The **National Academy of Sciences** was established in 1863 by an Act of Congress, signed by President Lincoln, as a private, nongovernmental institution to advise the nation on issues related to science and technology. Members are elected by their peers for outstanding contributions to research. Dr. Marcia McNutt is president.

The **National Academy of Engineering** was established in 1964 under the charter of the National Academy of Sciences to bring the practices of engineering to advising the nation. Members are elected by their peers for extraordinary contributions to engineering. Dr. C. D. Mote, Jr., is president.

The **National Academy of Medicine** (formerly the Institute of Medicine) was established in 1970 under the charter of the National Academy of Sciences to advise the nation on medical and health issues. Members are elected by their peers for distinguished contributions to medicine and health. Dr. Victor J. Dzau is president.

The three Academies work together as the National Academies of Sciences, Engineering, and Medicine to provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions. The Academies also encourage education and research, recognize outstanding contributions to knowledge, and increase public understanding in matters of science, engineering, and medicine.


The **Transportation Research Board** is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. 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. The Board’s varied committees, task forces, and panels annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

Learn more about the Transportation Research Board at [www.TRB.org](http://www.TRB.org).
A major program division of the National Academies of Sciences, Engineering, and Medicine, the Transportation Research Board (TRB) is recognized as one of the world’s leading transportation research organizations. TRB is perhaps best known for its Annual Meeting held each January in Washington, D.C.; the 2016 meeting—TRB’s 95th—attracted a record 12,500 attendees. TRB also is known for its other convening activities, such as workshops, conferences, symposia, webinars, and committee meetings.

In addition, TRB supports the conduct of research through its Cooperative Research Programs; the publication of research through the Transportation Research Record: Journal of the Transportation Research Board and other publications; presentation of research results through its convening activities; and the cataloguing of research through the Transportation Research Information Documentation—or TRID—database, which contains more than 1.1 million entries of published transportation research. TRB also produces highly respected and influential policy studies, which provide advice to the nation on important and complex policy issues.

**Organization**

The National Academies of Sciences, Engineering, and Medicine honor the foremost scientists, engineers, and medical professionals in the nation; members of the National Academies are called on to provide evidence-based policy advice on issues related to science, engineering, and medicine. Known for its standards of objectivity, the expertise it is able to assemble, and the rigorous review process for its reports and recommendations, TRB’s parent institution provides advice to Congress, the Administration, and other policy makers for the development of legislation, regulations, and implementation plans.

As one of seven program divisions, TRB benefits tremendously from the Academies’ expertise and credibility. TRB’s collaborations with other parts of the Academies continue to increase.
TRB relies on the knowledge and service of volunteers who are experts in all subjects related to transportation. More than 7,000 volunteers participate on TRB committees and research panels. The TRB Executive Committee, with 26 appointed members and 20 ex officio members, provides strategic direction and oversight for the Board’s activities. Executive Committee members come from organizations representing government, academia, and private-sector companies and all modes of transportation.

TRB’s more than 200 standing committees cover all modes and related subject areas. The Technical Activities Council provides oversight for these committees; the Council consists of the chairs of the 11 topical groups of committees. Each committee comprises approximately 30 to 35 members, with additional volunteers on its friends list. The committees organize Annual Meeting and conference sessions, review approximately 6,000 papers submitted for presentation at the annual meeting and for publication in the journal, develop research problem statements for consideration by the Cooperative Research Programs and other research organizations, and serve as communities of practice for experts in their respective subject areas. TRB’s Technical Activities Division staff supports the work of the standing committees.

TRB’s policy studies assemble the foremost experts in the topics to be addressed. Policy study committees are constituted to balance expertise and perspectives, to ensure objectivity, and to avoid conflicts of interest. The hard work, dedication, commitment, and expertise of its volunteers have enabled TRB to produce key policy studies. TRB’s Studies and Special Programs Division provides staff support.

Almost 2,000 volunteers serve on panels for TRB’s Cooperative Research Programs. Each program manages contracted research to develop products useful to practitioners who manage and operate transportation systems. Each program has an oversight committee that selects projects, and each project has a panel of experts who provide direction, oversight, and review of the contracted research. TRB’s Cooperative Research Programs Division supplies staff support for these activities.

TRB’s Executive Office provides strategic direction and oversight of staff, as well as a variety of administrative, publication, communications, and information technology functions.

TRB’s 2016 budget was $88 million. With the number of volunteers involved in TRB, the logistics required to support convening activities, the amount of contracted research undertaken, the number of sponsors providing financial support, and the number of special studies, the management of TRB’s finances is a complex task. TRB’s Administration and Finance Division handles these assignments.

