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Report to the Chairman, Subcommittee on Transportation and Related Agencies, Committee on Appropriations, House of Representatives

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DEPARTMENT OF TRANSPORTATION

University Research Activities Need Greater Oversight

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Resources, Community, and
Economic Development Division

B-256867

May 13, 1994

The Honorable Bob Carr
Chairman, Subcommittee on
Transportation and Related Agencies
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

Over the past several years, the Department of Transportation (DOT) has increasingly relied on universities to assist it in meeting the Department's research activities. Concerned about DOT's management and oversight of university activities, you asked that we (1) identify all awards made by DOT and its operating administrations to universities for fiscal years 1991 through 1993, including a description of the overhead charged and a list of all university awards for which the Congress earmarked DOT funds; (2) determine how DOT and its operating administrations plan and track university research activities; and (3) assess how DOT oversees the financial aspects of university research awards.[1]

Results in Brief

DOT was unable to provide complete or accurate information on all awards, including details on the various costs that were reimbursed. Consequently, we developed a questionnaire, which we sent to 206 universities to obtain detailed information on awards and costs. In response to the questionnaire, 141 universities reported receiving, during fiscal years 1991 through 1993, $190 million in new awards directly from DOT (not including awards continued from previous years or awards for which DOT funds were passed through another entity). Sixty-three percent of the reported awards included overhead costs. For these awards, 20 percent of the total funds were spent on overhead. During the same period, the Congress earmarked $178 million in DOT funds to 46 universities or university-related facilities; DOT had obligated approximately $110 million as of September 30, 1993.

DOT's planning for university research activities is diverse and fragmented and is not pursued through an integrated plan. In addition, while DOT has several systems to track spending on its awards, none of them provides complete and accurate information on the total number or purpose of university awards. DOT's investment in university activities has increased

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[1]The term universities includes colleges and other institutions of higher education.

by approximately 470 percent in recent years. An integrated plan for and comprehensive information on DOT's ongoing research can provide the Department with assurance that its increased investment adequately addresses technologies on important cross-cutting and national issues an that unnecessary and duplicative research is not being undertaken. At the urging of the President's National Performance Review, DOT started developing, in late 1993, an integrated national transportation research an development plan to provide direction to its research activities. DOT also i considering developing a centralized data base to track its university research projects, but it has not yet reached key decisions about the scope, implementation, and operation of the data base.

DOT and its operating administrations have provided limited financial oversight of awards to universities; this limitation has resulted in inadequate management control of the award process. We and the DOT Inspector General identified several cases in which DOT allowed overcharges or questionable costs that could total about $450,000. In addition, while cost-sharing is important in leveraging the federal researc investment and in selecting award recipients, we found that the lack of adequate oversight has also resulted in grantees' noncompliance with cost-sharing arrangements totaling almost $3 million.

Background

DOT conducts a variety of research to enhance safety, mobility, environmental quality, efficiency, and economic growth in the nation's transportation system. The results of DOT's research programs include prototypes of systems, new operating procedures, data used to focus policy decisions, and regulations. Within DOT, several offices are responsible for the oversight of research and development (R&D) activitie For example, the Office of Acquisition and Grant Management is responsible for developing departmental management policies for contracts and grants and for overseeing award activities.

DOT does not have a Department-wide university research program. Instead, each of DOT's eight operating administrations incorporates university-based research into its research program. In addition, four of these operating administrations—the Federal Aviation Administration (FAA), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the Maritime Administration (MARAD)[2]—have

[2]The other four operating administrations are the Federal Railroad Administration, National Highwa Traffic Safety Administration, Research and Special Programs Administration, and U.S. Coast Guard. We did not include the St. Lawrence Seaway Development Corporation in our review because it did not report any university-based research in fiscal years 1991 through 1993.

specific university research programs and/or operate university-based Centers of Excellence representing a multiyear commitment to research related to the operating administrations' respective modes of transportation. Also, the Research and Special Programs Administration (RSPA) oversees DOT's University Transportation Centers (UTC) Program to conduct research, educational, and technology transfer programs for regional and national transportation issues.[3] Currently, the program comprises 13 centers involving over 60 universities nationwide; each center receives up to $1 million annually from DOT.

