ANNUAL REPORT

1979

TRANSPORTATION RESEARCH BOARD
NATIONAL ACADEMY OF SCIENCES

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TRANSPORTATION RESEARCH BOARD
Commission on Sociotechnical Systems
National Research Council

National Academy of Sciences
Washington, D.C., 1979

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EXECUTIVE COMMITTEE AND DIRECTORS

The policies and activities of the Transportation Research Board are determined and directed by its Executive Committee, acting within the overall policies of the National Research Council. Executive Committee members are appointed by the chairman of the Commission on Sociotechnical Systems with the approval of the chairman of the National Research Council. Ten members of the Executive Committee are ex officio and 21 members are persons who are active in the areas of interest of the board and who represent government, industry, and the academic world.

EXECUTIVE COMMITTEE

Chairman

Peter G. Koltnow, President, Highway Users Federation for Safety and Mobility

Vice Chairman

Thomas D. Moreland, Commissioner and State Highway Engineer, Georgia Department of Transportation

Secretary

W. N. Carey, Jr., Executive Director, Transportation Research Board

Members

Langhorne M. Bond, Federal Aviation Administrator (ex officio)
Karl S. Bowers, Federal Highway Administrator (ex officio)
Harvey Brooks, Chairman, Commission on Sociotechnical Systems, National Research Council (ex officio)
Howard L. Gauthier, Department of Geography, Ohio State University (ex officio, Maritime Transportation Research Board)
William J. Harris, Jr., Vice President–Research and Test Department, Association of American Railroads (ex officio)
Robert N. Hunter, Chief Engineer, Missouri State Highway Department (ex officio, Past Chairman, 1977)
A. Scheffer Lang, Consultant (ex officio, Past Chairman, 1978)
Lillian C. Liburdi, Acting Deputy Urban Mass Transportation Administrator (ex officio)
Henrik E. Stafseth, Executive Director, American Association of State Highway and Transportation Officials (ex officio)
John McGrath Sullivan, Federal Railroad Administrator (ex officio)

Lawrence D. Dahms, Executive Director, Metropolitan Transportation Commission for the San Francisco Bay Area (1980)
Arthur C. Ford, Assistant Vice President–Long Range Planning, Delta Air Lines (1981)
Arthur J. Holland, Mayor, Trenton, New Jersey (1982)
Jack Kinstlinger, Executive Director, Colorado Department of Highways (1982)
Thomas J. Lamphier, President–Transportation Division, Burlington Northern, Inc. (1980)
Roger L. Mallar, Commissioner, Maine Department of Transportation (1981)
Marvin L. Manheim, Professor, Department of Civil Engineering, Massachusetts Institute of Technology (1981)
Darrell V Manning, Director, Idaho Transportation Department (1981)
Robert S. Michael, Director of Aviation, City and County of Denver (1980)
Daniel T. Murphy, County Executive, Oakland County, Michigan (1982)
Richard S. Page, General Manager, Washington Metropolitan Area Transit Authority (1981)
Philip J. Ringo, President and Chief Executive Officer, ATE Management and Services Co., Inc. (1982)
Mark D. Robeson, Chairman, Finance Committee, Yellow Freight Systems, Inc. (1982)
Douglas N. Schneider, Jr., Director, District of Columbia Department of Transportation (1980)
William K. Smith, Vice President–Transportation, General Mills, Inc. (1981)
John R. Tabb, Director, Mississippi State Highway Department (1981)
John P. Woodford, Director, Michigan Department of Transportation (1980)
Charles V. Wootan, Director, Texas Transportation Institute, Texas A&M University (1982)

EXECUTIVE DIRECTOR AND DIVISION DIRECTORS

W. N. Carey, Jr., Executive Director
E. C. Squires, Assistant Director for Administration
K. B. Johns, Assistant Director for Regular Technical Activities
P. E. Irick, Assistant Director for Special Activities
K. W. Henderson, Jr., Program Director for National Cooperative Highway Research Program

To: The Supporters of the Transportation Research Board

From: W. N. Carey, Jr., Executive Director



Fiscal year 1979 has been a very good year for TRB. The Annual Meeting was the largest ever—in number of papers accepted for presentation, in number of committee meetings, and in number of registrants. More important than numbers, though, the quality of the papers and of the interactions among the transport professionals who attended seemed substantially higher than average. During the year, 25 special conferences and workshops were held. Most were sponsored by the Urban Mass Transportation Administration (UMTA), Federal Highway Administration (FHWA), National Highway Traffic Safety Administration (NHTSA), or Federal Railroad Administration (FRA). Reports from the sponsors and from the conferees have been universally favorable.

A special effort was undertaken to catch up on the backlog of TRB material for publication. Before the 1980 Annual Meeting practically all papers given at earlier meetings, including the January 1979 meeting, will be in print. FY 1979 was the last year of a three-year fixed-subscription period for the states and FHWA. To help TRB maintain its programs and activities, despite heavy inflation, these sponsors have agreed to increase their support by 19.1 percent (6 percent per year compounded) for the next triennium (FY 1980-FY 1982).

The TRB professional staff in 1970 totaled 31. Since then we have abolished 5 positions and added 24, for a net gain of 19. These new jobs have been filled by persons who have expertise in fields that were not covered by the HRB of 1970—other modes and other disciplines. They are supported by funds from new sponsors (e.g., UMTA, FRA, the Association of American Railroads, the Federal Aviation Administration, NHTSA, the U.S. Agency for International Development, the Maritime Administration of the U.S. Department of Commerce). In FY 1979 these new agencies supported TRB in the amount of $1 412 000, which is almost equal to the total support from the state departments of transportation and highway departments ($1 553 000). The other long-time (since 1920) sponsor, FHWA, is now providing $630 000 annually (beginning in FY 1980).

The base of TRB support is therefore healthily broad. Along with financial support comes the very important participation of new professionals from the other modes and disciplines to improve the competence of TRB committees and to broaden its programs.

During 1979, the TRB proposal was finally submitted to UMTA for the long-awaited National Cooperative Transit Research Program. This program is expected to be under way in FY 1980.

I feel confident that, in FY 1980 and the years to come, TRB will continue to improve its service to the transportation community and, on behalf of the chairman and members of the Executive Committee and the staff, I thank the sponsors and associates of TRB and the thousands of participants in its committee work and programs for their continuing support.

Figure 1. Staff organization and responsibilities.

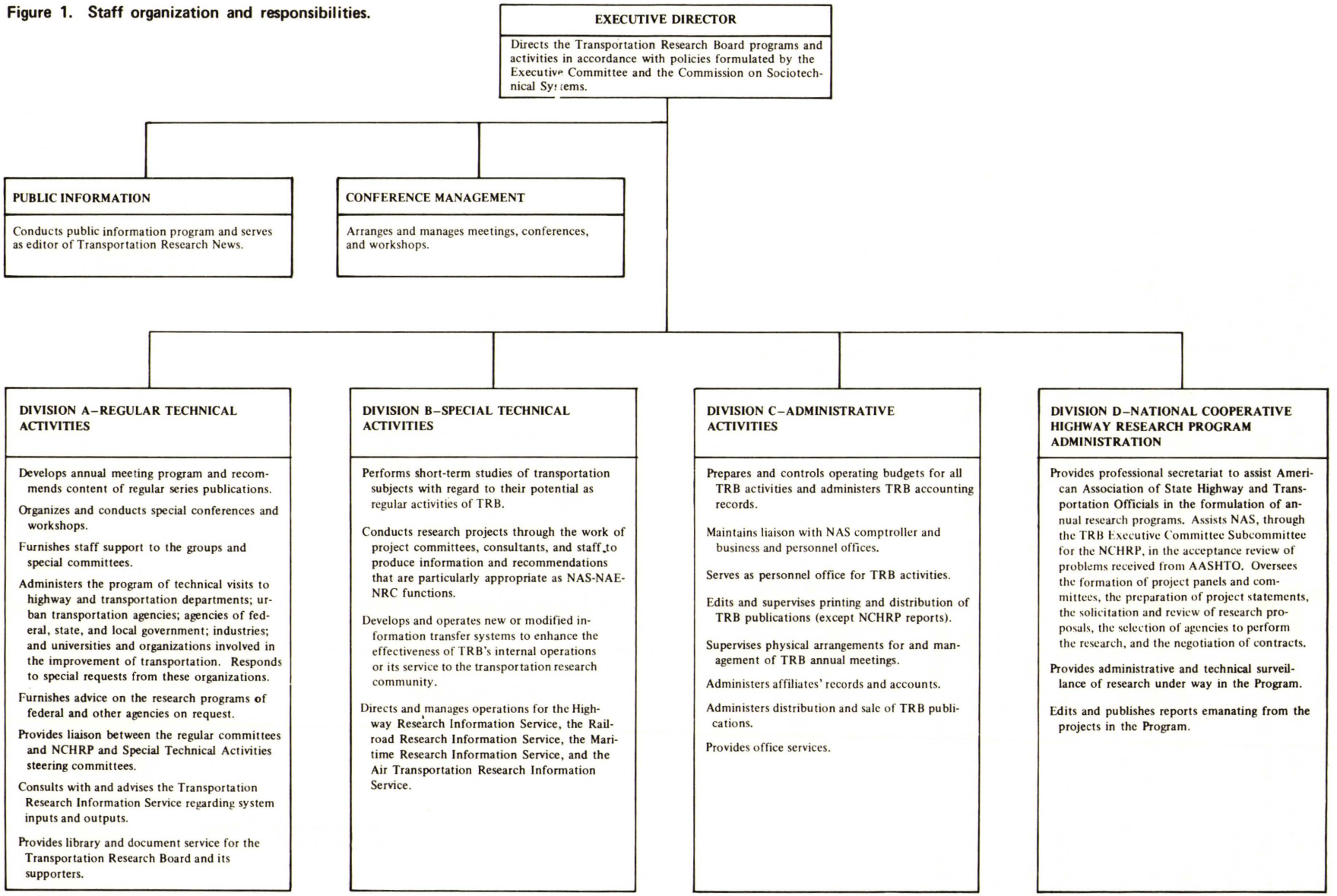
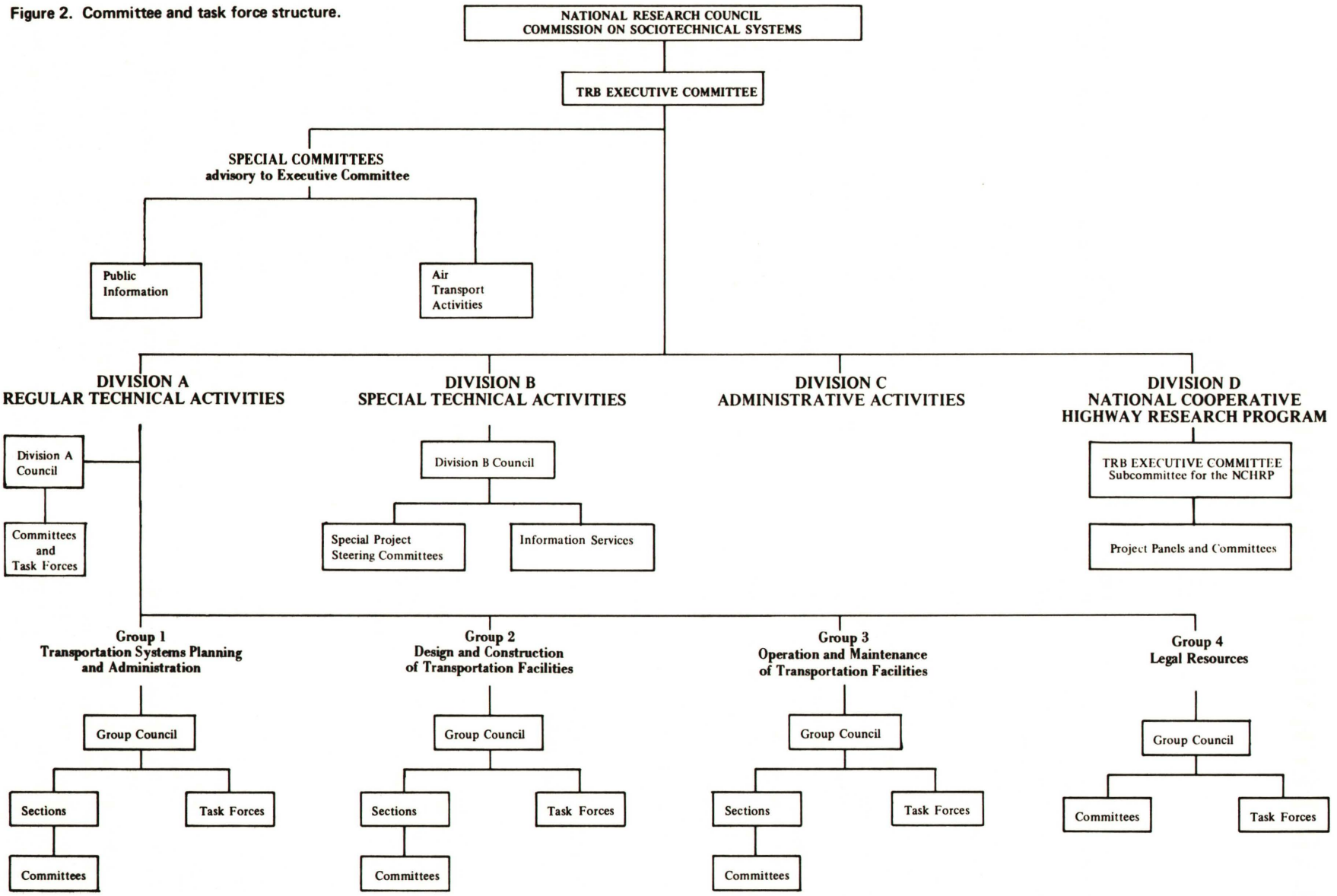


Figure 2. Committee and task force structure.



REGULAR TECHNICAL ACTIVITIES

The Division A Council continues as the coordinating element of the division, providing a focal point for the four Group Council chairmen to interact on subjects of mutual or overlapping concern. The council is chaired by Charles V. Wootan, a member of the TRB Executive Committee.

