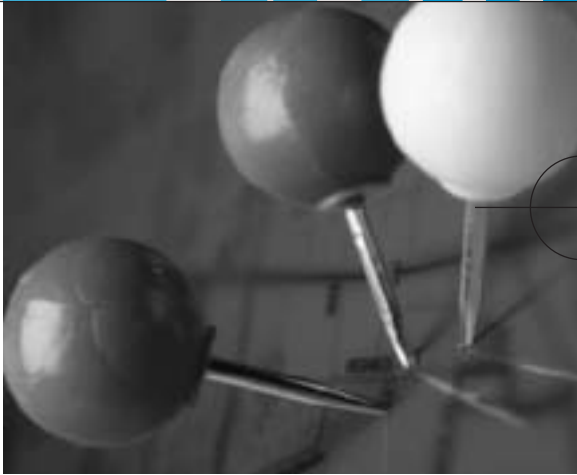


# EARMARKING

## IN U.S. DEPARTMENT OF TRANSPORTATION RESEARCH PROGRAMS



### *What Is the Rationale? What Are the Risks?*

MARTIN WACHS AND ANN BRACH

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The federal government has long supported transportation research and innovation. The introduction of materials, improvements in design, protection of the environment, and innovations in travel safety depend on the continuous development of new knowledge and on the objective evaluation of projects and programs.

The U.S. Department of Transportation (DOT) has funded research into highway, transit, aviation, rail, and marine applications. U.S. DOT research programs are carried out by the department's staff and by private and academic institutions that typically compete for awards based on merit and experience.

In the past 10 to 15 years, however, transportation research programs have experienced a dramatic growth in earmarking—that is, in Congressional legislation specifying that research centers, projects, or studies should be located at particular institutions. Between 1995 and 2003, earmarking increased from about 1 percent of the department's research budget to about 14 percent (Figure 1). This level of earmarking, however, is modest compared with the situation faced

by some agencies within U.S. DOT and by programs within the agencies.

### Elements of Earmarking

A Congressional earmark designates three elements: a research area or project, a funding amount, and a recipient—that is, an institution that will perform the research. The last element, the recipient of the funds, is the most critical and yet the most ambiguous.

Congress may designate a recipient in several ways. The clearest is to name the recipient in the legislation or in an accompanying report. Although a report does not have the force of law, agencies generally treat report designations as binding.

In other cases, the recipient is not named, but the law or report language is so restrictive that only one recipient can meet the criteria. In yet other cases, Congress uses informal channels to make known to an agency the intended recipient of the funds. The effect is the same—the agency knows it must provide a certain amount of funding to a particular recipient to avoid repercussions, perhaps in future appropriations.

Research earmarks differ from earmarks for highway and other public works projects. Construction earmarks account for less than 10 percent of highway program funds; by contrast, earmarks of research programs in some cases account for 40 percent to 90 percent of a research budget. Construction earmarks do not designate engineering and construction firms, but research earmarks designate research institutions. Construction projects must meet planning, engineering, and environmental requirements and standards, but earmarked research is not subject to

*In response to concerns about the increased earmarking of funds for transportation research programs, the TRB Executive Committee requested a white paper presenting data and perspectives on research earmarking. This article is an abbreviated version of the white paper, which has been published in full in a research journal (1).*

*NOTE: This article was in production when Congress passed the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Preliminary analysis indicates that earmarking levels in SAFETEA-LU are higher than in previous authorizations. An article in an upcoming TR News will examine in detail the research provisions in SAFETEA-LU.*

the competition and merit review standards that ordinarily would be applied.

### Competition and Peer Review

Discussion about earmarking must consider the principle that the competitive award of funding through the judgment of scientific peers is the best way to ensure high-quality research. Expert judgment is needed to assess the character of the research, which is a quest for new knowledge and for solutions to unsolved problems. In many cases this high degree of expertise is shared by a small number of colleagues who have a similar education and similar research or technical experience.

