely will be needed to identify, attract, and retain new sources of financial support, particularly for TRB core programs.

The scheduled move of the TRB Annual Meeting to the Walter E. Washington Convention Center in Washington, D.C., in 2015 will provide a new opportunities to enhance participation in and revenues from this central TRB event; these opportunities should be explored and evaluated.

***Potential to Capitalize on TRB's Talent Pool to Identify New, Cutting-Edge Opportunities for Intellectual Investigation***

To remain current and relevant, TRB should tap its pool of talented volunteer experts, as well as other NRC volunteer experts, to seek out new intellectual opportunities that emerge, including opportunities to extend investigations beyond the traditional set of transportation-related fields and disciplines.

## Appendix C. Gap Analysis

Through the assessment of TRB's performance and with input from stakeholder groups, the strategic planning process seeks to identify major gaps that need to be addressed 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, resources, and processes. A gap can be defined as an area in which improvement or expansion is needed 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 the following questions. Which groups should be involved in TRB that are not currently engaged? What disciplines, subject areas, and issue perspectives are missing or underrepresented in the TRB portfolio? What changes should be made to the current array of services and products that the Board provides or to the marketing and delivery of those services and products? Are some services and products no longer needed, or could they be replaced with more cost-effective alternatives? What resources are needed to support and enhance current services, and what resources would be needed to augment them? How might TRB generate these resources?

Groups that have been historically difficult for TRB to attract and to engage include shippers, private-sector suppliers and contractors, manufacturers, transportation and nontransportation agencies at the local level, nontransportation agencies at the state level (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. Recent experience involving non-USDOT federal agencies has been mixed. Strategies for collaborative involvement on individual projects may be a good entrée for some of the federal non-USDOT agencies that are not currently engaged.

Also missing are certain disciplines, subject areas, and issue perspectives. For example, with the growing integration of transportation and logistics, it may make sense for TRB to try to engage the



logistics industry and its associated research community more fully. More systematic outreach to 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. One possibility might be to pilot and seek continuing funding for a roundtable to engage logistics professionals and public and private service providers—constituencies that depend on each other but do not frequently mix. Similar efforts may be needed in the areas of telecommunications and electronic communications, as the relationship between these areas and transportation continues to evolve.

One area that appears to be benefiting from greater attention is the international community interested in transportation. International participation in the Annual Meeting and other activities is substantial and growing, and TRB's international presence is being enhanced by collaboration (an example is the collaboration with the European Commission to cosponsor a series of four international research symposia) and partnering with foreign research institutions (as in the signing of memoranda of understanding with several organizations outside of the United States). If pursuing this approach more systematically in the future, TRB could stress the benefits to sponsors, 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 effort, and one that also needs to be addressed proactively 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, along with enhancing the means by which the Board markets and delivers its products. One area in which significant strides have been made but more remains to be done is taking full advantage of electronic tools for faster and more targeted delivery of reports, and improved marketing of TRB products and services. Many comments have addressed the perceived need to do a better job at selling TRB, perhaps simply by doing better at informing target communities about who we are and what we do that can benefit those

communities. This challenge is perhaps more difficult for a research-oriented organization, in that research typically has many advocates but few champions.

Short-term disruptions to federal funding in previous years forced TRB to undertake some immediate revenue-enhancing measures, such as raising Annual Meeting and conference registration fees, as well as some cost-cutting measures affecting the frequency, distribution, or scope of TRB services and products. These measures, although painful, were deemed necessary to preserve the content of programs that have traditionally been the core of TRB. Given the increasingly uncertain long-term prospects for federal funding, a key part of the gap analysis in this strategic planning cycle must be to identify ways to strengthen and diversify revenue streams to augment current funding and provide continuing support for TRB core programs.

In addition, as noted by the NRC Governing Board's Committee for the Triennial Review of TRB, TRB needs to develop better, more comprehensive metrics for measuring the impacts of TRB products and services, including the results of TRB-managed research.

## **Appendix D. Critical Issues in Transportation: 2013**

As mentioned in the introduction, TRB's [\*Critical Issues in Transportation: 2013\*](#) was one of the primary resources for the development of this TRB Strategic Plan.