Committees currently reporting directly to the Council include the Committee on the Conduct of Research, whose membership is being revised to broaden its outreach; the Committee on Low-Volume Roads, sponsor of the Second International Conference on Low-Volume Roads, held in Ames, Iowa, August 20-23, 1979; the Committee on Inland Water Transportation; the Committee on Transportation System Management, sponsor of a national meeting on the subject in late 1979; and the Committee on Transportation Education and Training, recently organized and on its way to effective activities in support of this area.

As in the past, steering committees for conferences that deal with subjects within the scope of two or more groups are often assigned to the council. Currently, these include the Steering Committee for the Conference on Highway Safety Research, Development, and Demonstration and the Steering Committee for a Review of Rail Transport Research Needs.

GROUP 1—TRANSPORTATION SYSTEMS PLANNING AND ADMINISTRATION

Leon M. Cole, chairman

Group 1 continues its emphasis on conferences, workshops, panel meetings, and newsletters, as well as the Annual Meeting. Many activities of Group 1 involve other units of the board and are coordinated with them. The activities of Group 1 are carried out by 45 committees and task forces in six sections.

Recent or current conferences, workshops, and panel meetings have continued to reflect the changing needs in transportation. Among these have been meetings or conferences on paratransit, guidelines for highway cost allocation, social and economic aspects of automated-guideway transit, light rail transit, statewide transportation planning and programming, vertical movement in transit stations, urban transportation planning data needs and requirements, rural public transportation, railroad research priorities, and transportation of energy materials.

Conferences, workshops, and meetings are being planned to reflect several needs now emerging in transportation. The subjects include commuter and intercity bus, urban transportation finance, improving public transportation performance, the U.S. Department of Transportation's truck size and weight study, relocation and land acquisition, citizen participation, and light rail transit.

Newsletters are issued by Group 1 to meet the informational needs of those in public transportation. The newsletters are sponsored by Group 1 committees with support from the Urban Mass Transportation Administration. More specifically,

Newsline is sponsored by the Committee on Public Transportation Planning and Development. It is issued eight times a year to transmit the findings of completed research in the public transit area.

Paratransit, which was issued three times in the last year, is sponsored by the Committee on Urban Transport Service Innovations (Paratransit). It presents notices of meetings and ongoing and completed research in the area.

LRT News has been issued twice, first appearing in October 1978. It is sponsored by the Committee on Light Rail Transit. The newsletter's goal is coverage of worldwide developments in the hardware and software aspects of light rail transit, with particular regard to North America.

New Concepts in Urban Transportation, issued six times in the last year, is sponsored by the Committee on New Transportation Systems and Technology. It seeks to provide information on meetings, ongoing research, federal programs, and published works pertaining to new systems.

Land Use and Transportation, issued intermittently, is sponsored by the Committee on Joint Development of Land and Transportation Systems. This publication has specialized in joint development around transit stations; some attention is being given to development near highways.

Activities at the 58th Annual Meeting in January 1979 also reflected current concerns in transportation planning, for example, in conference sessions that lend themselves to exploring matters that affect policy. Of 94 sessions that Group 1 sponsored, 67 were conference sessions and 27 were paper sessions. The 27 paper sessions resulted from reviewing 283 papers, of which 137 were approved for presentation. The number and quality of sessions and the balance between paper and conference sessions are being reviewed by the Group 1 Council and by some sections and committees.

Coordination of Group 1 activities that relate especially to other units of the board involve standing committees, conferences or workshops, and special projects. The Committee on Transportation Education and Training includes representatives from all three groups of the board. The committee is lodged in Division A and held its initial meeting at the last Annual Meeting. A Task Force on Truck Size and Weight, lodged presently in the Social, Economic, and Environmental Factors Section, is striving to coordinate its activities with other groups. Plans are under way to form a Task Force on Transportation of Energy Materials, in the Social, Economic, and Environmental Factors Section. Coordination of this activity will include members from Groups 2 and 3 in its activities and as members of the task force.

Organizational changes under way or being considered

Figure 3. Organization of Group 1—Transportation Systems Planning and Administration.

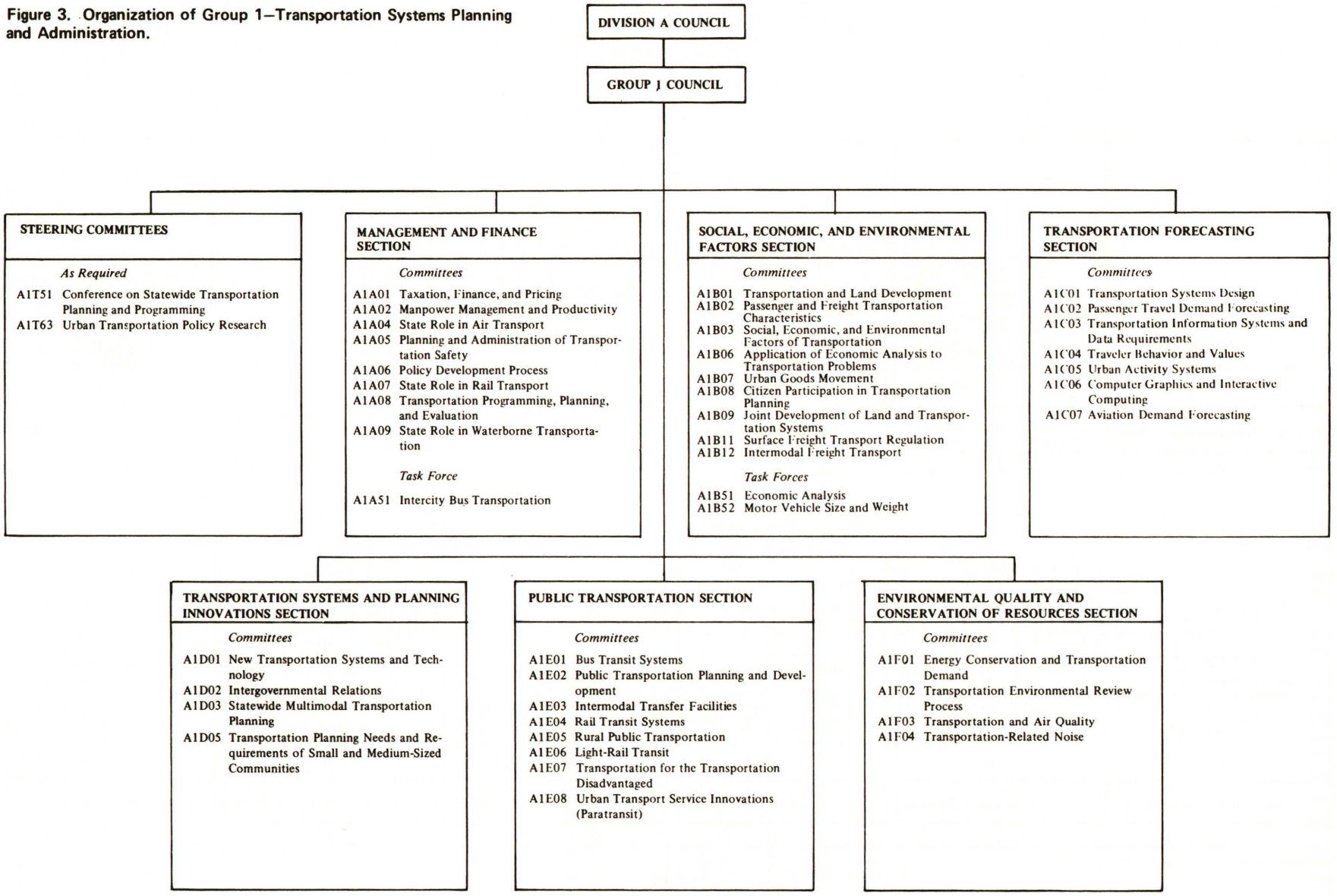
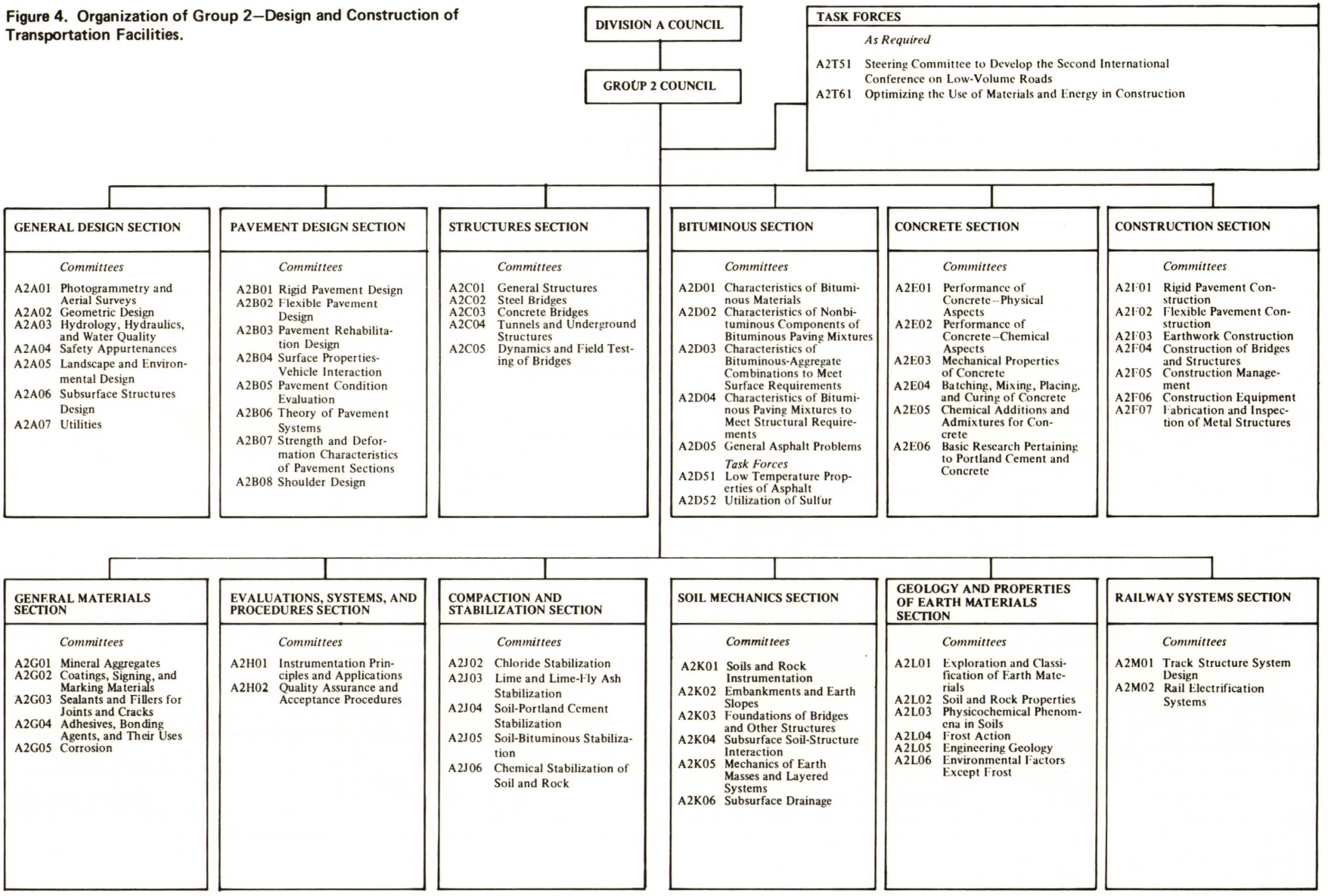


Figure 4. Organization of Group 2—Design and Construction of Transportation Facilities.



include establishing new committees and task forces to deal with emerging needs. For example, a Committee on Transportation and Land Development in Developing Countries has been proposed; two new task forces on finance, to put greater emphasis on state and local transportation finance issues, are being considered by the Management and Finance Section; finally, Group 1 issued an informational guide in December 1978. This benefited from the experience of Groups 2 and 3 with their own guides.

GROUP 2—DESIGN AND CONSTRUCTION OF TRANSPORTATION FACILITIES

Roger V. LeClerc, chairman

Group 2 consists of 64 committees organized into 12 sections, as well as several subcommittees and task forces. The Group 2 Council maintains Standing Committees on Research Needs; Paper Awards; and Organization, Scope, and Function. Organizational changes, conferences, workshops, and committee work during the year reflect the activities to address those needs in the design and construction of transportation facilities.

Organizational changes in Group 2 have included merging some committees and modifying the scope statements and names of other committees. For example, Tunnel Construction has merged with Design of Underground Transportation Structures to form a Committee on Tunnels and Underground Structures, and the Committee on Compaction has merged with the one on Earthwork Construction. Short-term organizational needs or funded projects are handled through the development of task forces or steering committees for specific tasks to be completed in a limited time. Task forces are being formed to address problems associated with tender mixtures of bituminous pavements, management of pavement rehabilitation, and maintenance investments in road networks, pavement recycling, and use of sulfur in highway pavements. Consideration is being given to creating committees or reorienting existing elements to address (a) traffic control through construction zones and (b) energy considerations in design and construction of transportation facilities.

Activities at the 58th Annual Meeting also reflect current needs and concerns in the design and construction of transportation facilities. Of the 42 technical sessions sponsored by Group 2 at the annual meeting, there were 9 symposia, 9 paper sessions, 11 mixed sessions, and 13 conference sessions. Group 2 sponsored an informal discussion (dialogue session) between key individuals in design and construction and interested novices and students in the transportation community.

Conferences or workshops held throughout the year also explored matters that affect the design and construction of transportation facilities. During the past year, self-supporting meetings and funded conferences and workshops have dealt with bridge engineering and construction management. The Bridge Engineering Conference was held in St. Louis, Missouri, to facilitate an interchange of information on all aspects of design, construction, rehabilitation, and maintenance of vehicular bridges. Specific emphasis was on problems and solutions of interest to practicing bridge engineers and administrators of highway, railroad, and transit agencies. Attendance reached 638 and the conference proceedings have been published in two Records.