For a summary of key accomplishments by each of these organizational units in 2016 and for detailed reports, see the full version of the TRB 2016 Annual Report.
STRATEGIC INITIATIVES

In June 2014, the TRB Executive Committee adopted a five-year strategic plan to guide TRB volunteers and staff on several initiatives. To ensure a focus on the most important current and future issues, the Executive Committee identified three strategic areas for TRB programs and activities in the next few years. These emerging topics affect all modes and sectors of transportation. The oversight committees of each TRB division are charged with identifying ways to advance the state of knowledge and the state of practice in the three strategic areas.

Transformational Technologies

Advances in technology have the potential to change fundamentally the way that transportation services are provided and to improve safety, mobility, and sustainability significantly. TRB continues to convene experts and to manage research in the areas of connected and automated vehicles, which have the potential to reduce significantly the number of crashes caused by human error and to improve system efficiency.

Technology-enabled mobility services are altering the way that people travel, particularly in metropolitan areas; with automated vehicles, these services may change the automobile ownership model in the United States and worldwide. Unmanned aerial systems can change freight delivery. These services and the capture, processing, and availability of data from sensors throughout the transportation system can change the use of real-time information to inform travel decisions and to manage the system efficiently.

Smart transportation, as part of the concept of smart cities, can significantly improve the quality of transportation services and the quality of life. TRB is at the forefront of sharing state-of-the-practice information and managing research on issues associated with these transformational technologies.

Resilience

The transportation system increasingly faces disruptions from natural or man-made disasters. Severe weather events have become more frequent and have closed down or adversely affected the operation of the transportation system. Terrorists have targeted physical and cyber elements of the system and have severely disrupted the mobility of passengers and freight.

Planning for natural and man-made disruptions, identifying ways to manage during the disruptions, and recovering from the disruptions as quickly as possible have become priorities for transportation system owners and operators. TRB is convening meetings and conducting research activities related to resilience. An Executive Committee task force has identified a strategic plan for addressing these issues in a coordinated manner.

Public Health and Transportation

Public health is an important societal goal that transportation can and should help support. Some of the many ways that transportation can
review process—from the initial calls for papers through submission, review, and acceptance—to identify efficiencies and to ensure that only high-quality articles are accepted for publication.

Cooperative Research Programs
At the request of sponsors and stakeholders, the Cooperative Research Programs have set a priority to reduce the time from the initial submission of problem statements to the availability of research results and reports. The programs’ oversight committees and staff have undertaken process reviews and have identified opportunities to perform steps in parallel instead of in linear sequence, particularly during project selection and contracting. Also identified were ways to undertake more high-priority research through open-ended task order contracts, reducing the time required for procurement.

Several Cooperative Research Programs projects are making reports available online after acceptance by peer review, before the final editing; this makes research results and products available three to six months before the publication of the final edited report.

The Cooperative Research Programs are developing research road maps for select priority areas. This will ensure a more strategic approach to identify priority research and to address important areas that may not surface through the more traditional problem statements.

A major focus is the implementation of research results. This includes the pilot testing of usable products and increased dissemination activities to promote stakeholder awareness and understanding of the research products’ benefits.

REVIEW OF LEGACY PROGRAMS
Each of TRB’s oversight committees regularly reviews TRB’s legacy programs to identify opportunities to address feedback received from sponsors and stakeholders and to identify improvements in processes and in the timeliness and quality of the products and services delivered. TRB’s strategic plan identified several areas for focus.

Transportation Research Record
A group of experts from peer journals reviewed the TRB editorial and production processes for articles after acceptance to the Transportation Research Record by TRB’s standing committees. Applying recommendations from this peer review, TRB has developed an implementation plan to enable earlier online availability of journal articles. In addition, the earlier assignment of digital object identifiers for articles should help increase the citation impact factor for TRB’s journal. A special task force is examining the entire peer review process—from the initial calls for papers through submission, review, and acceptance—to identify efficiencies and to ensure that only high-quality articles are accepted for publication.

STRENGTHENING FINANCES
TRB improved its financial outlook significantly in 2016. To draw down the reserves for core programs from levels that were higher than targeted, TRB had operated under a budget deficit for the past several years, but this was not sustainable. At the same time, TRB had faced uncertainty about its long-term revenues without long-term authorization legislation for surface transportation.