Quality assurance is part of the culture of science. Research should be as free as possible from political or other extraneous influences, to preserve the reliability, accuracy, and objectivity of the results. Although science may be subject to the same types of influences as other enterprises, the ideal of minimizing nonscientific impacts on scientific results remains a central tenet of research culture.

Legislative bodies always have designated research funds for particular purposes, such as traffic safety, pavement improvement, or transportation demand management, but historically the selection of the researchers has been left to peer review. Review processes, like those of the National Science Foundation and the National Institutes of Health, incorporate measures to avoid awarding funds on the basis of friendships, influence, political connections, or lobbying.

Widely circulated announcements encourage researchers to study and solve particular problems. Experts in the field anonymously review the proposals and budgets prepared by other researchers and recommend selection of the most promising. Although most federally funded research is conducted through open competition, the increasing share of earmarked research funding bypasses these processes (3). This trend warrants careful analysis and interpretation.

### Earmarking in U.S. DOT Research Programs

To assess the extent of earmarking in U.S. DOT programs, data were gathered from five U.S. DOT agencies, representing 85 percent of the department's research budget from fiscal year (FY) 2000 through FY 2004.

#### Federal Highway Administration

In FY 1997, the last year before the Transportation Equity Act for the 21st Century (TEA-21), approximately 12 percent of the Federal Highway Administration's (FHWA) research and technology (R&T) deployment programs were earmarked by authorization and appropriations legislation. With the passage

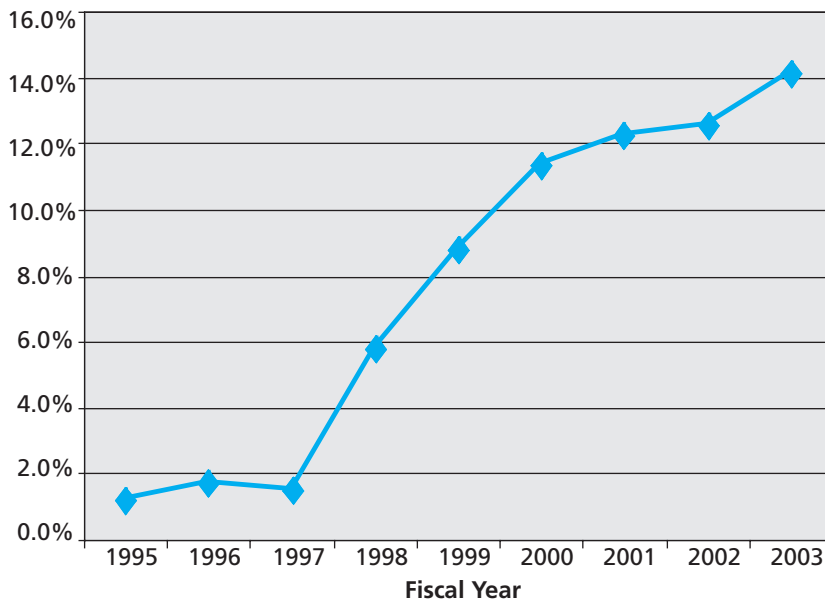


FIGURE 1 Earmarks as a percent of U.S. DOT R&T program (2). Source: U.S. DOT budget tables.



FHWA's Turner-Fairbank Highway Research Center, McLean, Virginia, and demonstration of testing procedure in one of the facility's laboratories. (Photos courtesy of FHWA.)