Two Construction Engineering Management Workshops were held at Asilomar, California, and at Williamsburg, Virginia, to formulate a national priority program of short- and long-range research and development needs in construction engineering management. A steering committee final report summarizing the research needs and their priorities has been prepared for publication by the Federal Highway Administration.

Research needs continue to be emphasized by all elements of Group 2. In coordination with the Standing Committee on Research Needs, Circular No. 203 was prepared and distributed; it contains priority research needs statements for each section and most committees in the group. The effort to respond to emerging needs was also reflected in workshops devoted primarily to developing statements of current research needs.

During the year, Group 2 sponsored publication of 17 Transportation Research Records, 4 Transportation Research Circulars, 2 Information Series, and 2 Special Reports. Other activities included participation in the Second International Conference on Low-Volume Roads in Ames, Iowa, August 20-23, 1979. This conference facilitated a continuing exchange of information on all aspects of low-volume roads, including their planning, design, construction, operations, and maintenance. The specific problems of design of unsurfaced or lightly surfaced roads was examined closely with emphasis on the constraints of restricted funding, environmental protection, and safety requirements. The attendance was over 375, and the conference proceedings have been published in a Record.

The Committee on Geometric Design, in coordination with the Committee on Operational Effects of Geometrics in Group 3, sponsored a workshop on Resurfacing, Restoration, and Rehabilitation Projects on Existing Facilities: Improved Safety and Service, in Arlington, Texas, July 24-26, 1979. By using a case study format, the workshop sessions provided an interchange of ideas and information regarding the effectiveness of improvements made to roads and streets under resurfacing, restoration, and rehabilitation programs.

Group 2 and Groups 1 and 3 have cooperated to identify major issues involved in the surface transportation of energy materials at the Conference on Transportation of Energy Materials in Camp Hill, Pennsylvania, July 23-24, 1979.

Thirty-eight sessions are being organized for the 59th Annual Meeting; they will address the broad range of concerns in the design and construction of transportation facilities.

The 10 critical issues in transportation identified and prioritized by all elements of the Transportation Research Board are being evaluated by each section in Group 2 as to how these issues are being addressed and what should be done within the group to resolve them.

GROUP 3—OPERATION AND MAINTENANCE OF TRANSPORTATION FACILITIES

Adolf D. May, Jr., chairman

Activities of Group 3 during FY 1979 addressed many problems of pressing national concern. A variety of tech-

Figure 5. Organization of Group 3—Operation and Maintenance of Transportation Facilities.

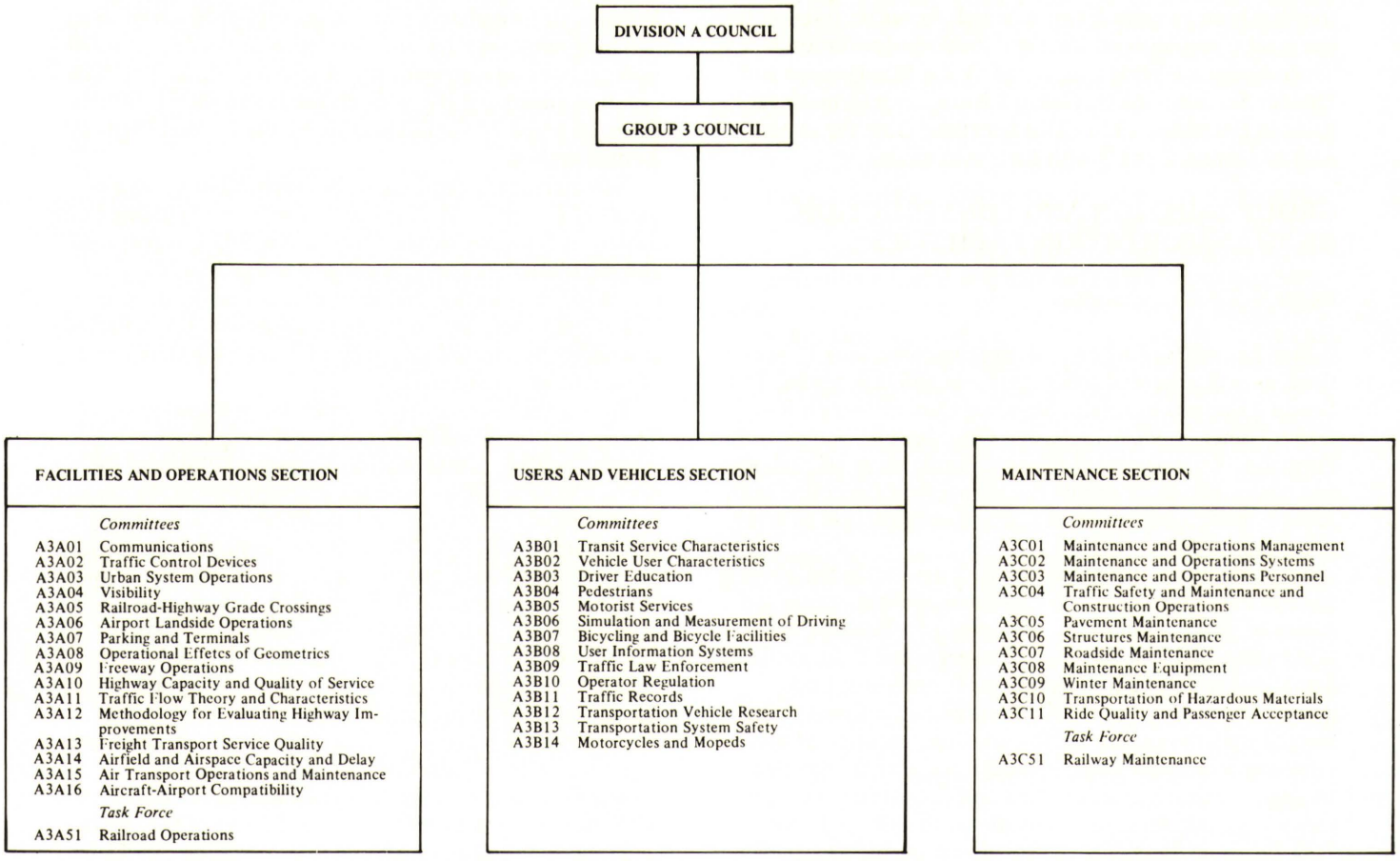
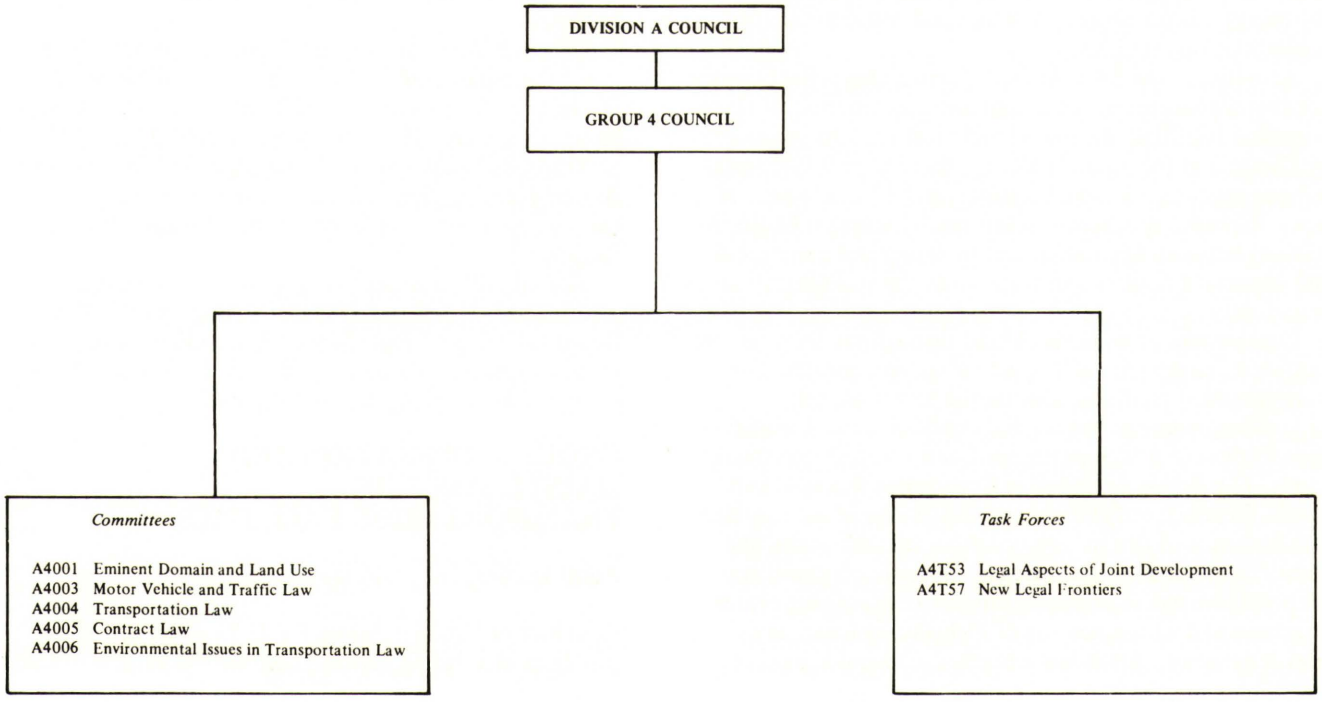


Figure 6. Organization of Group 4—Legal Resources.



niques, such as committee member and vistor interaction, reviews of projects included in the federally coordinated program of research, the 58th Annual Meeting, and special conferences and workshops, were used by the group to address the problems.

Measuring research activity and needs on the basis of audience size and interest is inappropriate, since the research community commonly identifies emerging problems and begins a search for solutions before the general body of professionals becomes concerned, but audience size and interest do indicate the existence of national problems. Substantial audiences indicate that a problem has become pervasive enough to attract research grants and a substantial involvement by researchers. On this assumption, the following subjects are singled out in this report for brief discussion: transportation system management, traffic control in work zones, and safety measures of effectiveness for evaluating highway improvements.

Transportation system management (TSM) includes both planning and operational measures to gain greater use of existing facilities; to the extent that success is obtained, safety is improved, capital investment is reduced, and energy use is reduced. Group 3 personnel are heavily involved in both the preparation for and the program of a workshop on current TSM issues to be held in November. Other significant activity in the traffic and operation area includes the contribution of one committee in the development of updated materials for a new *Highway Capacity Manual* and in the definition of needed research on this subject. Two other committees are engaged in planning conferences for early 1980 in the areas of railroad-highway grade crossings and visibility. These are continuations of past successful conferences on these subjects.

Activities within TRB to improve our knowledge of traffic control in work zones recognizes the great current emphasis at the federal level on temporary traffic control measures to protect both the traveling public and on-site workers against accidents. Expenditures for traffic control today frequently exceed expenditures for the construction work itself. Funding agencies and researchers from different disciplines are working diligently together to develop a better understanding of human behavior in work zones and of the relative effectiveness of various control measures in order to provide a safe work site at lower cost.

One of the controversial questions facing highway administrators is whether a given expenditure can be most effectively used to rebuild a relatively short length of existing highway that uses every known safety technique or to provide a less comprehensive renewal and resurfacing over a much greater length of highway. It is not surprising that committee activities and the TRB session on Safety Measures of Effectiveness for Evaluating Highway Improvements have attracted much interest. A Group 3 committee, working with a committee from Group 2, sponsored a workshop in July 1979 on Resurfacing, Restoration, and Rehabilitation Projects on Existing Facilities: Improved Safety and Service.

Group 3 committee members, either acting through the existing committee organizational structure or through a special committee assembled for a specific purpose, sponsored the 12th Annual Workshop on Human Factors in Transportation and began planning for the 13th Annual Workshop in January 1980, cosponsored the First National Symposium on Transportation System Safety, and cosponsored a conference on Automobile Inspection, Maintenance, and Repair. Under contract with the National Highway Traffic Safety Administration, TRB (with heavy involvement of Group 3 committees) convened a National Conference on Highway Safety Research, Development, and Demonstration. The purpose of the conference was to conduct a comprehensive review of NHTSA's proposed five-year program of highway safety research and development.

The maintenance section of Group 3 addressed the question at a July meeting of how best to carry out the mandate of Congress that interstate maintenance quality standards be established and compliance monitored. State department of transportation authorities will most likely be faced with establishing state standards, subject to approval by the U.S. Department of Transportation, that will not expose them to increased tort liability litigation.

Two maintenance committees are undertaking preliminary planning for a fourth highway maintenance management workshop in 1980. Emphasis will be on highway maintenance management system updating and use of outputs for decision making and quality control. The emphasis in such systems in the 1960s was on establishing data collection systems to monitor productivity and provide scheduling tools; in turn the systems evolved into a vital budgeting tool, and now the time has come to modify the systems as necessary to make the data usable for other purposes.

A continuing emphasis on safety indicated that Group 3 will direct increased attention in the near future to improving transportation vehicles.

GROUP 4—LEGAL RESOURCES

Robert W. Cunliffe, chairman

During the 58th Annual Meeting, Group 4 and Group 3 presented a joint conference session on Federal and State Responsibilities in Transportation of Hazardous Materials. The session was well received, and Group 4 was again pleased to have the opportunity to participate in such program sessions and hopes for futher opportunities for joint sessions. In addition, several standing committees met during the Annual Meeting.

The 17th Annual Workshop on Transportation Law was held in Snowbird, Utah, July 30-August 3, 1978, in cooperation with the Utah Department of Transportation. It was attended by more than 80 attorneys who represented the federal and state transportation sectors, including aviation, railroads, and mass transit.

The 18th Annual Workshop on Transportation Law was held in St. Petersburg, Florida, July 29-August 2, 1979, in cooperation with the Florida Department of Transportation. John G. Wofford, deputy general counsel, U.S. Department of Transportation; Lorenzo Casanova, chief counsel, Federal Highway Administration; Raymond K. James, chief counsel, Federal Railroad Administration; Margaret M. Ayres, chief counsel, Urban Mass Transportation Administration; Frank A. Berndt, acting chief counsel, National Highway Traffic Safety Administration; Clifford F. DeWolf, chief counsel, U.S. Coast Guard; and Clark H. Onstad, chief counsel, Federal Aviation Administration, are among the distinguished representatives of the various transportation modes who participated in the workshop.