The five-year Fixing America’s Surface Transportation (FAST) Act, passed in December 2015, offers greater certainty about revenues from federal sources and enables long-term financial planning. The largest share of revenues for TRB’s Technical Activities and Cooperative Re-
Board. TRB also relies on annual meeting registration fees, exhibits, and patrons as a source of revenue, and these continue to increase each year.

TRB is looking for opportunities to diversify and increase its revenue sources. The TRB Executive Committee’s New Revenues Task Force is exploring opportunities to attract new support from the public and private sectors. TRB launched a planned giving program in 2016 that enables individuals to support TRB activities through bequests or other contributions.

TRB’s 2016 financial statement is shown on pages 8–9.

DIVERSIFYING PARTICIPATION

The more than 7,000 volunteer participants on TRB committees and panels represent a diverse array of transportation community sectors and disciplines. It is critical that TRB reflect changes as the transportation community evolves and diversifies. TRB therefore has focused on expanding participation from underrepresented sectors, particularly among new technology firms; diversifying participation by gender, race, and young professionals; pursuing a more strategic approach to international activities; and partnering with other transportation professional organizations.

Technology innovations are disrupting the way that transportation services are provided, and TRB has recognized that transportation is attracting the involvement of many new actors from the technology sector. TRB proactively has sought to
TRB’s new communications materials include a brochure describing its mission.

Involving participants from technology firms in activities, as well as to identify research needs. For example, attendance at TRB’s automated vehicles conference has grown to more than 1,200, and many of the participants had no previous involvement in TRB activities. A TRB symposium in fall 2016 identified research needs across the range of transformational technologies. TRB is partnering with other organizations interested in transformational technologies in transportation.

During 2016, TRB developed and adopted a management plan for diversity and inclusion, identifying strategies to engage a diverse, inclusive pool of stakeholders representative of the community that TRB serves. TRB is continuing its focus on increasing the gender, racial, and age diversity of its committees and panels. Staff have partnered with leaders at organizations that serve female, minority, and young transportation professionals, to engage their members in TRB activities. In 2016, the TRB Minority Fellows Program nearly doubled the number of students who received financial assistance to attend the TRB Annual Meeting from historically minority-serving colleges and universities.

An Executive Committee task force reviewed TRB’s international activities and recommended an approach to increase international participation related to strategic initiatives. For example, a joint symposium with the European Union and U.S. DOT addressed the subject of climate change adaptation, part of TRB’s strategic focus on resilience. Similarly, a new memorandum of understanding will improve the sharing of information and resources between the World Road Association and TRB.

TRB is actively working to partner with other transportation organizations to identify areas of common interest and potential joint activities. These partnerships can increase the participation by members of these organizations in TRB.

MEASURING THE IMPACTS

The TRB strategic plan called for more systematic approaches to identify and track the impacts of TRB activities. In 2016, the National Cooperative Highway Research Program (NCHRP) established the staff position of Implementation Coordinator, and the Airport Cooperative Research Program (ACRP) has hired a contractor to track the impacts of research products. NCHRP, ACRP, and the Transit Cooperative Research Program have conducted periodic surveys to collect information on the use of their research. Committees receiving a regular allocation of Cooperative Research Programs funds now must report annually on the benefits from previously funded projects.

Working with the National Academies, TRB is employing new tools and databases for tracking the impacts of products. Information about who is using the products, about how the products are being used, and the comments about the products are more readily available than ever before. In the
past year, TRB started tracking references to TRB products in federal and state legislation, regulations, and standards, and in testimony delivered before Congress.

The information is providing a better understanding of TRB’s regional, national, and global influence and demonstrates the value of the products to stakeholders. The feedback will help TRB to enhance the value and quality of its services and products continuously.

COMMUNICATING ABOUT PROGRAMS AND ACTIVITIES

Current and potential stakeholders are not always well acquainted with the extent of TRB’s diverse portfolio of products and services. TRB therefore adopted a communications and marketing plan to guide efforts to increase awareness and knowledge of TRB products and services within the transportation professional community.

The first step was the development and distribution of a new brochure, a video, and a PowerPoint presentation. TRB staff and volunteers have used these communications materials at outreach events, including conferences and the annual meetings of partner organizations. TRB collected feedback from readers about its e-newsletter, and work began on redesigning the TRB.org homepage.

TRB’s popular webinar series has continued to grow and has proved an effective means of increasing stakeholder awareness of TRB reports and current issues in transportation. TRB has started webcasting selected conferences, enabling those who cannot attend in person to participate remotely.