Each operating administration is also responsible for reviewing and monitoring its own university awards to ensure that the awards' objectives are met and the costs are appropriate. Two kinds of costs are involved. One kind is direct costs, such as the salaries of individuals working on a specific project. The other kind is indirect costs, also known as overhead, which are costs that cannot be identified with a specific project. They include depreciation, lighting, and cleaning expenses incurred for common activities. (See app. I for details on direct and indirect costs.)

DOT's Awards to Universities

To obtain information on the amounts and purposes of DOT's awards to universities, we sent a questionnaire to 206 universities. Of the 187 universities responding to the questionnaire, 141 reported receiving 680 direct awards from DOT in fiscal years 1991 through 1993. These new awards, ranging in size from $1,000 to nearly $30 million, totaled $190 million. The recipients reported that the primary purpose of most of these awards was research, while some awards supported educational activities (for example, training and/or fellowships) or facility construction. Sixty-three percent of these awards included indirect costs, which accounted for 20 percent of the total spent for these awards. The indirect cost rates for these awards ranged from 6 percent to 130.5 percent, resulting in a median indirect cost rate of 49 percent. (See app. II for detailed information on the number of awards made by DOT and the types of costs charged. Also, app. II contains a copy of our questionnaire.)

During the same period, the Congress earmarked $178 million in DOT funds to 46 universities and related facilities through directions in committee reports or statutory language. As of September 30, 1993, DOT had obligated

[3]The UTC Program was authorized in the Surface Transportation and Uniform Relocation Assistance Act of 1987 (P.L. 100-17), which provided for the establishment of one center in each of the 10 federal regions. The Intermodal Surface Transportation Efficiency Act of 1991 (P.L. 102-240) reauthorized and expanded the program by creating three new centers.

about $110 million of the total for a variety of purposes, including facility construction, specific research projects, and the establishment of new research centers. Some of these earmarked projects were not captured in our survey of the universities because they were awarded through other entities, such as state departments of transportation. Others were made t facilities that are related to, but independent of, universities, such as university hospitals. (See app. III for information on each congressionally earmarked project.)

DOT Does Not Adequately Plan or Track Its University-Based Research

In fiscal years 1988 through 1993, DOT reported that its funding for university activities increased from $16.3 million to $92.9 million—approximately 470 percent. Also, during the same period, DOT established 13 UTCs and 16 Centers of Excellence throughout the United States. However, for two reasons, DOT cannot be assured either th its increased investment will contribute to advancing technology or that unnecessary and duplicative research is not being done. First, DOT's university-based research activities are not pursued through an integrate R&D plan that would organize and guide research within the Department. Second, no single source of information identifies the Department's university research portfolio.

DOT Does Not Have an Integrated Research Plan

DOT's university-based research efforts are not pursued through an integrated plan. Such a plan would organize and focus the Department's numerous R&D programs. Because DOT lacks such a plan, we found that tl operating administrations' approaches to R&D planning are inconsistent; cross-modal research, which has application to more than one mode, is not being adequately planned; and major university-based research projects do not contribute to the operating administrations' planned R&D activities.

Each of DOT's eight operating administrations is responsible for planning its own R&D activities, which focus on the administration's specific moda responsibility. For example, FHWA's research efforts focus on highway-related issues, such as improving pavement materials for highways, and FAA's research efforts focus on aviation-related issues, suc as improving air traffic control technology. However, the extent of R&D planning efforts among the operating administrations differs significantl For example, the Coast Guard and MARAD do not have R&D plans. While fi other operating administrations have plans, the scope of these plans varies. For example, a Federal Railroad Administration (FRA) official told

us that while FRA has individual project plans, it does not have an up-to-date modal R&D plan. We found that FHWA's R&D plan identifies its R&D goals and priorities, whereas FAA's, FTA's, and the National Highway Traffic Safety Administration's (NHTSA) plans do not identify priorities. Additionally, while RSPA oversees DOT's UTC Program—the Department's largest university research program—each center plans its own research activities as it deems necessary, and as approved by RSPA.