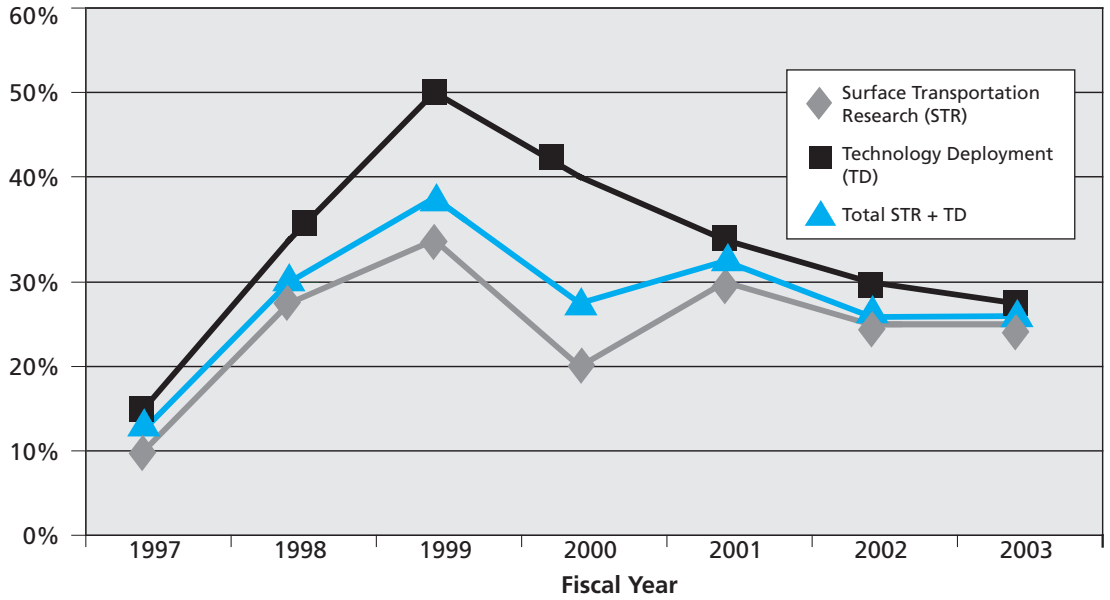


FIGURE 2 Earmarks as a percent of FHWA's R&T program (with limitations applied). Source: FHWA budget tables.

of TEA-21, authorization earmarks alone increased to almost 19 percent of R&T funding. Adding earmarks from the annual appropriations process, the average level of earmarking during the TEA-21 years reached 33 percent of the R&T program.

The impact was reduced in FY 1999, 2000, and 2001 (Figure 2), as appropriators agreed to specify the earmarks up to a certain amount. This allowed FHWA to maintain minimum research operations in critical areas and to keep core laboratories open at the Turner-Fairbank Highway Research Center. Without this agreement, 45 percent of FHWA's research pro-

gram would have been earmarked in 1999 and 2001.

Under TEA-21, 29 percent of FHWA's R&T program was earmarked: 26 percent of the research portion of the program and 35 percent of the portion for technology deployment. Average earmarking during the 6-year period, however, masks the dramatic impact on some parts of the R&T program. Structures, pavement, and safety programs received more earmarks than research in policy, environment, and planning.

In FY 1999, for example, 65 percent of FHWA's structures research program was earmarked. In the same year, the pavement research program received an