SPECIAL COMMITTEE ON PUBLIC INFORMATION

John C. Martin, chairman

The Special Committee on Public Information serves in an advisory capacity to ensure that information about the activities of the Transportation Research Board is brought to the attention of the public and also to those directly interested in transportation research. The committee's membership has been revised significantly this year, to bring in areas of coverage not previously represented. The committee consists of 18 experienced public information and public relations specialists in the field of transportation and related subjects. They are charged with solving specific problems that arise in implementing the public information program.

In preparation for the 58th Annual Meeting, committee members prepared 53 press releases on papers and sessions scheduled. Members also helped to staff the press room and serve the press representatives during the meeting. Press attendance totaled 45.

SPECIAL COMMITTEE ON AIR TRANSPORT ACTIVITIES

Ronald W. Pulling, chairman

The Special Committee on Air Transport Activities of the Transportation Research Board serves in an advisory capacity to monitor the developing air transport activities of TRB, identify new areas in aviation in which TRB needs to be involved, and endeavor to identify sources of financial support for the air activities of TRB.

Upon recommendation by the special committee, TRB established a new committee under the Facilities and Operations Section of Group 3 on Aircraft-Airport Compatibility. The special committee is now seeking recommendations for additional committees in aviation. A conference session on International Airport Developments was sponsored by the committee at the 1979 Annual Meeting.

FIFTY-EIGHTH ANNUAL MEETING

A record 4130 of the world's leading highway and transportation researchers, engineers, educators, and administrators attended the 58th Annual Meeting of the Transportation Research Board, held January 15-19, 1979, at the Sheraton-Park and Shoreham Americana Hotels in Washington.

Classification of Organization Represented	Number of Registrants
U.S. Department of Transportation	743
Other federal agencies	131
State highway and transportation departments	834
Other state agencies	75
Local governments	184
Foreign governments	89
Universities and colleges	722
Transit organizations	98
Research institutes	64
Consultants	544
Foreign nongovernment organizations	126
Service organizations	63
Trade associations	104
Industry	278
Press	45
Other	30
Total	4130

MEETINGS, CONFERENCES, AND WORKSHOPS

In addition to the Annual Meeting, the board conducts conferences and workshops throughout the year. This activity has continued to increase in recent years. During FY 1979, the following conferences and workshops were held.

Summer Annual Meeting of Planning and Transport Research and Computation, Ltd.

University of Warwick, Coventry, England, July 10-13, 1978

This four-day seminar examined the traffic and environmental management problems currently facing traffic and highway engineers and planners. Subjects included policy formulation and implementation, road safety and cycling, design, evaluation and assessment of traffic management schemes, and modeling of urban movement. The board's staff assisted in arranging program participation and attendance from the United States. The meeting was supported by a registration fee. Attendance was 800; a volume of proceedings will be distributed to the participants.

Workshop on Research and Development Needs in Construction Engineering Management

Motor House and Cascade Meeting Center, Williamsburg, Virginia, July 17-20, 1978

This was the second of two workshops scheduled in the east and west to formulate a national priority program of short- and long-range research and development needs in construction engineering management. The workshops were supported by funds from the Federal Highway Administration. The attendance was 60 and a report has been made to the sponsor.

Seventeenth Annual Workshop on Transportation Law

Snowbird Lodge, Snowbird, Utah, July 30-August 3, 1978

The workshop included papers, panel discussions, and courtroom demonstrations involving problems in highway and transportation law. It was supported by a registration fee of $65; it was conducted by Group 4 and cosponsored by the Utah Department of Transportation. Eighty persons were in attendance.

Conference on Transportation Improvements

Holiday Inn–Illinois Beach Resort, Zion, Illinois, August 13-17, 1978

This conference included both formal presentations and group discussions on (a) overcoming obstacles to transit improvements and innovations and (b) economic and energy considerations in operating transportation systems. The conference was sponsored by the Group 1 Sections on Social, Economic, and Environmental Factors and on Public Transportation. The attendance was 70.

Workshop on Implications of Fuel-Efficient Vehicles for Ride Quality and Passenger Acceptance

NAS Summer Studies Center, Woods Hole, Massachusetts, September 6-8, 1978

The purpose of this workshop was to examine the interactions between user decision parameters and technological and operational developments in transportation systems leading toward improved energy efficiency and to define the issues and problems that result from this examination. Funds from the U.S. Department of Transportation and the National Aeronautics and Space Administration supported the workshop. The board's Committee on Ride Quality and Passenger Acceptance developed the program. A final report will be prepared by the University of Virginia. There were 48 in attendance.

Bridge Engineering Conference

Chase Park-Plaza Hotel, St. Louis, Missouri, September 25-27, 1978

The specific objective of this conference was to facilitate an interchange of information on all aspects of design, construction, rehabilitation, and maintenance of vehicular bridges with specific emphasis on problems and solutions of interest to practicing bridge engineers and administrators of highway, railroad, and transit agencies. The conference was sponsored by TRB, with funds from the Federal Highway Administration and Federal Railroad Administration and a registration fee of $60 for those who preregistered and $70 for those who registered during the conference. There was an attendance of 638 and the proceedings have been published in TRB Research Records 664 and 665.

Review of Guidelines for a Study of Highway Cost Allocation

National Academy of Sciences, Washington, D.C., October 5-6 and November 20-21, 1978

The Congressional Budget Office (CBO) was required under the Surface Transportation Act of 1978 to prepare guidelines for a new study on highway cost allocation. The U.S. Department of Transportation will perform the study, which will provide Congress with relevant data. CBO asked TRB to convene a panel of experts, including those from the transportation industry most affected by such changes. The panel reviewed background working papers and proposed study guidelines that had been prepared by CBO. The panel of 14 members held two two-day meetings in Washington, D.C., in October and November 1978. An unpublished report has been submitted to CBO.

Workshop on Research and Development Needs in Construction Engineering Management

Belmont Conference Center, Elkridge, Maryland, November 12-15, 1978

The objective of this workshop was to formulate, from the output of two earlier regional workshops, a national priority program of short- and long-range research and development needs in construction engineering management. The final report has been submitted to the sponsor, the Federal Highway Administration. There were 21 in attendance.

Review of Socioeconomic Issues in Automated Guideway Transit

National Academy of Sciences, Washington, D.C., November 14-15, 1978

At the request of the Urban Mass Transportation Administration (UMTA), TRB convened a panel of experts to review two automated guideway transit (AGT) projects on generic alternatives analyses and markets for AGT, under UMTA's Socioeconomic Research Program. A draft report has been submitted to UMTA and is being reviewed by the panel members. There were 38 in attendance.

Transportation and Telecommunications in Rural Areas

National Academy of Sciences, Washington, D.C., November 21, 1978

The purpose of this meeting, held with the cooperation of TRB, the Telecommunications-Computer Applications Board of the Assembly of Engineering, and the Assembly of Behavioral and Social Sciences, was to aid the Commission on Sociotechnical Systems (CSS) in determining whether the National Research Council should propose and undertake a study of rural transportation and communication systems. CSS convened the meeting with the support of the U.S. Department of Agriculture and the Farmers Home Administration. Minutes of the meeting were prepared by TRB and transmitted to the 40 attendees.

Conference on Transportation Planning for Small and Medium-Sized Communities

Sarasota Hyatt House, Sarasota, Florida, December 3-6, 1978

This conference was conducted at the request of the Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA). The objective was to provide for the exchange of experience among a sample of practitioners engaged in transportation planning for urban areas that have a population of 200 000 or less, to provide guidance for transportation policies and programs, and to foster the development of future activities of TRB's Committee on Transportation Planning Needs and Requirements of Small and Medium-Sized Communities. The conference was supported by funds from UMTA and FHWA and a registration fee of $30. There were 85 in attendance; a Special Report will be published.

Workshop on the Feasibility of Surface Light Rail Transit

National Academy of Sciences, Washington, D.C., December 5-6, 1978

The purpose of this workshop was to explore the issues related to the planning, design, construction, and operation of surface light rail transit and to identify specific needs for study and research. There were 47 persons in atten-

dance. The workshop was supported by funds from the Urban Mass Transportation Administration; an unpublished report is being prepared for the sponsor.

Conference on Highway Traffic Noise Mitigation

Los Angeles Bonaventure Hotel, Los Angeles, California, December 11-15, 1978

This conference was convened to provide a national forum for the discussion of noise-abatement experiences and techniques that have been used successfully at the state level, with specific emphasis on noise-barrier design tools, materials, and systems and community interaction in barrier projects. The conference was supported by funds from the Federal Highway Administration, and the proceedings will be made available through the Office of Environmental Policy. There were 143 in attendance.

Twelfth Annual Human Factors Workshop

Sheraton-Park Hotel, Washington, D.C., January 14, 1979

This was the 12th in a series of workshops held each year in conjunction with the TRB Annual Meeting. The workshop is designed to provide an opportunity for professional enrichment, exchange of information, and expansion of the research base for those who would apply or conduct research. It included users of research and information on human factors; researchers engaged in studies of aspects of human factors pertaining to vehicle design, vehicle operation, and system safety; and practitioners involved in the design and operation of the transportation system. The workshop was supported by a registration fee of $40, and there were 140 in attendance.

Workshop on Paratransit

Motor House and Cascade Meeting Center, Williamsburg, Virginia, February 11-14, 1979

This workshop was convened at the request of the Urban Mass Transportation Administration (UMTA) to review the problems encountered and the progress made in paratransit development over the last three years. Resource papers were presented to define the basic issues and provide detailed background material. The workshop was supported by funds from UMTA, and the attendance was 77. The proceedings will be published in TRB's Special Report series.

Workshop on Transportation Planning for Economically Disadvantaged Persons: Travel Behavior and Demand Forecasting

Cleveland Plaza Hotel, Cleveland, Ohio, April 8-11, 1979

At the request of the Urban Mass Transportation Administration (UMTA), TRB conducted this workshop on transportation service equity to examine the planning tools required for predicting travel demand and behavior for persons whose mobility is limited due to economic factors. The workshop was supported by a registration fee of $25 and funds from UMTA. A report will be made to the 29 attendees and the sponsor.

Conference on Highway Safety Research, Development, and Demonstration

Dulles Marriott Conference Center, Dulles Airport, Virginia, April 22-26, 1979

The purpose of this conference was to elicit the views and recommendations from a cross section of the national highway safety community on issues related to the highway safety research development and demonstration program of the National Highway Traffic Safety Administration (NHTSA). It was supported by funds from NHTSA and a registration fee of $20. A report will be made to the 142 in attendance and the sponsor.

Conference on Statewide Transportation Planning and Programming

Airlie House, Warrenton, Virginia, April 29-May 2, 1979

This conference reviewed and assessed the current issues in statewide transportation to further update the current state of the art. The conference was supported by funds from the Federal Highway Administration, Urban Mass Transportation Administration, Federal Railroad Administration, and Federal Aviation Administration. The attendance was 128; the proceedings will be published in TRB's Special Report series.

Workshop on Information Aids for Transit Consumers

National Academy of Sciences, Washington, D.C., April 30-May 2, 1979

This meeting was structured around workshops that focused on system maps, timetables, destination (roller) signs and bus stop signs, and systems orientation. Resource papers, written by people who have a particular expertise and perspective to contribute, were provided to conference participants in advance. The workshop was supported by funds from the Urban Mass Transportation Administration and a registration fee of $30. A report will be made to the 63 in attendance and the sponsor.

International Air Transportation Conference

Monteleone Hotel, New Orleans, Louisiana, May 1-3, 1979

This conference assessed the current state of the art and pointed out future trends in air transportation. The conference was designed to establish communication between designers and users. The conference was cosponsored by the American Society of Civil Engineers, Society of Automotive Engineers, American Institute of Aeronautics and Astronautics, British Institute of Civil Engineers, Air Transportation Research International Forum, and TRB. The conference was supported by a registration fee of $50; there were 300 in attendance.

First National Symposium on Transportation System Safety

National Academy of Sciences, Washington, D.C., May 7-9, 1979

The purpose of this symposium was to present the state of the art of system safety practices related to all modes of transportation. The symposium was cosponsored by the Polytechnic Institute of New York and TRB and was financed through a contract between the Polytechnic Institute of New York and the U.S. Department of Transportation and a registration fee of $25. There were 130 in attendance; a report will be issued.

Conference on Vertical Movement in Transit Stations: Issues and a Search for Solutions

Sheraton International Conference Center, Reston, Virginia, May 20-23, 1979

The objectives of this conference were to identify the many varying issues and requirements for improving the vertical movement of people in transit stations, determine the range of potential solutions that apply, and determine research needs for solving identifiable problems and establish a five-year research program aimed at the implementation of immediate solutions. The conference was supported by funds from the Urban Mass Transportation Administration and a registration fee of $60. A report will be issued to the 60 attendees and the sponsor.

Conference on Automobile Inspection, Maintenance and Repair

National Academy of Sciences, Washington, D.C., May 22-24, 1979

The National Highway Traffic Safety Administration (NHTSA), in cooperation with TRB, conducted this workshop to address the principal issues involved in automobile inspection, maintenance, and repair. The purpose was to obtain consumer and industry input to assist NHTSA in planning future programs. The approximate attendance was 130, and a report is anticipated from the Office of Traffic Safety Programs of NHTSA.

Fourth National Conference on Rural Public Transportation

Manor Vail, Vail, Colorado, June 12-15, 1979

This conference included discussions on contracting with intercity bus operators; transition from specialized to public transportation; labor protection; organization and service alternatives; management, managers, and training; and the requirements of section 504 (accessibility for the handicapped). The conference was supported by funds from the Urban Mass Transportation Administration and a registration fee of $35 for those who preregistered and $40 for those who registered during the conference. It was held in cooperation with the Office of the Secretary, Federal Highway Administration, and the Transportation Systems Center of the U.S. Department of Transportation; National Transportation Policy Study Commission; Intergovernmental Science, Engineering, and Technology Advisory Panel; U.S. Department of Agriculture; U.S. Department of Health, Education, and Welfare; and the town of Vail. There were 232 in attendance at the conference; a report is anticipated.