With this diversity of planning efforts, DOT cannot ensure that increasingly important cross-modal issues are adequately addressed. In recent years, DOT has initiated projects at universities in research areas that affect more than one mode of transportation. For example, we identified 14 universities that received awards from FHWA, FTA, NHTSA, and RSPA and that are doing, or have recently completed, research involving intelligent vehicle highway systems (IVHS).[4] Typically, each of these universities is doing IVHS research projects relating to a specific mode of transportation. As a result, no unified approach or direction is applied to issues that involve cross-modal technology.

In addition, because UTCs plan their own research, the research undertaken by these centers does not necessarily contribute to the research goals of the operating administrations. The legislation establishing the UTC Program prescribed that the centers should make contributions to solving regional and national transportation problems. Since their establishment, the centers have performed a mix of regional and national research. For example, the California UTC, located at the University of California at Berkeley, has conducted research on high-speed ground transportation for California and on road damage from trucks. According to the operating administration officials responsible for working with the program, while some UTC projects have national applications, they have not contributed to research needs as defined by their administrations' R&D programs. For example, the official who provides liaison between FHWA and the UTCs stated that even though FHWA has an R&D program that identifies national research needs for highways, he could not identify any UTC project that would be considered nationally significant.

[4]DOT's IVHS Program is expected to provide technologies that, when applied, will result in reductions in traffic congestion, a safer traveling environment, increases in the usefulness and attractiveness of public transportation, savings in energy usage and travel time, and improvements in personal productivity. In fiscal years 1993 through 1995, DOT plans to spend a total of more than $295 million on IVHS R&D.

Because its university-based research has grown significantly and its research efforts are fragmented within the Department, DOT needs to develop an integrated R&D plan. A similar need was previously identified by the Congress in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA).[5] Because the Congress found that R&D programs related to surface transportation were fragmented and that DOT lacked integrated R&D planning for surface transportation, it directed the Secretary of Transportation to develop an integrated national R&D plan for surface transportation, which was published in July 1993. Similarly, in September 1993, the President's National Performance Review recommended that DOT examine the nation's transportation-related R&D portfolio and develop an integrated national transportation plan that considers specific transportation research needs for all modes as well as intermodal transportation plans.[6] To address this recommendation, DOT is developing an integrated R&D plan that identifies modal and intermodal research needs. As of the last quarterly report on the recommendations in the National Performance Review, dated February 1994, the Director of Technology Deployment, who is directing this effort, estimated that the plan will be completed in the fall of 1994.

DOT Lacks Comprehensive Information on University Awards

While the National Performance Review recommended that DOT examine its research portfolio in developing an integrated plan, DOT does not have a comprehensive picture of that portfolio because it does not have a central source of information on all of its research awards to universities. Although it uses several systems to track spending on university awards, the systems do not, individually or collectively, provide DOT with complete and accurate information on the total number of awards made to universities or the purposes of the awards. Without such information, DOT is unable to perform key management functions to coordinate research across operating administrations and to prevent unintended duplication.

DOT maintains some information on its awards to universities at several levels, but each information system is incomplete or inaccurate in some way:

[5]ISTEA's stated purpose is "to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in a global economy, and will move people and goods in an energy efficient manner."

[6]From Red Tape to Results: Creating a Government That Works Better and Costs Less, National Performance Review (Washington, D.C.: Government Printing Office, Sept. 7, 1993).