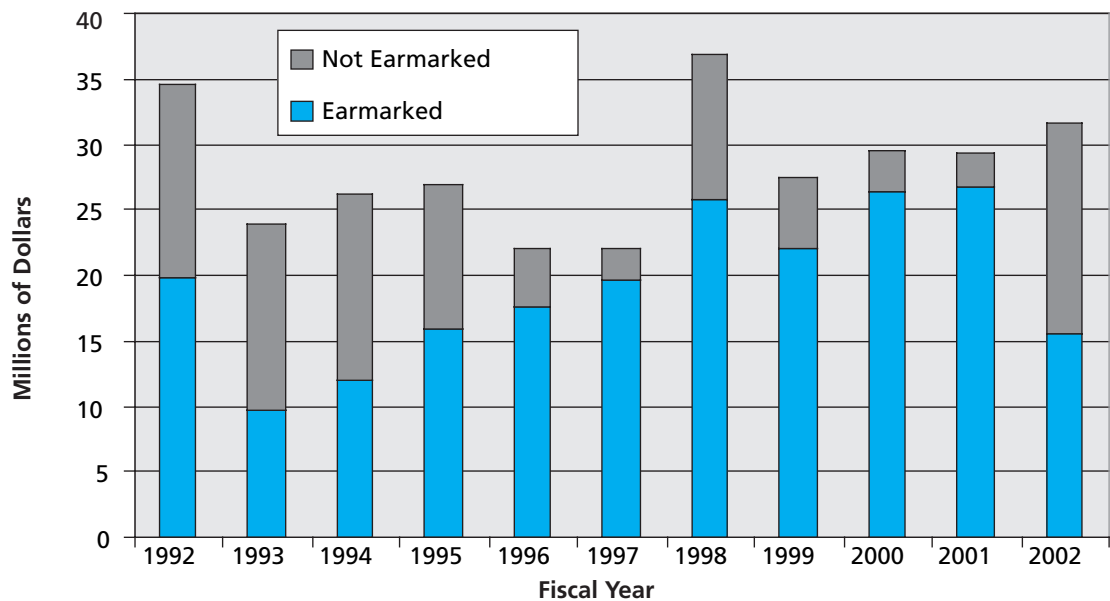


FIGURE 3 Earmarks as a percent of FTA's R&T program, FY 1992–FY 2002. Source: FTA.

appropriation of \$11.6 million but was expected to accommodate \$14 million worth of authorization and appropriations earmarks. Over the course of TEA-21, the technology deployment program dealt with annual earmarks ranging from 26 percent to 54 percent.

**Federal Transit Administration**

Earmarking levels in the Federal Transit Administration’s (FTA) R&T program have been high for more than a decade. From FY 1992 though FY 2002, the degree of earmarking ranged from about 40 percent of the total research program to 90 percent (Figure 3), leaving the agency with little discretion in managing its R&T program.

FTA’s earmarks contrast sharply with FHWA’s. Earmarks in highway research are almost entirely for research and almost all are directed to universities; FTA earmarks, however, display more diversity in the activities funded and in the recipients. Between FY 1992 and FY 2004, 14 percent of earmarked R&T funding went to research activities, and half of the funding was directed to activities associated with testing or implementing new technologies.

The remainder of the earmarks appear to fund planning or program implementation. A substantial number of projects (33 of 109) were planning studies for bus, rail, and other transit initiatives in particular locales, although these projects only consumed 6 percent of the earmarked funding. Similarly, community-oriented projects—such as programs to provide access to jobs or transportation for senior citizens—accounted for 7 percent of the earmarked funding. In the “other or uncertain” category are R&T program

earmarks to fund the purchase of equipment, the construction of facilities, or operations.

As might be expected from the relatively small amount of funds earmarked for research, universities represent a small percentage of earmark recipients (9 percent). In contrast, local jurisdictions, transit authorities, and a few states comprise nearly half of the earmark recipients for planning studies, technology implementation projects, and projects to fund operations, equipment, or facilities.

Private organizations—often industry associations or private research institutions—receive about 30 percent of earmarked R&T funding. Some of these earmarks were for research, a few for training or standards development, and several for development and testing of new technology.

**Federal Aviation Administration**

Before 1998, few earmarks affected the Federal Aviation Administration’s (FAA) research program. Earmarking then rose significantly, from less than \$10 million per year to \$30 million or more (Figure 4). Beginning in the mid-1990s, FAA’s total research appropriation began to fall, so that the increased earmarking has had a greater impact on the program, rising from less than 5 percent to between 13 percent and 27 percent.

All FAA earmarks appear to be for R&T development; however, the recipients are not necessarily universities. Between FY 1990 and FY 2004, of the 89 earmarks from FAA’s program, 25 went to universities, 6 to airports, and 1 to a state DOT. The largest number of earmarks, 42, went to private laboratories, research centers, and consortia of industry and other