Follow-Up Railroad Research Needs Study

NAS Summer Conference Center, Woods Hole, Massachusetts, June 18-21, 1979

At the request of the Association of American Railroads (AAR) and the Federal Railroad Administration (FRA), an invitational group of 35 was selected to assess the results of the 1975 Railroad Research Needs Study held at Woods Hole and to see whether priorities for research have changed or new needs have arisen. Unexpected fund balances from AAR and FRA defrayed the cost of this study.

SPECIAL TECHNICAL ACTIVITIES

The Special Technical Activities Division (Division B) administers and sometimes conducts projects that are funded outside the regular operating budget of the board. It also manages the development and operation of transportation research information services. In the TRB organization, this division receives guidance from the 10-member Division B Council, chaired by Harmer E. Davis. A given TRB activity may be designated as a special project essentially by three routes:

1. By agreement between TRB and another National Academy of Sciences unit that has been asked to carry out the special study (a 1969 project on ambulance design criteria conducted in cooperation with the Division of Medical Sciences is an example);
2. Through TRB cooperation with sponsors, including NCHRP, of projects that require unique TRB capabilities but that are not appropriate to the Regular Technical Activities Division (a 1967 highway litter study and an NCHRP project on economic consequences of highway improvements are examples); and
3. Through TRB solicitation of sponsorship, including NCHRP, for a project whose output will be directly applicable to the board's overall objectives (the U.S. AID project and NCHRP Project 20-5 are current examples).

In accordance with the policy of the National Academy of Sciences, an advisory committee of appropriate experts may be formed to give advice and counsel on the conduct of a special project. Staff as needed are employed for each project, and other designated members of the TRB staff may serve as technical advisors.

In FY 1979, the work of Division B included seven activities that are discussed and summarized below.

TRANSPORTATION TECHNOLOGY SUPPORT FOR DEVELOPING COUNTRIES

In October 1977, Division B began a three-year special project under the sponsorship of the U.S. Agency for International Development (AID) to enhance rural transportation in developing countries by providing improved access to existing information on the planning, design, construction, and maintenance of low-volume roads. With advice and guidance from a project steering committee, information products are produced and transmitted through a network of correspondents in more than 60 developing countries. The products include compendiums of previously published information on relatively narrow topics, syntheses of existing information on somewhat broader topics, and proceedings of international workshops on low-volume roads. The project work also includes field visits to developing countries and colloquiums for students from developing countries who are attending U.S. colleges and universities. In FY 1979 six compendiums were published, three compendiums are near completion, and three syntheses were developed to the editorial stage.

SUMMARY OF SPECIAL TECHNICAL ACTIVITIES DURING FISCAL YEAR 1979

Projects and Operations	Started	End of Current Contract	Technical Committee	Principals	Sponsors	Current Year Funds ($)
Synthesis of existing information related to highway problems	12-67	Open	R. Biege, Jr.	T. Copas H. Pennock	NCHRP	360 000
Right-of-way and legal problems	11-68	Open	R. Cunliffe	L. Thomas	NCHRP	100 000
Operation of Highway Research Information Service	6-67	6-79 9-79		A. Mobley	States FHWA	554 000
Operation of Maritime Research Information Service	6-69	9-79	R. Taggart	D. Mellor	MARAD	170 000
Operation of Railroad Research Information Service	3-72	9-79		F. Houser	FRA	150 000
Development and Operation of Air Transport Research Information Service	9-76	9-79	J. Drake	P. Irick S. Schofer	FAA	98 000
Transportation Technology Support for Developing Countries	10-77	9-80	K. Bergstralh	L. Crowther	U.S. AID	260 000

SYNTHESIS OF INFORMATION RELATED TO HIGHWAY PROBLEMS

The objectives of this NCHRP project are to bring together research results, published material, and current practices on relatively narrow highway topics. Technical panels and consultants assist the project staff in acquiring, evaluating, and organizing the material on each topic into a Synthesis of Highway Practice.

Work on the following nine topics was completed in FY 1979: rehabilitation of PCC pavement joints, design and use of highway shoulders, relationship of asphalt cement properties to pavement durability, bituminous patching mixtures, durability of concrete bridge decks, changeable message signs, failure and repair of continuously reinforced concrete pavements, state resources for financing transportation programs, and consequences of deferred maintenance.

Also completed was Research Digest 106 on use of waste materials in highway construction and maintenance.

Drafts have been completed on the following nine topics: bus transit service planning guides (routes and schedules); relationship of quality assurance to performance; alternative work schedules (experience and transportation impacts); direction finding from arterials to destinations; design of sedimentation basins; glare screen guidelines; rapid testing; motor vehicle size and weight regulations, enforcement, and permit operations; and bridge drainage systems.

Other topics on which work has been started include photologging, welding and inspection practices in bridge fabrication, environmental monitoring (air, water, noise), formulating and justifying highway maintenance budgets, collection and use of pavement condition data, below-the-waterline inspection and repair of bridge substructures, state transit-management assistance to local communities, defining transportation needs to fit constrained financial resources, value engineering in preconstruction activities, value engineering on construction contracts, techniques for minimizing reflection cracking, utilization of information systems in construction management, and geotechnical instrumentation for monitoring field performance.

RIGHT-OF-WAY AND LEGAL PROBLEMS

Several new papers were written for inclusion in the three-volume set entitled *Selected Studies in Highway Law.* They are Legal Implications of Control of Access on Uncontrolled-Access Highways, Right to Compensation in Eminent Domain for Abrogation of Restrictive Covenants, Liability of the State for Highway Traffic Noise, Payment of Attorneys' Fees in Eminent Domain and Environmental Litigation, and Recent Developments in the Law of Inverse Condemnation.

In addition, as part of a continuing effort to keep the set up to date, supplementation papers were written for eight papers that appear in Volume 2. The set contains more than 2000 pages of text and 40 000 case citations and provides comprehensive coverage in the field of highway law.

HIGHWAY RESEARCH INFORMATION SERVICE

Use of the Highway Research Information Service (HRIS) by the state highway and transportation departments and the Federal Highway Administration continued at a high level in FY 1979. The number of requests for specific batch-mode file searches of the HRIS storehouse was 985. In addition, an average of 47 sponsors requested more than 10 of the 13 TRB-selected HRIS responses offered each month to all 53 sponsors.

HRIS continued magnetic tape exchange of highway transportation research information with the U.K. Transport and Road Research Laboratory, the English-language center for the International Road Research Documentation (IRRD) scheme. Each month nearly 200 IRRD selections of abstracts of non-U.S. published works are made available to HRIS on communication format tapes, the medium used for international exchange of transportation research information. Magnetic tape is also used to exchange ongoing highway transportation research project information with the Smithsonian Science Information Exchange (SSIE). The SSIE contribution adds about 50 summaries of U.S. ongoing research projects to the HRIS file each quarter. Abstracts of published U.S. research reports were acquired from the National Technical Information Service (NTIS) in machine-readable-record (MRR) form. Abstracts of journal articles and technical papers in conference proceedings were purchased in MRR form from Engineering Index. Overall, nearly 50 percent of HRIS selections are now acquired in MRR form since they are less costly to store and less likely to introduce coding or keyboarding errors into the data base. Duplication of the documentation efforts of other information services outside of TRB is thus avoided.

The HRIS file now contains more than 81 600 references, including 6100 ongoing research project summaries. About 35 percent of the HRIS document records are from sources in 72 foreign countries.

Four quarterly issues of *HRIS Abstracts* were published. They contained 4380 abstracts of published technical papers in conference proceedings, research reports, journal articles, and bibliographies stored on the HRIS magnetic tape files during the year. A cumulative index to the four issues was published in the *HRIS Abstracts* Vol. 11, No. 4, Winter 1978 issue. The number of subscribers increased from 2050 to 2300; the annual subscription price remained at $40.00.

A *TRB Publication Index* was prepared by HRIS during the latter half of 1978 for distribution by TRB. The annual index contains bibliographic citations to 520 technical papers, monographs, and research reports published by TRB during 1977.

The Connecticut Department of Transportation asked HRIS to discuss, explain, and illustrate the content, scope, products, and services of the research information services operated by TRB. Nearly 100 representatives from 21 Connecticut state government agencies and FHWA attended the series of five workshops in November 1978.

As a result of the recommendations of the participants in the three regional HRIS Users Workshops, the HRIS subject areas were modified in January 1979. The revised subject areas closely parallel the subject areas adopted by

TRB in January 1979 for selective distribution of its publications, but for HRIS the subject areas are limited to non-rail transit and highway transport.

Again this year, HRIS staffed the Transportation Research Information Center booth at the TRB Annual Meeting. Products of HRIS and the other information services operated by TRB were displayed, and on-line retrieval was demonstrated to interested persons among the 4130 registrants.

In February 1979, HRIS issued its first newsletter (as recommended by the user community). The *HRIS NEWS* will be published intermittently to inform HRIS users and potential users of HRIS services, projects, and new developments. The second issue of the *HRIS NEWS* was issued in March 1979 to announce the appointment of HRIS contacts by the state highway and transportation departments. The states wished to designate an HRIS contact person to facilitate effective use of the board's information services by state personnel. To date 49 states, Puerto Rico, and the District of Columbia have appointed an HRIS contact.

Until April 1979, about half of the HRIS file was part of the TRIS-On-Line data base at Battelle Columbus Laboratories and was thus available for on-line searches. The U.S. Department of Transportation plans to reestablish TRIS-On-Line through a new vendor. It is expected that implementation of these plans will include on-line access to all HRIS records that have been stored since 1970.

HRIS participated in the Technology Transfer Forum and Exposition of the New England Federal Regional Council, the New England Innovation Group, and the New England Municipal Center on May 21, 1979, in Hartford, Connecticut. About 300 participants had an opportunity to visit the TRB exhibit to examine HRIS products and to discuss HRIS services with the manager of HRIS, who helped staff the TRB booth.

MARITIME RESEARCH INFORMATION SERVICE

The Maritime Research Information Service (MRIS) is sponsored by the Maritime Administration and is operated by TRB with advice from the Maritime Information Committee of the Maritime Transportation Research Board, National Research Council. The service has been operational for nine years and now has more than 18 000 references, which are searchable either by batch-mode retrieval or on-line through the Lockheed DIALOG system. A MRIS key-word index was published in February 1979 as a user aid in on-line searching. The semiannual *MRIS Abstracts* was published during calendar year 1978. In addition, two bibliographies were published: *Marine Systems in Frigid Environments,* in March 1978, and *Waterborne Transit,* in October 1978.

RAILROAD RESEARCH INFORMATION SERVICE

The Railroad Research Information Service (RRIS) has been operational for six years; it serves the Federal Railroad Administration (its sponsor) and many other segments of the railroad community in the United States, Canada, and overseas. The magnetic tape file contains more than 18 000 citations, over 400 of which are summaries of railroad-related ongoing research projects in North America or of European investigations that receive some U.S. financial support. The remainder of the RRIS file consists of abstracts of all types of published railroad information from worldwide sources and descriptions of North American computer programs and magnetic data tapes. The Autumn 1978 and Spring 1979 issues of RRIS's semiannual *Railroad Research Bulletin* were published and distributed. RRIS has promoted both its publications and retrieval services to the extent that its self-generated income was up by nearly 20 percent over that for the comparable period of the previous fiscal year.

AIR TRANSPORTATION RESEARCH INFORMATION SERVICE

The Air Transportation Research Information Service (ATRIS) is completing its third year of development under the sponsorship of the Federal Aviation Administration.

A developmental abstracts bulletin, entitled *Air Transportation Bibliography* (Report FAA-EM-78-21), was distributed to more than 1300 air transportation information users to demonstrate the potential of a regular ATRIS abstract bulletin. A questionnaire that accompanied the publication was designed to elicit from the recipients how such a bulletin might best be prepared to meet the information needs and wants of the air transportation community.

Preliminary results from the questionnaire returns indicate a potential of 300 subscribers to a regularly published ATRIS abstracts bulletin. Respondents also indicated a high interest in references to government policy, forecasts, economics, passenger demand, and airports.

ATRIS continues to add new abstracts to the data base in order to develop capability for batch-mode and on-line retrieval service.

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

With the close of FY 1979, the National Cooperative Highway Research Program (NCHRP) completed its 17th year as the principal mechanism for providing the state highway and transportation departments with a long-range program of systematic, well-designed, applied research on the many nationwide problems that face administrators and engineers.

The NCHRP concept of operation continues to be effective in solving increasingly complex problems and providing practical solutions for pressing national highway and urban transportation problems. It also has provided an extensive reservoir of technical information that is being used in the development of practical solutions for all ranges of problems being worked on by other agencies, including contributions to road research and better transportation systems throughout the world. Because of its demonstrated successes, both foreign and domestic organizations continue to investigate the NCHRP operation to determine the suitability of similar programs for addressing their own particular needs.

NCHRP was established in 1962 to provide a continuing program of highway research. It is sponsored by participating member departments of the American Association of State Highway and Transportation Officials (AASHTO), in cooperation with the Federal Highway Administration of the U.S. Department of Transportation and is carried out under a three-way agreement among these two agencies and the National Academy of Sciences (NAS).

Each state annually contracts with the academy to commit 4.5 percent of its 1.5 percent federal-aid highway planning and research funds. From these contributions, a cooperative pool of about $4.1 million is made available for NCHRP's contract research and for its administrative and technical operation.

AASHTO annually proposes research problems for inclusion in NCHRP's fiscal-year activities. At least two-thirds of the participating member departments must approve the research problems and agree to their financial support before they can be brought into the program. After the balloting by member departments, the approved problems are reviewed by the TRB Executive Committee Subcommittee for NCHRP as to their acceptability for administration by NAS through TRB.

Once they have been accepted, the problems that make up each program are assigned to panels that provide guidance on the technical aspects. These panels have at present some 661 members who represent the District of Columbia, Canada, and 90 percent of the states. The panel members analyze the problems, outline particular projects and their objectives, and prepare research project statements that are used to solicit proposals from qualified private and public research agencies. They review the proposals, recommend contract awards, and provide counsel to the NCHRP staff responsible for surveillance of work under the research contracts. Finally, they review reports for acceptability and for accomplishment of the approved research plan.