TRB's Executive Committee periodically identifies a set of critical issues in transportation with likely impact on the nation's economy and quality of life. The discussion of the critical issues is intended to facilitate debate and to encourage research leading to their resolution.

Previous editions of *Critical Issues in Transportation* have highlighted many of the issues that threaten the performance of the nation's transportation system. In recent years, the Executive Committee has added the need to respond to natural disasters; highlighted transportation's links to issues in society and in the economy; and drawn attention to the role of transportation in energy and environmental issues.

*Critical Issues in Transportation: 2013* is designed to stimulate awareness and debate and to focus research on the following issues:

- The performance of the transportation system is neither reliable nor resilient, yet transportation's role in economic revival and in global economic competition has never been more important.
- The nation suffers significant, avoidable deaths and injuries every year, although safety has improved markedly.
- Although essential in meeting economic and social goals, transportation exerts large-scale, unsustainable impacts on energy, the environment, and climate.
- Inadequate funding sources for public infrastructure impede the performance and safety of the transportation system, but alternative sources of funding may place a larger financial burden on users who are least able to pay.
- Although the United States is known for its creativity and its problem solving, innovation in passenger mobility services and in public-sector infrastructure lags far behind that in the private sector.

- The research and development investment necessary for finding and adopting new solutions is low and declining.

Additional details can be found in the [full document](#).

**Appendix E. TRB Triennial Review by the NRC Governing Board: 2013**

A visiting committee appointed by the NRC Governing Board completed a triennial review of TRB in 2013. The visiting committee’s report and recommendations were accepted by the NRC in May 2013. This strategic plan has incorporated the recommendations into the strategies and action items, as shown in the table below.

<b>NRC Triennial Review Recommendations</b>	<b>TRB Strategic Plan Strategies and Action Items</b>
<p>Succession planning for senior leadership positions appears to be neither urgent nor (at this stage) well planned. The TRB is a unique organization, and promotions at the very senior level are best made internally. Succession planning should be addressed.</p>	<p>Action Item 7.c.: Develop and employ succession plans and scenarios for senior leadership positions, including training in administration and leadership.</p>
<p>The TRB should be proactive in seeking out and including more National Academy members in TRB activities, particularly in policy study venues, with emphasis on attracting NA member volunteers who are expert in technologies that will deliver future functionality in the transportation sector. The challenge extends beyond finding the useful expertise among National Academy members to advance TRB activities to making the breadth and depth of TRB activities more visible to academy membership.</p>	<ul style="list-style-type: none"> <li>• Action Item 1.c.: Involve other NRC units to help identify and address these issues.</li> <li>• Action Item 2.f: Proactively pursue avenues to involve other units of the NRC in TRB programs and activities and to provide other NRC units with a better understanding of TRB activities. Such avenues may include presentations by other NRC units at the TRB Annual Meeting, participation by staff from these units in a broader variety of TRB activities, and reimbursing these units for time spent on TRB activities.</li> </ul>
<p>The Publication Board for the <i>Transportation Research Record</i> should continue to evaluate and evolve the journal by benchmarking it against competing journals, increasing rankings, increasing citation ratings, perhaps transitioning to an all-electronic journal, and reducing the time from submission to publication. The almost 1.5 years elapsed time from submission to publication of papers in the <i>TRR</i> reduces the attractiveness of the <i>TRR</i> particularly for university authors. Publication times could be reduced for an electronic journal.</p>	<ul style="list-style-type: none"> <li>• Action Item 3.c: Conduct evaluations of the value, quality, and timeliness of TRB legacy publications such as the <i>Transportation Research Record</i>, <i>TR News</i>, conference proceedings, e-circulars, and annual reports.</li> <li>• Action Item 3.d: Continue to evaluate and evolve the <i>Transportation Research Record</i> by benchmarking it against competing journals, increasing rankings and citation ratings, perhaps transitioning to an all-electronic journal, possibly publishing separate journals by major topic or audiences, and reducing the time from submission to publication.</li> <li>• Action Item 3.e: Review TRB’s processes</li> </ul>