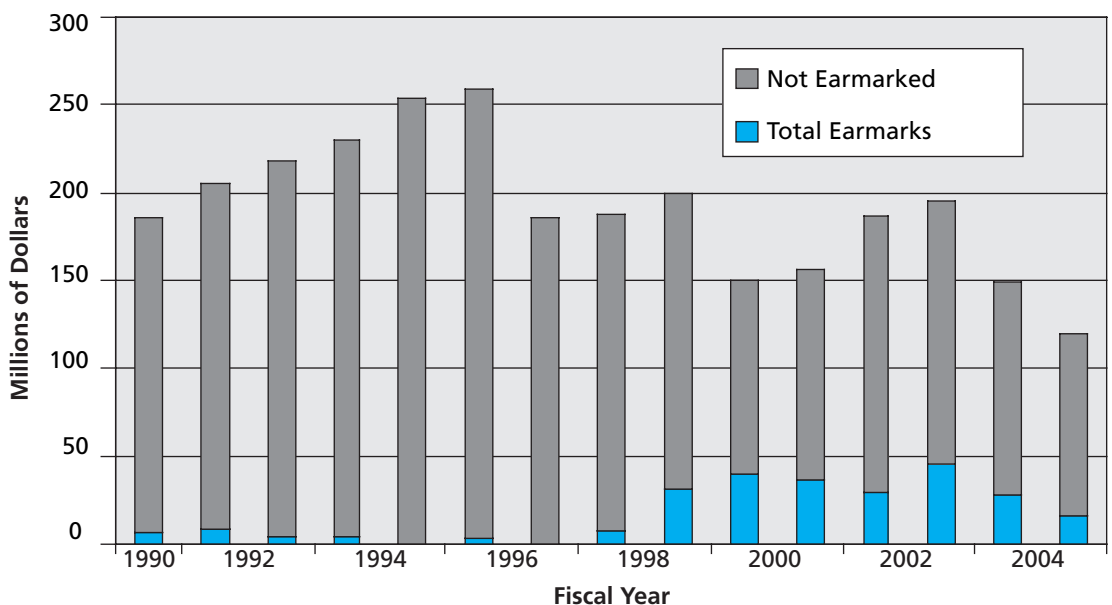


FIGURE 4 Earmarking in FAA’s research program. Source: FAA; 1991 data only include earmarks from House Appropriations Committee.

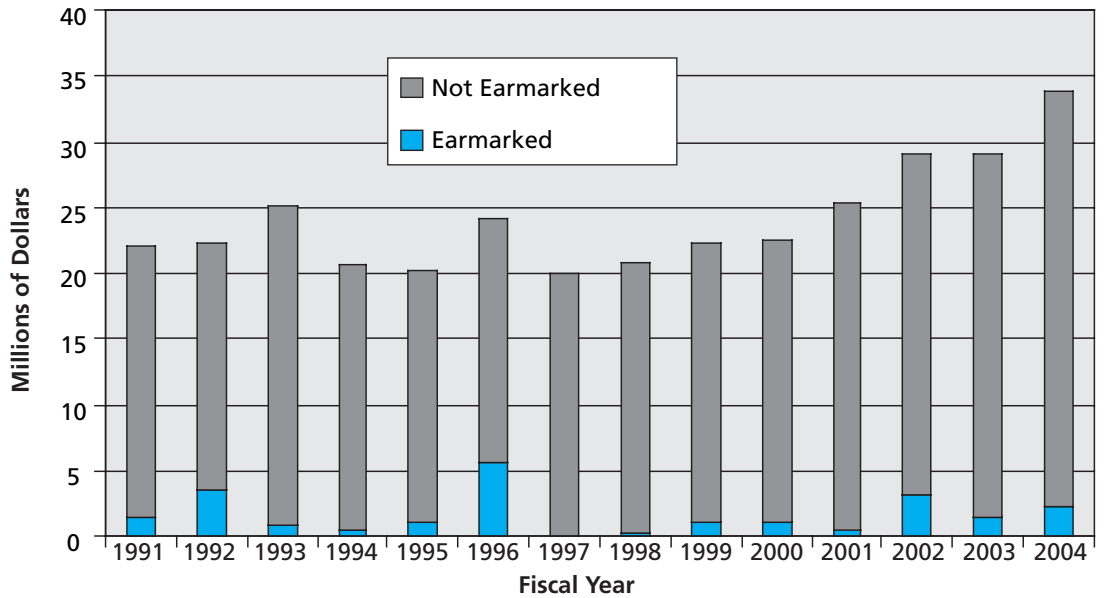


FIGURE 5 Earmarking in FRA's research program. Source: FRA funding table.

institutions. A significant class of recipients, however, consisted of federal agencies or laboratories, which received 15 earmarks.