Through FY 1979, these activities have resulted in the development of 306 research projects, for which 360 contracts have been executed at a total funding level of some $42.8 million. The subject matter of the projects ranges across the full spectrum of concern within the transportation field and indicates the sponsors' immediate interest in acquiring early answers to their many problems. The contracts have been let to agencies headquartered in the District of Columbia and more than half of the states. Universities have received about 38 percent of the contracts; research institutes, 20 percent; industry, consultants, and trade associations, 38 percent; professional societies and service organizations, 2 percent; and state highway and transportation departments and other transportation or government agencies, 1 percent.

Official referral to NAS of the FY 1980 program—the 18th program of research problems for NCHRP—was made in February 1979. This program, funded at $2.66 million for research, consists of nine continuation projects and seven new contracts, a listing of which follows. It is estimated that research on this program will begin in October 1979.

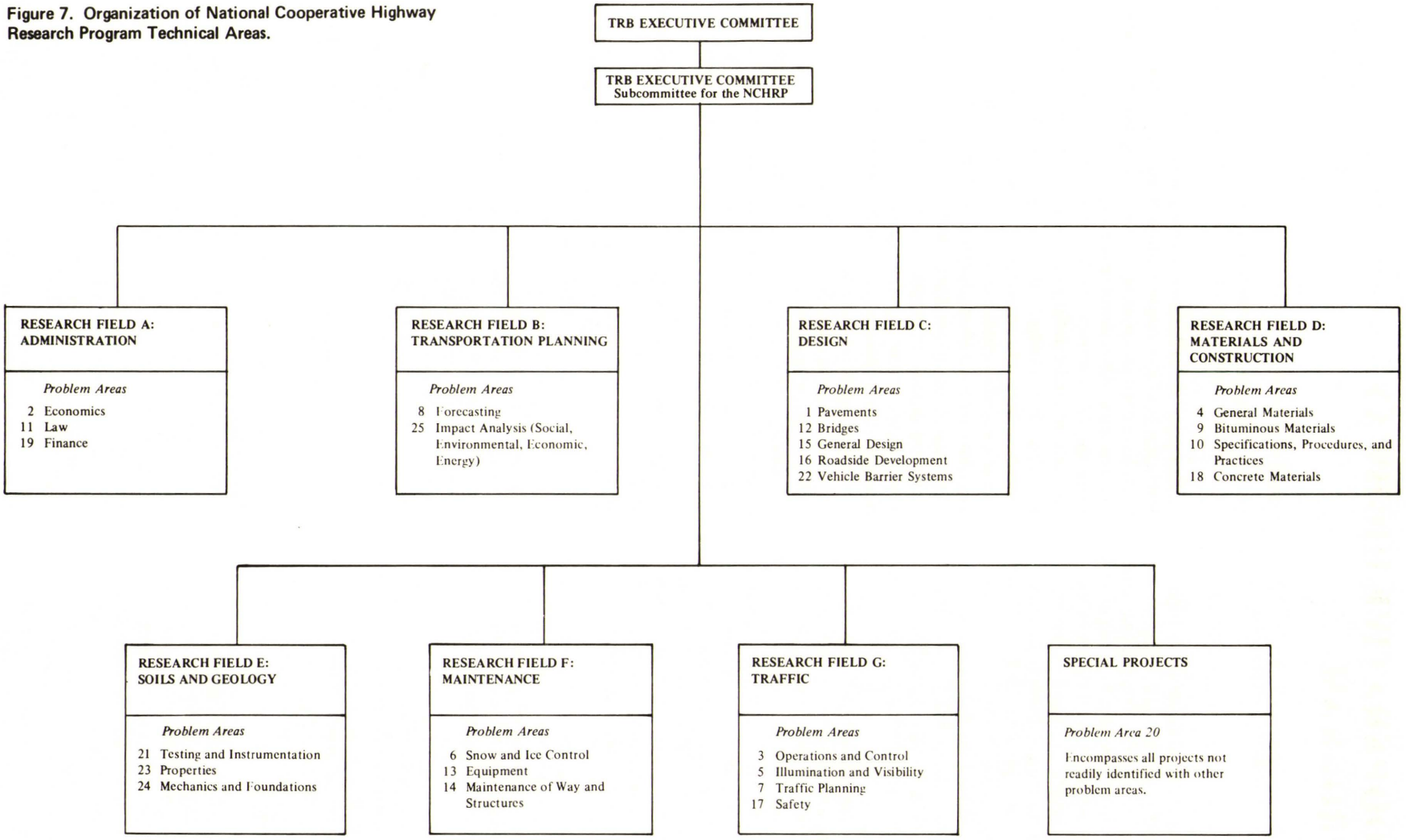
A professional staff assigned to NCHRP by TRB includes projects engineers who have broad experience and training appropriate to administrative and technical surveillance of the research. The engineers review quarterly progress reports and monthly progress schedules, maintain telephone contacts, visit the assigned projects throughout their contract periods, and discuss the projects with the principal investigators to learn whether the research is being pursued in line with the approved research plans.

Meetings that involve the staff, project panels, and agency personnel are held frequently to review progress and provide guidance for continuing work. Thirty-seven such meetings were held in FY 1979. The projects engineers and the project panels evaluate the completed research to determine the degree of technical compliance with the contracts and the acceptability of the final reports to TRB and NAS.

The work of NCHRP is manifested principally through its publications. Research findings are published in either of two regular NCHRP report series. Publication priorities are based on the usefulness of the results to the sponsors. All possible means of reporting are used to get results in the hands of the potential users as quickly as possible. Each highway administrator receives a copy immediately on publication, and some 3000 to 5500 copies are formally distributed through TRB's selective distribution system.

Thus far, 433 report drafts (interim or final) have been received from research contractors and have resulted in 264 regular NCHRP reports. Sixty-one project reports have not been published but are available through University Microfilms International. The remaining report drafts are in the acceptance, review, or publication processes. A list

Figure 7. Organization of National Cooperative Highway Research Program Technical Areas.



of the reports issued this year is given below.

Another means of bringing research findings before practicing engineers is the *NCHRP Research Results Digest,* a series of flyers published at frequent intervals to provide an early awareness of research results of the various projects. Making these results known as they are developed and before they are published in final reports encourages their early application.

Semiannual progress reports were submitted by NCHRP to the sponsors to keep them informed of the status of all active projects. An important feature of these progress reports is the documentation of known uses of NCHRP results, as well as any known cost savings, so that all states may be aware of the practical applications. Considerable feedback from the states documents the value and use of many of the research products.

During FY 1979, an AASHTO-appointed monitoring committee met with TRB staff to review all aspects of NCHRP operation and concluded that progress was satisfactory.

NCHRP is a unique contract research effort designed to respond quickly and efficiently to the needs of the state highway and transportation departments by solving pressing transportation problems. Although TRB administers the program, the research content is solely the prerogative of AASHTO and the participating member state highway and transportation departments. The program is one of applied rather than basic research, and every effort is made to help administrators use the research findings. Although NCHRP research is sponsored by AASHTO, the design and operation of the program are amenable to the administration of research sponsored by any agency.

TENTATIVE AND CONTINUING RESEARCH PROJECTS FOR FISCAL YEAR 1980

Projects	Allotted Amount ($)
Tentative New Projects	
AREA 1: DESIGN–PAVEMENTS	
Project 1-21: Rehabilitation of Concrete Pavement	300 000
AREA 8: TRANSPORTATION PLANNING–URBAN TRANSPORTATION	
Project 8-24: Forecasting the Basic Inputs to Transportation Planning	75 000
Project 8-25: Intercity Bus Transportation Planning	240 000
AREA 9: MATERIALS AND CONSTRUCTION–BITUMINOUS MATERIALS	
Project 9-5: Asphalt Emulsions for Road or Plant Mixes and Seal Coats	160 000
AREA 10: MATERIALS AND CONSTRUCTION–SPECIFICATIONS, PROCEDURES, AND PRACTICES	
Project 10-15: Inspection and Strength Evaluation of Concrete Bridges	225 000
AREA 15: DESIGN–GENERAL DESIGN	
Project 15-7: Hydraulic Effects of the Loss of Flood Storage on Downstream Flooding Potential	100 000
AREA 17: TRAFFIC–SAFETY	
Project 17-5: Effectiveness of Roadway Safety Zones	200 000
Subtotal	1 300 000
Continuing Projects	
AREA 1: DESIGN–PAVEMENTS	
Project 1-10B: Development of Pavement Structural Subsystems	50 000
Project 1-19: Development of a System for Nationwide Evaluation of Portland Cement Concrete Pavements	100 000
AREA 3: TRAFFIC–OPERATIONS AND CONTROL	
Project 3-20: Traffic Signal Warrants	150 000
Project 3-28: Development of an Improved Highway Capacity Manual	150 000
AREA 12: DESIGN–BRIDGES	
Project 12-20: Bridges on Secondary Highways and Local Roads: Rehabilitation and Replacement	50 000
AREA 17: TRAFFIC–SAFETY	
Project 17-4: Evaluation of Traffic Controls for Street and Highway Work Zones	250 000
AREA 20: SPECIAL PROJECTS	
Project 20-5: Synthesis of Information Related to Highway Problems	360 000
Project 20-6: Right-of-Way and Legal Problems Arising out of Highway Programs	150 000
Project 20-7: Research for AASHTO Standing Committee on Highways	100 000
Subtotal	1 360 000
Total	2 660 000

PUBLICATIONS RELEASED DURING FISCAL YEAR 1979

Travel Estimation Procedures for Quick Response to Urban Policy Issues, Report 186

Quick-Response Urban Travel Estimation Techniques and Transferable Parameters: User's Guide, Report 187

Fatigue of Welded Steel Bridge Members Under Variable-Amplitude Loadings, Report 188

Quantifying the Benefits of Separating Pedestrians and Vehicles, Report 189

Use of Polymers in Highway Concrete, Report 190

Effect of Air Pollution Regulations on Highway Construction and Maintenance, Report 191

Predicting Moisture-Induced Damage to Asphaltic Concrete, Report 192

Beneficial Effects Associated with Freeway Construction: Environmental, Social, and Economic, Report 193

Traffic Control in Oversaturated Street Networks, Report 194

Minimizing Premature Cracking in Asphaltic Concrete Pavement, Report 195

Reconditioning Heavy-Duty Freeways in Urban Areas, Report 196

Cost and Safety Effectiveness of Highway Design Elements, Report 197

State Laws and Regulations on Truck Size and Weight, Report 198

Evaluating Options in Statewide Transportation Planning and Programming: Techniques and Applications, Report 199

Monitoring Carbon Monoxide Concentrations in Urban Areas, Report 200

Acceptance Criteria for Electroslag Weldments in Bridges, Report 201

Construction Contract Staffing, Synthesis of Highway Practice 51

Management and Selection Systems for Highway Maintenance Equipment, Synthesis of Highway Practice 52

Precast Concrete Elements for Transportation Facilities, Synthesis of Highway Practice 53

Recycling Materials for Highways, Synthesis of Highway Practice 54

Storage and Retrieval Systems for Highway and Transportation Data, Synthesis of Highway Practice 55

Joint-Related Distress in PCC Pavement: Cause, Prevention, and Rehabilitation, Synthesis of Highway Practice 56

Durability of Concrete Bridge Decks, Synthesis of Highway Practice 57

Consequences of Deferred Maintenance, Synthesis of Highway Practice 58

ADMINISTRATION

The administrative activities of the Transportation Research Board are located in Division C and the responsibility of the assistant director for administration. Division C is responsible for the preparation and control of budgets for all TRB accounts. It maintains liaison with the comptroller of the National Academy of Sciences, the Office of Administrative Services, the Office of Buildings and Grounds, the Office of Contracts and Grants, and the Personnel Office.

PUBLICATION PROGRAM

TRB has gained an enviable reputation as an agency that consistently reports useful results based on transportation research conducted in the United States and in other countries. TRB's ambitious publication program is the primary mechanism for getting this information to those who can best use it. A summary of the publication program is given below.

Papers originally presented at TRB annual meetings and accepted for publication after stringent review generally appear in the Transportation Research Record series. Reports of research in which the TRB staff or committees actively participate are published in the Special Report series.

Research conducted through the National Cooperative Highway Research Program is reported in three series: the NCHRP Reports, the Research Results Digest, and the Synthesis of Highway Practice.

TRB also publishes bimonthly the widely read *Transportation Research News.* A special section in each issue contains abstracts of about 50 important items. The works of special committees are often disseminated through the Transportation Research Circular series. In addition, TRB publishes a Bibliography series, a quarterly Highway Research Information Service Abstracts, a semiannual Railroad Research Information Service Bulletin, and a semiannual Abstracts of the Maritime Research Information Service.

In addition to the publications discussed above, programs for the Annual Meeting and the conferences and workshops, newsletters, associate and author information booklets, and other miscellaneous material were published.

Through a system of selective distribution, associates may elect to receive TRB publications in 29 subject areas. During FY 1979, more than 292 800 copies of these publications were distributed to associates of the board in the United States and in some 80 foreign countries.

Most publications are furnished to regular TRB sponsors as one of the services rendered in consideration of their support, but over-the-counter sales to interested individuals and to booksellers also contribute to wide circulation.

SUMMARY OF PUBLICATION PROGRAM FOR FISCAL YEAR 1979

Series or Type	Volumes and Numbers	Individual Publications	Incorporated Papers or Reports	Pages	List Price ($)
Special Report	Nos. 175, 176, 179, 182 to 185	7	7	1 188	61.80
Transportation Research Circular	Nos. 196 to 208	13	13	314	19.50
Transportation Research News	Nos. 77 to 82	6	215[a]	292	15.00
Transportation Research Record	Nos. 647, 650 to 660, 664 to 672, 674 to 677	25	315	2 166	123.80
NCHRP Report	Nos. 190 to 201	12	12	1 348	84.80
NCHRP Synthesis of Highway Practice	Nos. 51 to 58	8	8	424	42.00
NCHRP Research Results Digest	Nos. 105 to 114	10	10	174	20.00
HRIS Abstracts	Fall and Winter 1978, Spring and Summer 1979	4	4 384[a]	1 168	48.00
MRIS Abstracts	Vol. 18, Dec. 1978	1	1 422[a]	292	25.00
MRIS Current Awareness	Vol. 15, Nos. 7 to 12	6	1 498[a]	324	25.00
RRIS Bulletin	Vol. 5, No. 2; Vol. 6, No. 1	2	2 273[a]	656	40.00
Directory	1978	1	1	456	10.00
Compendium (Developing Countries)	Nos. 1 to 6	6	52	1 704	64.50
		101	10 210	10 506	579.40

[a]Brief abstracts of full reports contained.