TRB is committed to meeting the needs of its stakeholders. Feedback and suggestions are welcome—go to the TRB Message Center online: www.trb.org/Contact/GeneralQuestions.aspx, or call 202-334-2934.
### Core Technical Activities

<table>
<thead>
<tr>
<th>Source</th>
<th>2015 (Actual)</th>
<th>2016 (Projected)*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State Highway and Transportation Departments (State DOTs)</strong></td>
<td>$6,973,000</td>
<td>$7,140,000</td>
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<tr>
<td><strong>Federal Government</strong></td>
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<tr>
<td>Federal Highway Administration (FHWA)</td>
<td>1,900,000</td>
<td>1,675,000</td>
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<tr>
<td>Office of the Assistant Secretary of Transportation for Research and Technology (OST-R)</td>
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<td>300,000</td>
</tr>
<tr>
<td>Federal Transit Administration (FTA)</td>
<td>250,000</td>
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<tr>
<td>National Highway Traffic Safety Administration</td>
<td>208,000</td>
<td>212,000</td>
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<tr>
<td>Bureau of Indian Affairs, Department of the Interior</td>
<td>80,000</td>
<td>85,000</td>
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<tr>
<td>Federal Motor Carrier Safety Administration (FMCSA)</td>
<td>75,000</td>
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<tr>
<td>Department of Energy (DOE)</td>
<td>0</td>
<td>65,000</td>
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<tr>
<td>Federal Aviation Administration (FAA)</td>
<td>65,000</td>
<td>65,000</td>
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<tr>
<td>Federal Railroad Administration (FRA)</td>
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<td>65,000</td>
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<tr>
<td>U.S. Air Force Civil Engineer Center</td>
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<tr>
<td>U.S. Army Corps of Engineers</td>
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<td><strong>Subtotal, Federal Government</strong></td>
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<td>$2,932,000</td>
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<td><strong>Other</strong></td>
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<tr>
<td>American Public Transportation Association</td>
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<tr>
<td>Association of American Railroads</td>
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<tr>
<td>South Coast Air Quality Management District, California</td>
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<td>65,000</td>
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<tr>
<td>Fees and Sales</td>
<td>5,730,000</td>
<td>5,943,000</td>
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<td><strong>Subtotal, Other</strong></td>
<td>$5,925,000</td>
<td>$6,138,000</td>
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<tr>
<td><strong>Total, Core Technical Activities</strong></td>
<td>$15,981,000</td>
<td>$16,210,000</td>
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### Marine Board Core Program

<table>
<thead>
<tr>
<th>Source</th>
<th>2015 (Actual)</th>
<th>2016 (Projected)*</th>
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</thead>
<tbody>
<tr>
<td>U.S. Coast Guard</td>
<td>75,000</td>
<td>75,000</td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers</td>
<td>75,000</td>
<td>75,000</td>
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<tr>
<td>National Oceanic and Atmospheric Administration</td>
<td>40,000</td>
<td>40,000</td>
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<tr>
<td>Bureau of Safety and Environmental Enforcement</td>
<td>30,000</td>
<td>30,000</td>
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<tr>
<td>Maritime Administration</td>
<td>19,000</td>
<td>19,000</td>
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<tr>
<td>U.S. Navy</td>
<td>12,000</td>
<td>12,000</td>
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<tr>
<td><strong>Total, Marine Board Core Program</strong></td>
<td>$251,000</td>
<td>$251,000</td>
</tr>
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</table>

### Cooperative Research Programs (CRP)

<table>
<thead>
<tr>
<th>Source</th>
<th>2015 (Actual)</th>
<th>2016 (Projected)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Cooperative Highway Research Program (State DOTs)</td>
<td>34,479,000</td>
<td>34,066,000</td>
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<tr>
<td>Airport Cooperative Research Program (FAA)</td>
<td>15,865,000</td>
<td>13,320,000</td>
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<tr>
<td>Transit Cooperative Research Program (FTA)</td>
<td>4,179,000</td>
<td>4,409,000</td>
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<tr>
<td>National Cooperative Freight Research Program (OST-R)</td>
<td>1,558,000</td>
<td>391,000</td>
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<tr>
<td>National Cooperative Rail Research Program (FRA)</td>
<td>1,529,000</td>
<td>438,000</td>
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<tr>
<td>Hazardous Materials Cooperative Research Program (Pipeline and Hazardous Materials Safety Administration)</td>
<td>258,000</td>
<td>86,000</td>
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<tr>
<td><strong>Total, Cooperative Research Programs</strong></td>
<td>$57,868,000</td>
<td>$52,710,000</td>
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</tbody>
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**Distribution of TRB Expenditures**