- The primary source of information on the amount of funds that DOT has awarded to universities is its input into the National Science Foundation's (NSF) annual survey of all federal funds awarded to universities.[7] However, this survey captures only the total amount awarded to each institution and therefore does not reflect the number of awards or the purpose of individual awards. Also, we found inaccuracies in DOT's data provided to NSF. For example, 31 universities not included in these data reported to us that they had received a total of $21.5 million in funding from DOT agencies, such as MARAD and FAA, in fiscal years 1991, 1992, and 1993.
- DOT's Office of Acquisition and Grant Management maintains systems designed to provide information on all of DOT's awards. However, we found that many of the universities identified as having received DOT funds in NSF's survey were not reflected in this data system. Officials in the Office who are responsible for the systems told us that the Office does not require that contracts for less than $25,000 be entered into the system and that some grants are not entered into the system because they are small in comparison to other DOT grants. Also, the system was not designed to maintain information on the actual costs incurred under these awards.
- Each of DOT's operating administrations has an information system to track its university awards. However, several operating administrations were unable to provide us with a complete list of university research projects because their information was spread among several different systems. For example, FAA provided us with a list of its university research projects; however, we later identified nine additional universities, either through discussions with agency officials or reviews of the agency's documents, that were not on the list originally provided to us. Only MARAD was able to provide the detailed information on project costs that we requested.

Because of the increase in research in the areas that affect more than one mode of transportation, the need to coordinate related projects has also grown. Some DOT and university officials told us that they attempt to coordinate and prevent the duplication of research projects through the use of an information system operated by the Transportation Research Board of the National Research Council—the Transportation Research Information Services (TRIS). Although TRIS is supposed to identify all ongoing and completed transportation research, entering information is voluntary, and the system has only recently begun to gather information on ongoing projects. As a result, its usefulness in coordinating ongoing research projects has been limited.

[7]Each year, NSF compiles its data by asking each federal agency to identify the amount of funds it has awarded to each college and university in the United States. Within DOT, the responses from all of its operating administrations are combined to yield DOT's total support to universities for that year.

Recognizing the need for more detailed information on DOT's university research projects, the Assistant Secretary for Budget and Programs conducted a review of university research and gathered data with the intent of establishing a data base to track each university project funded by DOT. This data base is expected to include detailed information about each award. As of April 1994, DOT had not yet reached a decision on the scope of the system, set a date for its implementation, or determined where in DOT the system would be maintained.

DOT Does Not Exercise Adequate Financial Oversight of University Awards

The Office of Management and Budget's (OMB) Circular A-21 establishes principles for determining the costs of research activities at educational institutions. However, DOT and its operating administrations do not effectively monitor awards. On the basis of the 50 awards we reviewed, w identified several cases in which DOT allowed overcharges or questionable indirect and direct costs that could total about $100,000. We also found noncompliance with cost-sharing arrangements totaling almost $3 million In addition, DOT's Inspector General recently identified questionable direc charges to another university project totaling $350,000.[8]

Verification of Costs Is Inadequate

For its awards, DOT and its operating administrations are responsible for ensuring that universities correctly apply the appropriate indirect cost rates and allowable direct costs. These indirect cost rates are negotiated primarily by the Department of Health and Human Services (DHHS) or the Department of Defense's Office of Naval Research (ONR). (See app. I.)

At the departmental level, DOT's Office of Acquisition and Grant Management is responsible for evaluating acquisition and grant management activities to determine whether proper practices are being used and to improve performance in this area. However, an official in the Office told us that it had not conducted grant management evaluations in over 3 years. As a result, DOT cannot be assured that the operating administrations are complying with federal guidelines on awards to universities.

In addition, we found that (1) the operating administrations do not alway verify that correct rates are applied and (2) the university award files maintained by the operating administrations do not always contain the approved indirect cost rate agreements with DHHS or ONR. For example, w

[8]Report on the Audit of Testing New Bus Models, Federal Transit Administration, Rpt. No. R3-FT-4-0 (Feb. 28, 1994).

found one FTA award for which a university applied the indirect cost rate to tuition payments made to a student, even though the rate agreement precluded this charge. An FTA grant management official stated that no procedures exist that require verification of the items to which the rates should be applied. Because verification did not occur, FTA allowed an overcharge of about $3,000.[9]

In another example, we found that FHWA had accepted an on-campus indirect cost rate for one university research project even though most of the research was being conducted off-campus at FHWA's own research facilities. FHWA did not have a copy of the approved rate agreement and failed to verify the indirect cost rate; the result was overcharges that could exceed $60,000.[10] FHWA contracting officials agreed that they should have the approved rate agreements to verify the rates being applied. However, they stated that they have no procedures on how to use the rate agreements. A DHHS official also commented that rate agreements are made available to agencies upon request. However, he said that DOT had never requested them from DHHS.