**Federal Railroad Administration**

The Federal Railroad Administration's (FRA) research appropriations have been subject to a lower level of earmarking than those of FHWA and FTA. From FY 1991 through FY 2004, earmarking usually affected less than 10 percent of the program, rising to 16 percent in FY 1992 and to 23 percent in FY 1996 (Figure 5). Of the 24 earmarked activities, only three lasted more than 1 year, with never more than four earmarks in any year.

Most of the FRA earmarks were for research, often by universities; some were for planning or design studies. The data do not include the Next Generation High-Speed Rail Program, with annual funding of about \$20 million to \$30 million, nearly all of which has been earmarked in recent fiscal years.

**University Transportation Centers**

The University Transportation Centers (UTC) program, administered by the U.S. DOT's Research and Innovative Technology Administration (RITA), fosters the development of transportation professionals and researchers by funding research at universities.

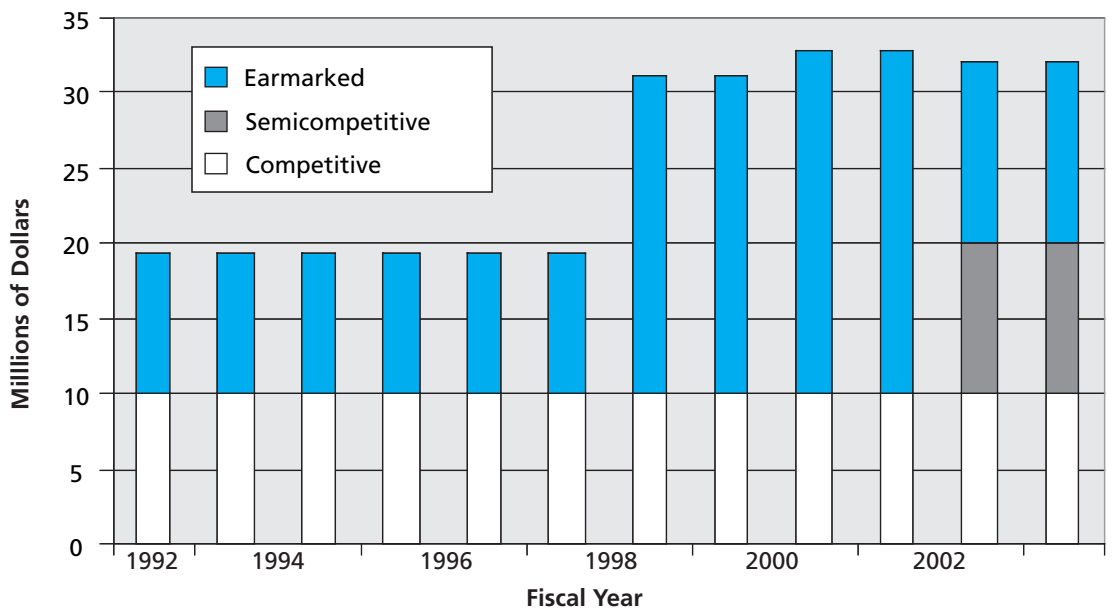


FIGURE 6 Earmarking in the UTC Program. Source: RITA.

## Open Discussion on Earmarking

In October 2004, the Transportation Research Board (TRB) convened a meeting to discuss transportation research earmarking. Participants included university researchers, congressional staff, and representatives of U.S. Department of Transportation (DOT) programs, transportation agencies, and industry associations.

The participants reviewed the data presented in a white paper (7), heard presentations from experts on research earmarking, and discussed the reasons for and concerns about the practice. The session was not convened to produce consensus positions; discussion points included the following:

- ◆ Some participants maintained that earmarks help to achieve policy goals, such as education, longer-term research, entry into new areas, support for minorities, and the redirection of unresponsive programs. Others countered that earmarks are not the best ways to achieve some of these goals.

- ◆ Some expressed concern that reducing competition and peer review leads to mediocre research. In addition, high levels of earmarking impede an agency's ability to manage its program, attract talented staff, and respond to emerging opportunities.