NRC Triennial Review Recommendations	TRB Strategic Plan Strategies and Action Items
	and timelines for paper submissions, peer reviews, and publication. Pursue opportunities for improving these processes and reducing the time from submission to dissemination.
It may be possible to accelerate the publication cycle for some papers, and to offer potential authors an outlet for important publications at any time, if there is a separate track for considering papers submitted outside the normal annual meeting process. This would mean that the TRR would consider not only papers submitted at the annual meeting, as it does now, but also papers that are submitted at any time. This latter, new category might require appointing an editor-in-chief for at least that portion. The recommendation to consider this off-annual-meeting-cycle potential for publication could make the TRR an even stronger overall publication and should be considered.	See above.
The TRB should revise and update a strategic communications plan to consider ways to communicate more effectively to promote better cross-fertilization of ideas across the TRB units and ways to communicate more effectively with other NRC and NA units, especially to encourage “TRB outsiders” to become more engaged in the activities of the TRB. Consideration should be given to reduced reliance on print media, more reliance on electronic dissemination, and increased use of social media.	<ul style="list-style-type: none"> <li>• Strategy 2: Take steps to involve a broader cross section of stakeholders and constituencies in TRB programs and activities.</li> <li>• Strategy 6: Develop and implement coordinated approaches to communicate information on TRB activities and products that address emerging and critical issues.</li> <li>• Action Item 6.c: Take steps to accommodate the increasing reliance on electronic communications and social media versus printed publications.</li> <li>• Action Item 6.e: Produce easy-to-understand communications that provide overviews of TRB and its programs and activities.</li> </ul>
TRB research programs would be well served by sharper and more comprehensive tracking of the <i>impacts</i> of the research.	<ul style="list-style-type: none"> <li>• Strategy 4: Apply more systematic approaches for identifying and tracking the impacts of TRB’s research programs.</li> <li>• Action Item 4.a: Conduct periodic stakeholder surveys for each major TRB program to solicit feedback on, and</li> </ul>

<p align="center"><b>NRC Triennial Review Recommendations</b></p>	<p align="center"><b>TRB Strategic Plan Strategies and Action Items</b></p>
	<p>examples of, the impacts of these programs.</p> <ul style="list-style-type: none"> <li>• Action Item 4.b: Expand upon existing efforts such as the Research Pays Off series, Key Research Achievements database, the NCHRP annual “Sweet 16,” and the ACRP Impacts on Practice.</li> <li>• Action Item 4.c: Augment existing programs such as the annual TRB–State DOT partnership visits and the ACRP Ambassadors Program to solicit specific information on the impacts of TRB’s research activities.</li> <li>• Action Item 4.d: Request committees that receive an annual allocation of Cooperative Research Programs funds to report on the benefits that have been achieved from previous funded projects.</li> <li>• Action Item 4.e: Implement a strategic approach to communicate the impacts of TRB research programs to TRB stakeholders and to decision makers.</li> </ul>
<p>The TRB and the National Academies should both rationalize their information infrastructures, and not treat them as a collection of applications chosen with little regard to one another and how the overall information service is being delivered. Both should consider how to change the culture and the business practices to make greater use of IT tools to improve efficiency and effectiveness of staff and volunteers. It would be advisable for the NRC to consider what portions of the information infrastructure should be common, shared and/or standardized across all its units.</p>	<p>Action Item 7.a: Work with the NRC to rationalize the software and information infrastructure, considering what portions should be common, shared, and standardized</p>
<p>The TRB should pursue its adoption of the Aptify volunteer engagement management application, exercising discipline over adaptations of it so as to emerge with a best-of-breed system that supports modern business practices. NRC decision makers should observe, without deterring implementation, the TRB adoption of a modern volunteer engagement support system, and consider if that</p>	<p>Action Item 7.b: Implement and advance software applications for volunteer engagement management, and for paper review and Annual Meeting planning. Exercise discipline to emerge with a best-of-breed system that supports modern business practices.</p>

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system can be used more broadly.	