ORGANIZATIONAL AND INDIVIDUAL AFFILIATION

Effective January 1, 1979, substantial changes in TRB programs for organizational and individual affiliation were adopted.

As reported in our Annual Report for 1978 and the November-December 1978 issue of *Transportation Research News,* these changes included reducing the number of classifications to sponsors, sustaining associates, contributing associates, and individual associates.

Sponsors are the principal supporters of TRB and include the 50 state highway and transportation departments, the District of Columbia, Puerto Rico, the Federal Highway Administration, the Urban Mass Transportation Administration, the Federal Railroad Administration, the Federal Aviation Administration, and the Association of American Railroads.

Sustaining associates are organizations that support TRB at a level considerably higher than the direct cost to TRB of the publications and other services they receive. The minimum fee for a sustaining associate is $5000. There are at the present time six sustaining associates.

Contributing associates are organizations, institutions, and agencies grouped in four categories. Fees and distributions of publications for each category are based on the nature and magnitude of transportation-related activities of the associate organization. The fees range from $250 to $1200 a year. There are currently 129 contributing associates affiliated with TRB.

In addition to organizational associates, the board invites applications for individual associateship from persons interested in transportation. There are two categories of individual affiliation: individual associate and student associate. At the present time there are more than 1800 individual associates.

SPONSORS

State highway and transportation departments
  Representatives listed under State, University, and Transit representatives
Federal Highway Administration
  Karl S. Bowers, representative
Urban Mass Transportation Administration
  Lillian C. Liburdi, representative
Federal Railroad Administration
  John McGrath Sullivan, representative
Federal Aviation Administration
  Langhorne M. Bond, representative
Association of American Railroads
  William J. Harris, Jr., representative

SUSTAINING ASSOCIATES

American Iron and Steel Institute
  Christopher Tyson, representative
The Asphalt Institute
  Vaugh Marker, representative
General Motors Corporation
  Betsy Ancker-Johnson, representative
3M Company
  J. C. Landen, representative
Portland Cement Association
  Gordon Ray, representative
Ministry of Transportation and Communications, Province of Ontario, Canada
  Alec G. Kelly, representative

CONTRIBUTING ASSOCIATES

Government Agency or Academic Organization

United States

Allegheny County Planning and Development Department, Pittsburgh, PA
Appalachian Regional Commission, Washington, DC
Automobile Club of Southern California, Los Angeles, CA
Bi-State Development Agency, St. Louis, MO
Broward County, Fort Lauderdale, FL
Calspan Corporation, Buffalo, NY
Capital City Railroad Relocation Authority, Springfield, IL
University of Central Florida, Orlando, FL
Central New York Regional Planning and Development Board, Syracuse, NY
City of Dallas, Dallas, TX
Delaware River Joint Toll Bridge Commission, Morrisville, PA
Denver Regional Council of Governments, Denver, CO
University of the District of Columbia, Washington, DC
East-West Gateway Coordination Council, St. Louis, MO
ENO Foundation for Transportation, Inc., Westport, CT
Evansville Urban Transportation Study, Evansville, IN
Fairfax County Division of Design Review, Fairfax, VA
U.S. Department of Agriculture Forest Service, Washington, DC
Hillsborough County Planning Commission, Tampa, FL
IIT Research Institute, Chicago, IL
Indiana University, Bloomington, IN
Jacksonville Transportation Authority, Jacksonville, FL
Lane Transit District, Eugene, OR
Lexington-Fayette Urban County Government, Lexington, KY
City of Lowell, Lowell, MA
Maryland National Capital Park and Planning Commission, Silver Spring, MD
University of Michigan, Ann Arbor, MI
Mid-America Regional Council, Kansas City, MO
Montgomery County Department of Transportation, Rockville, MD
City of Naperville, Naperville, IL
University of North Carolina, Highway Safety Research Center, Chapel Hill, NC
North Central Texas Council of Governments, Arlington, TX
Omaha-Council Bluffs Metropolitan Area Planning Agency, Omaha, NE
Omaha Metropolitan Area Transit, Omaha, NE
City of Omaha, Omaha, NE
City of Orlando, Orlando, FL
Pennsylvania Turnpike Commission, Harrisburg, PA
Prince George's County Department of Public Works and Transportation, Upper Marlboro, MD

Purdue University, West Lafayette, IN
South East Michigan Council of Governments, Detroit, MI
City of Sioux City, Sioux City, IA
Tennessee Valley Authority, Knoxville, TN
Texas A&M University, Texas Transportation Institute, College Station, TX
U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, NH
U.S. Department of Transportation, Transportation Systems Center, Cambridge, MA
VIA Metropolitan Transit, San Antonio, TX

Australia
Office of Road Safety, Melbourne, Victoria
Tasmania State Office Library, Hobart, Tasmania

Belgium
Centre de Recherches Routieres, Brussels

Canada
Research Council of Alberta, Edmonton, Alberta
Regional Municipality of Peel, Bramalea, Ontario
Saskatchewan Department of Highways and Transportation, Regina, Saskatchewan
Sudbury Transportation Department, Sudbury, Ontario

India
Ministry of Shipping and Transport, New Delhi

Italy
AISCAT, Rome

Republic of Korea
Korea Highway Corporation, Gyeong–Gi Do

Mexico
Secretaria de Asentamientos Humanos y Obras Publicas

South Africa
National Institute for Transportation and Railroad Research, Pretoria

Sweden
National Swedish Road Administration, Stockholm
Statens Vag– Och Trafikin, Linkoping

Private Organizations

United States
American Concrete Pipe Association, Vienna, VA
American Concrete Institute, Detroit, MI
American Concrete Pavement Association, Arlington Heights, IL
American Trucking Associations, Washington, DC
Armco, Inc., Middletown, OH
Ballenger Corporation, Greenville, SC
Commuter Transportation Services, Inc., Los Angeles, CA
Dow Chemical Company, Midland, MI
E. I. Du Pont de Nemours and Company, Wilmington, DE
Ford Motor Company, Dearborn, MI
Highway Users Federation for Safety and Mobility, Washington, DC
International Road Federation, Washington, DC
International Bridge, Tunnel, and Turnpike Association, Washington, DC
Lane Construction Corporation, Meriden, CT
LFE Corporation, East Norwalk, CT
National Slag Association, Alexandria, VA
National Crushed Stone Association, Washington, DC
National Sand and Gravel Association and National Ready-Mixed Concrete Association, Silver Spring, MD
Salt Institute, Alexandria, VA
Transpo-Safety, Inc., New Rochelle, NY
Institute of Transportation Engineers, Arlington, VA

Consultants

United States
Austin Tsutsumi and Associates, Inc., Honolulu, HI
ATE Management and Service Company, Cincinnati, OH
Balke Engineers, Cincinnati, OH
H. Bartholomew and Associates, Memphis, TN
Barton-Aschman Associates, Evanston, IL
Battelle-Northwest, Richland, WA
Bechtel, Inc., San Francisco, CA
Benham-Blair and Affiliates, Inc., Oklahoma City, OK
Louis Berger International, Inc., East Orange, NJ
Centennial Engineering, Inc., Arvada, CO
Charles River Associates, Boston, MA
Consoer Townsend and Associates, Chicago, IL
Daniel, Mann, Johnson, and Mendenhall, Los Angeles, CA
De Leuw, Cather and Company, Chicago, IL
Diaz Seckinger and Associates, Inc., Tampa, FL
E. S. Preston Associates, Inc., Columbus, OH
Edwards and Kelcey, Inc., Livingston, NJ
Greiner Engineering Sciences, Inc., Baltimore, MD
R. J. Hansen Associates, Inc., Rockville, MD
Henningson Durham and Richardson, Washington, DC
Hensley-Schmidt, Inc., Chattanooga, TN
Howard Needles Tammen and Bergendoff, Kansas City, MO
JHK and Associates, Emeryville, CA
Roy Jorgensen Associates, Inc., Gaithersburg, MD
KLD Associates, Inc., Huntington Station, NY
Arthur D. Little, Inc., Cambridge, MA
Modjeski and Masters, Harrisburg, PA
Multisystems, Inc., Cambridge, MA
Parsons, Brinckerhoff, Quade and Douglas, Seattle, WA
Peat, Marwick, Mitchell and Company, Washington, DC
Richardson Gordon and Associates, Pittsburgh, PA
RPPW, Inc., Tarrytown, NY
Rummel, Klepper, and Kahl, Baltimore, MD
Safety Management Institute, Bethesda, MD
Steinman, Boynton, Gronquist and London, New York, NY
Sverdrup Corporation, St. Louis, MO
Tippetts-Abbett-McCarthy-Stratton, New York, NY
Tudor Engineering Company, San Francisco, CA
Alan M. Voorhees and Associates, McLean, VA
Wertheim and Company, Inc., New York, NY
Wilbur Smith and Associates, Columbia, SC

Canada
CBA Engineering Ltd., Vancouver, British Columbia
Fenco Consultants Ltd., Toronto, Ontario
N. D. Lea and Associates Ltd., Vancouver, British Columbia
McCormik Rankin and Associates, Mississauga, Ontario

South Africa
Bruinette, Kruger, and Stoffberg, Pretoria
Geustyn, Forsyth, and Joubert, Alkantrant
Scott and De Waal, Inc., Saxonwold, Transvaal

STATE, UNIVERSITY, AND TRANSIT REPRESENTATIVES

Transportation Research Board representatives in state highway and transportation departments, educational institutions, and transit agencies provide continuing liaison between their organizations and TRB. The TRB representatives actually function as an arm of the board. The following persons were serving as state, university, and transit representatives as of July 1979.

State Highway and Transportation Departments

Alabama
Frank L. Holman, Jr.
Alaska
Doyle W. Ross
Arizona
Gene R. Morris
Arkansas
Billy K. Cooper
California
D. G. Pengilly
Colorado
Harvey R. Atchison
Connecticut
Charles E. Dougan
Delaware
Oscar L. Sebastian
District of Columbia
Bernard J. O'Donnell
Florida
Lawrence L. Smith
Georgia
Hugh L. Tyner
Hawaii
Terry Aratani
Idaho
James W. Hill
Illinois
Donald R. Schwartz
Indiana
Robert L. Eskew
Iowa
Bernard C. Brown
Kansas
John D. McNeal
Kentucky
W. B. Drake
Louisiana
E. J. Breckwoldt
Maine
Richard A. Luettich
Maryland
Nathan L. Smith, Jr.
Clyde E. Pyers
Massachusetts
Francis W. Holden
Michigan
Kent A. Allemeier
Minnesota
Frederick W. Thorstenson
Mississippi
T. C. Paul Teng
Missouri
William L. Trimm
Montana
Thomas E. Martin
Nebraska
Derald S. Kohles
Nevada
George B. Westenhoefer
New Hampshire
Philip E. McIntyre
New Jersey
Eugene F. Reilly
New Mexico
Arthur G. DeLong
New York
William P. Hofmann
North Carolina
W. F. Caddell, Jr.
North Dakota
Robert T. Peterson
Ohio
Leon O. Talbert
Oklahoma
C. Dwight Hixon
Oregon
Fred B. Klaboe
Pennsylvania
Replacement pending
Rhode Island
Joseph G. Arruda
South Carolina
Richard L. Stewart
South Dakota
William T. Voss
Tennesse
Paul D. Edens
Texas
Robert L. Lewis
Utah
David K. Miles
Vermont
Roy F. Nicholson
Virginia
Jack H. Dillard
Washington
Robert S. Nielsen
West Virginia
Fred VanKirk
Wisconsin
Karl H. Dunn
Wyoming
James R. Vandel
Puerto Rico
Francisco A. Carrero

Academic Institutions

Alabama
Raymond K. Moore, Auburn University
John D. Antrim, University of Alabama
J. H. Appleton, University of Alabama in Birmingham
Alaska
John L. Burdick, University of Alaska
Arizona
Judson S. Matthias, Arizona State University
Rudolf A. Jiminez, University of Arizona
Arkansas
E. Walter LeFevre, University of Arkansas
California
Ronald F. Scott, California Institute of Technology
Blaine Vogen, California State Polytechnic University
Robert L. Alexander, California State University
Thomas M. Taylor, Joint Center for Transportation Studies
James H. Banks, San Diego State University
Thomas G. Schultz, San Jose State College
Vincent Roggeveen, Stanford University
P. K. Mehta, University of California, Berkeley
Tenny N. Lam, University of California, Davis
Gordon J. Fielding, University of California, Irvine
Frederick L. McGuire, University of California–Irvine Medical Center
Martin Wachs, University of California, Los Angeles
Herold A. Sherman, University of Southern California
Colorado
James G. Johnstone, Colorado School of Mines
Daryl B. Simons, Colorado State University
Ralph E. Williams, University of Denver
Connecticut
Jack E. Stephens, University of Connecticut
Delaware
T. W. Brockenbrough, University of Delaware
District of Columbia
Henry Malcolm Steiner, George Washington University
Delon Hampton, Howard University
Philip L. Brach, University of the District of Columbia, Van Ness Campus
Florida
Brett Klecka, Florida International University
Walter H. Zimpfer, University of Florida
W. J. Fogarty, University of Miami