- ◆ Several participants stated that



transportation research funding is inadequate, particularly for investigator-driven, longer-term, and more fundamental research, for which universities are well suited. With earmarking, universities may bypass competitive processes to gain more reliable funding flows with fewer stipulations. As a result, however, fewer resources are available for competition, which in turn sparks more lobbying for earmarks.

- ◆ Many participants noted that U.S. DOT research programs should engage in more stakeholder involvement, strategic planning, performance measurement, and marketing of research benefits. These practices may lead to constituent support for more competitive programs and perhaps for larger research budgets.

*Participants in the discussion about legislative earmarking included (left to right) William W. Millar, American Public Transportation Association; Richard F. Marchi, Airports Council International–North America; Peter Ruane, American Road and Transportation Builders Association; Anthony Kane, American Association of State Highway and Transportation Officials; Dennis Judycki, Federal Highway Administration; and Michael D. Meyer, Georgia Institute of Technology.*



*Eric Webster, U.S. House of Representatives Committee on Science, addresses a point to Barbara Sisson, Federal Transit Administration, and Michael S. Townes, Hampton Roads Transit and then-Chair of TRB Executive Committee.*



*Earmarking discussion attracted a range of distinguished participants.*



PHOTO: SOUTHWEST REGION UTC CONSORTIUM

Students collaborate on project funded by University Transportation Centers program.

From FY 1992 through FY 2003, 10 centers—one for each federal region of the country—have received competitive awards every few years (competed and earmarked awards are shown in Figure 6). These regional centers are consortia of several universities with one serving as the lead. The remainder of the UTC

program funding is earmarked to individual universities or consortia.

In the fourth year of TEA-21, 17 earmarked centers competed and 10 were awarded funding for the last 2 years of the authorization cycle. These account for the semicompetitive portion of the program for FY 2002 and FY 2003 (Figure 6).

The rationale of regional distribution for the 10 centers is to ensure professional capacity building in transportation throughout the country, responding to concerns about the availability of a qualified workforce. This rationale, however, also can justify earmarks to universities in areas with particular needs for transportation professionals or with student populations underrepresented in transportation.

Before TEA-21, the UTC program was small, and few questioned that nearly 50 percent of the program was earmarked. Under TEA-21, the program grew by approximately 60 percent, and earmarking rose to 70 percent of the program; at the same time, university earmarks significantly increased under FHWA. As a result, UTCs received more attention, and expectations rose for useful research and the training of professionals.

### Driving Forces

Institutions have sought direct congressional designations of research funds for several reasons:

- ◆ *The traditional peer review process is perceived as biased toward established, prestigious universities.* Advocates claim that earmarking creates a level playing field and improves the competitive performance of less prestigious institutions (4). Nevertheless, well-established programs also receive earmarks (3).

- ◆ *Facilities are necessary for an institution to compete in certain research areas but federal funding of research facilities is considered inadequate.* Some U.S. DOT earmarks have paid for the development of research facilities, but most have not.

- ◆ *U.S. DOT funding of investigator-driven research is inadequate.* Because U.S. DOT's mission-

driven programs provide little opportunity for researcher-initiated work, universities may seek earmarks related to the interests of faculty. Some evidence supports this concern—in FY 1995, approximately 10 percent of U.S. DOT research funding went to universities (5), compared with 22 percent of all federal research funds (6).

- ◆ *Competition may be inappropriate in special cases that involve classified research or that require unique institutional qualifications.* Data were not available, but anecdotal evidence suggests that these cases account for a small portion of U.S. DOT research funding.

- ◆ *Agency programs are perceived as nonresponsive or insular.* Some nonacademic stakeholders have used earmarks to direct agency research to their interests or to influence agency programs that have relatively little external input or review. At least one major transportation stakeholder group has used this strategy in working with a U.S. DOT agency.

### Noteworthy Risks

Earmarking raises some risks in the quality and the management of research:

- ◆ *Earmarking may push universities' energies in the wrong direction.* Competition encourages researchers to prepare innovative, well-documented, and persuasive proposals for judging by scientific and technical experts. The focus is on the transportation problem and on the research or technological approaches that promise the best solutions.