- **Consultants and Contracts**: 52%
- **Salaries (including fringe benefits)**: 17%
- **Indirect Costs**: 21%
- **Other Direct Costs**: 2%
- **Travel and Meetings**: 5%
- **Editing, Abstracting, and Publishing**: 3%

**TRB Funding Support**

- **State DOTs**: 52%
- **Federal**: 39%
- **Other**: 9%
### Strategic Highway Research Program 2 (SHRP 2)
- **2015 (Actual):** $4,413,000
- **2016 (Projected):** $0

### SHRP 2 Safety Data Phase 1
- **2015 (Actual):** $3,358,000
- **2016 (Projected):** $5,407,000

## Continuing Programs

### Innovations Deserving Exploratory Analysis (IDEA)
- NCHRP IDEA (State DOTs): $1,391,000 / $1,315,000
- Transit IDEA (FTA): $517,000 / $366,000
- Safety IDEA (FRA): $273,000 / $241,000

### Subtotal, IDEA Programs
- **2015 (Actual):** $2,181,000
- **2016 (Projected):** $1,922,000

### Synthesis Programs
- NCHRP Synthesis (State DOTs): $1,868,000 / $2,051,000
- ACRP Synthesis (FAA): $1,276,000 / $1,033,000
- TCRP Synthesis (FTA): $570,000 / $729,000

### Subtotal, Synthesis Programs
- **2015 (Actual):** $3,714,000
- **2016 (Projected):** $3,813,000

### Legal Programs
- NCHRP Legal (State DOTs): $453,000 / $293,000
- TCRP Legal (FTA): $106,000 / $188,000
- ACRP Legal (FAA): $6,000 / $4,000

### Subtotal, Legal Programs
- **2015 (Actual):** $565,000
- **2016 (Projected):** $485,000

## Total, Continuing Programs
- **2015 (Actual):** $6,460,000
- **2016 (Projected):** $6,220,000

## Policy Studies
- **2015 (Actual):** $3,577,000
- **2016 (Projected):** $4,033,000

## Conferences and Workshops
- **2015 (Actual):** $2,165,000
- **2016 (Projected):** $2,314,000

## TRB TOTAL
- **2015 (Actual):** $94,073,000
- **2016 (Projected):** $87,386,000

### Sources of Funds
- Federal: $41,007,000 / $33,977,000
- State DOTs: $45,164,000 / $45,106,000
- Other: $7,902,000 / $8,303,000

### Expenditures by Major Cost Category

<table>
<thead>
<tr>
<th>Category</th>
<th>2015 (Actual)</th>
<th>2016 (Projected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries (including fringe benefits)</td>
<td>$14,289,000</td>
<td>$14,926,000</td>
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<tr>
<td>Travel and Meetings</td>
<td>$5,057,000</td>
<td>$4,787,000</td>
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<tr>
<td>Editing, Abstracting, Publishing</td>
<td>$2,854,000</td>
<td>$2,299,000</td>
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<tr>
<td>Consultants and Contracts</td>
<td>$51,857,000</td>
<td>$45,546,000</td>
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<tr>
<td>Other Direct Costs</td>
<td>$2,200,000</td>
<td>$1,913,000</td>
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<tr>
<td>Indirect Costs</td>
<td>$18,845,000</td>
<td>$18,263,000</td>
</tr>
</tbody>
</table>

### Total Expenditures
- **2015 (Actual):** $95,102,000
- **2016 (Projected):** $87,734,000

### TRB Reserve Fund

<table>
<thead>
<tr>
<th>Description</th>
<th>2015 (Actual)</th>
<th>2016 (Projected)</th>
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<tbody>
<tr>
<td>Fund balance, end of previous fiscal year</td>
<td>$17,763,000</td>
<td>$16,734,000</td>
</tr>
<tr>
<td>Plus (minus) current fiscal year income over (under) expenditures</td>
<td>(1,029,000)</td>
<td>(666,000)</td>
</tr>
<tr>
<td>Balance, current fiscal year</td>
<td>$16,734,000</td>
<td>$16,068,000</td>
</tr>
</tbody>
</table>

In 1965, the TRB Executive Committee approved a reserve fund to provide for orderly adjustments in the event of a temporary shortfall in anticipated revenues for TRB Technical activities. This fund, built up over the years from surplus income in excess of expenditures from nonfederal sources for any one fiscal year, is reserved for expenditures in excess of income for any later fiscal year under a fixed budget approved triennially by the TRB Executive Committee.

*Calendar Year 2016 comprises actual data through October and estimates for the rest of the year.*