Georgia
Sid Davis, Atlanta University
Paul H. Wright, Georgia Institute of Technology
Hawaii
C. S. Papacostas, University of Hawaii
Idaho
Robert P. Lottman, University of Idaho
Illinois
J. E. Bowles, Bradley University
Donald S. Berry, Northwestern University
James E. Aaron, Southern Illinois University
Moreland Herrin, University of Illinois at Urbana-Champaign
Indiana
George M. Smerk, Indiana University
Harold L. Michael, Purdue University
Cecil T. Lobo, Rose-Hulman Institute of Technology
James I. Taylor, University of Notre Dame
Iowa
R. L. Carstens, Iowa State University
John W. Fuller, University of Iowa
Kansas
Bob L. Smith, Kansas State University
Joe Lee, University of Kansas
Kentucky
William A. Browne, Eastern Kentucky University
John W. Hutchinson, University of Kentucky
Louisiana
Olin K. Dart, Jr., Louisiana State University and Agricultural and Mechanical College
William O. Hadley, Louisiana Tech University
John L. Niklaus, Tulane University
Maine
George W. Greenwood, University of Maine
Maryland
Everett C. Carter, University of Maryland
Massachusetts
Gary R. Fauth, Harvard University
Daniel Roos, Massachusetts Institute of Technology
Richard J. Scranton, Northeastern University
Richard L. Savage, Tufts University
Paul W. Shuldiner, University of Massachusetts
Richard D. Desrosiers, Worcester Polytechnic Institute
Michigan
William C. Taylor Michigan State University
Eugene Y. Huang, Michigan Technological University
Warren J. Baker, University of Detroit
Donald E. Cleveland, University of Michigan
Tapan Datta, Wayne State University
Minnesota
Eugene L. Skok, Jr., University of Minnesota
Mississippi
James W. Epps, Mississippi State University
Samuel L. DeLeeuw, University of Mississippi
Missouri
Robert Ulrich, Central Missouri State University
David L. Guell, University of Missouri at Columbia
Joseph H. Senne, University of Missouri at Rolla
Lonnie E. Haefner, Washington University
Montana
Alfred C. Scheer, Montana State University
Replacement pending, University of Montana
Nebraska
Edward Robert Post, University of Nebraska
Nevada
Charles R. Breese, University of Nevada
New Hampshire
Thomas J. Adler, Dartmouth College
Replacement pending, University of New Hampshire
New Jersey
Paul Michael Lion, Princeton University
Edward G. Nawy, Rutgers, State University of New Jersey
I. Robert Ehrlich, Stevens Institute of Technology
New Mexico
Kenneth R. White, New Mexico State University
Cornie L. Hulsbos, University of New Mexico
New York
Ming L. Pei, City College–City University of New York
Feng-Bor Lin, Clarkson College of Technology
Gordon P. Fisher, Cornell University
Joseph J. Breen, Manhattan College
Louis J. Pignataro, Polytechnic Institute of New York
Larry J. Feeser, Rensselaer Polytechnic Institute
Robert E. Paaswell, State University of New York at Buffalo
Thomas J. Thomas, St. John's University
Paul J. Brennan, Syracuse University
North Carolina
Aleksandar Sedmak Vesic, Duke University
Arthur Saltzman, North Carolina A&T State University
W. Grigg Mullen, North Carolina State University at Raleigh
Gorman Gilbert, University of North Carolina at Chapel Hill
L. Ellis King, University of North Carolina at Charlotte
North Dakota
James L. Jorgenson, North Dakota State University
Oscar E. Manz, University of North Dakota
Ohio
Fred Moses, Case Western Reserve University
Clarence H. C. James, Cleveland State University
Robert H. Keyser, Ohio Northern University
Eldridge A. Whitehurst, Ohio State University
Edward G. Russ, Ohio University
David H. Timmerman, University of Akron
Robert T. Howe, University of Cincinnati
David C. Colony, University of Toledo
Oklahoma
Robert L. Janes, Oklahoma State University
Joakim G. Laguros, University of Oklahoma
Oregon
Robert Davis Layton, Oregon State University
Pennsylvania
Richard G. McGinnis, Bucknell University
James P. Romualdi, Carnegie-Mellon University
Daniel R. Fredland, Drexel University
David A. Van Horn, Lehigh University
William H. Gotolski, Pennsylvania State University
Vukan R. Vuchic, University of Pennsylvania
Joel I. Abrams, University of Pittsburgh
Edward M. Wallo, Villanova University
George N. Bathish, Widener College
Rhode Island
Kendall Moultrop, University of Rhode Island

South Carolina
J. Edwin Clark, Clemson University
Robert R. Roberts, University of South Carolina
South Dakota
R. Norman Orava, South Dakota School of Mines and Technology
Emory E. Johnson, South Dakota State University
Norman Heimstra, University of South Dakota
Tennessee
Martin E. Lipinski, Memphis State University
Frank M. Holloway, Tennessee Technological University
Wm. A. Goodwin, University of Tennessee
Peter G. Hoadley, Vanderbilt University
Texas
Carl P. Sharpe, Rice Center for Community Design and Research
Cecil H. Smith, Southern Methodist University
Charles J. Keese, Texas A&M University
Joseph E. Minor, Texas Tech University
Ardis White, University of Houston
John J. Haynes, University of Texas at Arlington
Clyde E. Lee, University of Texas at Austin
Utah
W. Don Budge, Brigham Young University
Clifford G. Bryner, University of Utah
Reynold K. Watkins, Utah State University
Vermont
Kenneth M. Kidd, Norwich University
Joseph C. Oppenlander, University of Vermont
Virginia
Lester A. Hoel, University of Virginia
J. A. McDonough, Virginia Military Institute
Richard D. Walker, Virginia Polytechnic Institute and State University
Washington
Ronald L. Terrel, University of Washington
John C. Cook, Washington State University
West Virginia
Lyle K. Moulton, West Virginia University
Wisconsin
William G. Murphy, Marquette University
Herman A. Kuhn, University of Wisconsin–Madison
Edward Beimborn, University of Wisconsin–Milwaukee
James R. Levey, University of Wisconsin–Platteville
Wyoming
Donald R. Lamb, University of Wyoming
Puerto Rico
Jose Vega-Ortiz, University of Puerto Rico
Canada
J. J. Bakker, University of Alberta
V. Setty Pendakur, University of British Columbia
Merritt M. Davis, University of Toronto
India
O. P. Jain, University of Roorke
Japan
Masaki Koshi, University of Tokyo
Mexico
Santiago Corro Caballero, University of Mexico
Philippines
Manuel C. Jabson III, University of the Philippines

Transit

California
Bay Area Rapid Transit District, Oakland
Ward D. Belding, Jr.
Golden Gate Bridge, Highway and Transportation District, San Francisco
Jerome M. Kuykendall
Southern California Rapid Transit District, Los Angeles
Richard Gallagher
San Diego Transit Corporation
T. O. Prior
San Francisco Municipal Railway
Buford C. Johnson
Colorado
Regional Transportation District, Denver
John D. Simpson
District of Columbia
Washington Metropolitan Area Transit Authority
William I. Herman
Florida
Jacksonville Transportation Authority
Frederick W. Bowman
Metropolitan Dade County, Miami
Woodrow L. Moore, Jr.
Georgia
Metropolitan Atlanta Rapid Transit Authority
John W. Bates
Illinois
Chicago Transit Authority
Harold R. Hirsch
Indiana
Indianapolis Public Transportation Corporation
William E. Bell
Kentucky
Transit Authority of River City, Louisville
Robert S. Carhart
Maryland
Mass Transit Administration, Baltimore
Louis R. Rainone
Massachusetts
Massachusetts Bay Transportation Authority
Ronald J. Tober
Minnesota
Metropolitan Transit Commission, St. Paul
Philip H. Braum
Missouri
Bi-State Development Agency–Transit, St. Louis
Edward A. Madison
Nebraska
Transit Authority of the City of Omaha
Jerome T. Erdman
New York
Capital District Transportation Authority, Albany
Jack Reilly
Niagara Frontier Transportation Authority, Buffalo
Vito J. Sportelli
Port Authority Trans-Hudson Corporation, New York
James E. Dreyer

Ohio
- Central Ohio Transit Authority, Columbus
  - James E. Reading
- Greater Cleveland Regional Transit Authority
  - J. Dan Jones
- Miami Valley Regional Transit Authority, Dayton
  - R. B. Shaffer
- Queen City Metro, Cincinnati
  - Linda S. Hunkins

Oregon
- Tri-Met, Portland
  - Paul N. Bay

Pennsylvania
- Port Authority of Allegheny County, Pittsburgh
  - J. Harold Norris

Puerto Rico
- Metropolitan Bus Authority, Hato Rey
  - Merbil Gonzalez-Martinez

Texas
- National City Management Company, Houston
  - D. N. Lambert

Washington
- Municipality of Metropolitan Seattle
  - David L. Kalberer

Wisconsin
- Madison Department of Transportation
  - Warren O. Somerfeld
- Milwaukee Transport Services, Inc.
  - Galen C. Larson

STATEMENT OF INCOME AND EXPENDITURES FOR FISCAL YEAR ENDING JUNE 30, 1979
(modified cash basis)

Income by Sources During Fiscal Year 1979

	Federal	State	Other	Total
Technical Activities Program				
Research Correlation Service (state highway and transportation departments)		$1 552 600		$1 552 600
Federal Highway Administration	$ 654 588			654 588
Urban Mass Transportation Administration	320 341			320 341
Office of the Secretary of Transportation	4 432			4 432
Federal Railroad Administration	212 261			212 261
Federal Aviation Administration	180 047			180 047
National Highway Traffic Safety Administration	65 652			65 652
Agency for International Development	255 329			255 329
Congressional Budget Office	24 401			24 401
Maritime Administration	170 365			170 365
Farmers Home Administration	2 872			2 872
Association of American Railroads			$ 105 416	105 416
Dues from Organizational & Individual Affiliates			266 696	266 696
Library Subscriptions			92 781	92 781
Publication Sales			176 071	176 071
Registration Fees			113 980	113 980
Highway Research Information Service			15 071	15 071
National Academy of Sciences			78 000	78 000
Miscellaneous			8 544	8 544
Special fund[a]			173 599	173 599
Subtotal	1 890 288	1 552 600	1 030 158	4 473 046
National Cooperative Highway Research Program				
State highway and transportation departments[b]		4 616 976		4 616 976
Publication sales			43 430	43 430
Subtotal		4 616 976	43 430	4 660 406
All programs				
Total income[c]	$1 890 288	$6 169 576	$1 073 588	$9 133 452

[a] The sum of $173 599 was transferred from the special fund to cover deficit balance incurred for FY 1979. This amount came from FY 1977 income from other than federal or state sources to be used for expenditures in FY 1978 and FY 1979 as provided under a three-year fixed-income budget plan approved by the major sponsors, November 28, 1966.

[b] The National Cooperative Highway Research Program is supported through independent contracts between the National Academy of Sciences and each of the 50 state highway and transportation departments, Puerto Rico, and the District of Columbia, by agreements with the Federal Highway Administration, U.S. Department of Transportation, permitting use of allocated federal-aid highway planning and research (HPR) funds.

[c] The difference between Total Income and Total Expenditures (see last lines of tables on facing page)—$28 021—is held to help defray the cost of proceedings of conferences held in FY 1979 and FY 1980.

Expenditures by Activity During Fiscal Year 1979

	Federal	State	Other	Total
Technical Activities Program				
Field visit program	$ 226 200	$ 403 780	$ 247 200	$ 877 180
Committee activities	94 250	139 770	154 500	388 520
Annual Meeting, conferences, and workshops	513 382	295 070	188 279	996 731
Publications	264 756	450 370	267 958	983 084
Computer-based information services	791 700	263 610	144 200	1 199 510
Subtotal	$1 890 288	$1 552 600	$1 002 137	$4 445 025
National Cooperative Highway Research Program				
Administration, surveillance, and publication		1 105 882	37 449	1 143 331
Contract research (flow-through)		3 059 238		3 059 238
In-house TRB research		451 856	5 981	457 837
Subtotal		4 616 976	43 430	4 660 406
All Programs				
Total Expenditures	$1 890 288	$6 169 576	$1 045 567	$9 105 431

Expenditures by Object Class During Fiscal Year 1979

Technical Activities Program				
Salary and related benefits	$ 858 177	$ 745 248	$ 432 549	$2 035 974
Overhead	389 287	341 572	198 230	929 089
Travel	191 924	93 156	84 135	369 215
Communications and shipping	42 018	46 578	31 572	120 168
Materials and services	93 606	46 578	41 261	181 445
Data processing	39 621	31 052	25 895	96 568
Printing and duplicating	137 417	139 734	115 044	392 195
General and administrative costs	138 238	108 682	73 451	320 371
Subtotal	$1 890 288	$1 552 600	$1 002 137	$4 445 025
National Cooperative Highway Research Program				
Salary and related benefits		653 392		
Overhead		294 027		
Travel		132 717		
Communications and shipping		33 461		
Materials and services		67 458		
Data processing		12 527		
Printing and duplicating		196 846	43 430	
Subcontracts		2 866 653		
General and administrative costs		359 895		
Subtotal		4 616 976	43 430	4 660 406
All Programs				
Total Expenditures	$1 890 288	$6 169 576	$1 045 567	$9 105 431

Special Fund

In 1965 TRB established a fund to provide for orderly adjustments in the event of temporary shortfall in anticipated revenue. The fund was built up during the years from unanticipated surpluses from over-the-counter publication sales, by instituting economies in printing and other operations, and from interest from investments. No federal funds have been involved. The TRB Executive Committee has stipulated that the total amount of the fund shall not exceed one-half the annual budget for regular technical activities. The fund is maintained to meet TRB short-term commitments in the event of loss of primary support and to provide for program initiatives authorized by the Executive Committee.

Fund balance June 30, 1978		$1 373 850
Expenditures in FY 1979:		
Consultant—encumbrance	$ 21 288	
Fund close out FY 1978	3 986	
Close out FY 1979	173 599	
Albert Einstein Memorial contribution	5 000	
Federal Highway Administration contract adjustment	236 349	440 222
Balance June 30, 1979		$ 933 628

TRANSPORTATION RESEARCH BOARD
National Academy of Sciences
2101 Constitution Avenue, N.W., Washington, D.C. 20418

Address Correction Requested

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DIVISION OF RESEARCH
AND DEVELOPMENT