Writing research proposals, reviewing proposals, evaluating alternative research designs, and examining the credentials of faculty members are practices that broaden knowledge about the topics and advance the state of the art. Earmarking, in contrast, relies on lobbying, which focuses on the relative power of members of Congress (7) and on the benefits—such as jobs and other impacts on the local economy—that will accrue to a legislator's jurisdiction.

- ◆ *Earmarking can adversely affect mission-oriented research.* Each U.S. DOT agency directs R&T toward the fulfillment of its mission. When a substantial portion of the research budget is earmarked, an agency has difficulty supporting its mission with research. Earmarks typically are designated without regard for research plans and sometimes without consideration of an agency's mission. Even when the earmarks are for relevant research and the researchers are responsive, agencies lose the ability to prioritize, to manage, and to respond to emerging needs and opportunities.

As noted earlier, earmarking threatened the continuation of basic laboratory functions at FHWA. After

the terrorist attacks of September 11, 2001, FTA was unable to redirect funding to security research, because 90 percent of its research budget was earmarked. High levels of earmarking also leave an agency with few resources for the ancillary activities needed to achieve technological objectives, such as prototype development, testing and evaluation, technology transfer, coordination, and information sharing.

◆ **Earmarking reduces accountability for the expenditure of public funds.** When an agency chooses a researcher competitively, a contract often specifies the deliverable—that is, the required product. Non-performance can result in termination of the contract and redirection of funds to more responsive researchers.

Agencies also can negotiate with contract researchers as needs change. Even when delivered to a research institution via contract, earmarked funds are provided regardless of performance, because the award originated from a powerful politician, not from a scientific or technical decision.

◆ **Earmarking causes disadvantages for other transportation research stakeholders.** Universities and other research institutions that do not receive earmarks are cut out of the research program as the competitive funds dwindle. This increases the pressure for these institutions to seek earmarks.

Other stakeholders, such as users and providers of transportation facilities and services, as well as those in associated trades and industries, also are affected by earmarking. For example, during TEA-21, earmarks and other designations left FHWA without resources to continue implementation support for the Strategic Highway Research Program (SHRP). Yet many states were implementing the SHRP results, and coordination and support of these efforts was critical.

State DOTs therefore agreed to dedicate funds from the National Cooperative Highway Research Program (NCHRP) to make up for the federal shortfall. Over 4 years, NCHRP spent \$26 million on SHRP activities—funds that would have been used to solve collective state technical problems not addressed in FHWA research.

As the impacts of earmarking in FHWA's program became more apparent, a range of stakeholders discovered that the agency was no longer able to fund research in areas as diverse as pavements and travel demand modeling, which are critical for the national transportation system.

◆ **Earmarking may undermine respect for science and jeopardize academic freedom.** In allowing the bypass of peer review through earmarking, universities jeopardize the privileged place that science in general and that universities in particular have earned in American society through the delivery of

outstanding scientific and technical research products. For example, the government's support for the system of peer review allows the scientific community to influence the content of federal research programs and the allocation of research funds—a privilege unheard of in other federally funded activities and rare in other countries.

The collective benefits earned through research are taken for granted when individuals succumb to the temptation for a “free ride” on the system via earmarking (3). Earmarking may undermine respect for science and jeopardize academic freedom by reducing researchers to a special interest group expected to deliver votes and politically useful research results.

## Critical Needs

For decades U.S. research has delivered outstanding scientific and technical results that have improved the quality of life. A hallmark of this enterprise has been competition under the review of scientific and technical experts. The erosion of this time-tested process, as individual research institutions seek their own benefits through earmarking, threatens to undermine the promise of collective benefits of research to society.

Support for federal funding of transportation research depends on its effectiveness, which requires strategically focused programs carried out by highly qualified, independent researchers. With critical needs in safety, security, congestion relief, and infrastructure renewal, transportation cannot afford to be served by anything but the highest-quality research.

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