Some of DOT's operating administrations have also allowed questionable direct costs in awards to universities. For example, we found that FRA allowed direct costs, totaling about $14,000 among four contracts awarded to one university in fiscal year 1991, for administrative charges for salaries and supplies that can be included in indirect costs. FRA questioned the manner in which these costs were determined and asked the Defense Contract Audit Agency (DCAA) whether they were allowable. DCAA replied that it had not audited these costs. Because the university had charged these costs in other awards, FRA did not question them any further.[11]

FTA also allowed questionable costs of $373,000 involving two awards. For one award, FTA allowed direct costs of about $23,000 for computer and video equipment, even though OMB guidelines require universities to get

[9]We referred the matter to DHHS, which concluded that the university did not comply. As of April 1994, it was seeking to recover overcharges to all federal awards made to the university during the 9-year period of noncompliance.

[10]This case involves an ongoing research project, and the sum represents the total potential overcharge through the completion of the project. We referred this matter to FHWA, which agreed to take corrective action to adjust the contract and recover the overcharges.

[11]At the request of ONR in August 1993, DCAA audited the university's administrative costs. It reported in February 1994 that this method was not in compliance with cost principles contained in OMB Circular A-21 because similar costs were being recovered as both direct and indirect costs. Such a practice could result in excessive costs, and DCAA recommended that the university discontinue charging similar costs both as direct and indirect costs. While the university agreed with DCAA's findings, corrective actions have not yet been planned.

approval from the grantor agency before purchasing equipment. The FTA grant manager for this award said that he was unaware of OMB's requirement governing the approval of equipment purchases and did not place such a requirement on the grantee. The grant manager told us that he would notify the grantee of the requirement and review the purchases to determine whether they should be charged to the grant. For the other award, DOT's Inspector General reported in 1994 that FTA was overcharged $350,000 in questionable personnel and equipment costs by one university because FTA allowed the principal investigator at the university wide latitude in assigning personnel and procuring items associated with the project. Such costs included payments to personnel no longer associated with the project and purchases of equipment not related to the project. At the end of our review, an FTA official informed us that FTA had disallowed the questionable expenses and would offset these costs against future payments to the university.

Compliance With Cost-Sharing Arrangements Not Enforced

Universities reported that 122 (17.9 percent) of the 680 DOT awards made during the period of our review required cost-sharing. Cost-sharing represents financing by a mix of federal and nonfederal funds. It can consist of cash contributions to the research project or in-kind contributions, such as reduced salaries for researchers or lower indirect costs than allowed. From a budgetary standpoint, cost-sharing is important to DOT's research efforts to ensure that the Department's investment is leveraged, whenever possible, by nonfederal funds. Cost-sharing is also important because it can be the deciding factor in making an award.

Despite the importance of cost-sharing, DOT's operating administrations have not exercised adequate oversight to ensure compliance with the cost-sharing requirements. For example, the legislation establishing the UTC Program requires cost-sharing, and grantees must provide a dollar-for-dollar nonfederal matching share for each award. However, we found that, as of December 31, 1993, three of the centers had failed to meet their required share by almost $3 million. According to RSPA officials, the enabling legislation did not stipulate when the centers had to provide their nonfederal shares. As a result, RSPA did not have any uniform practice for enforcing the requirement. During our review, RSPA developed procedures reinforcing its responsibility to ensure that, as a condition of continuing the grant, the required nonfederal share must be provided annually.

Conclusions

DOT needs to better plan and track its university research activities, which are spread throughout its operating administrations, to ensure that its investment is focused on its research needs. As the result of a recommendation by the National Performance Review, DOT is already in the process of developing an integrated departmental R&D plan. While we believe such a plan could provide an overall focus for DOT's research program, we would also look for the plan to specifically address how DOT's growing university-specific programs fit into the Department's overall research program.

Additionally, by establishing a comprehensive information system for its awards to universities, DOT could better ensure that it does not fund overlapping or duplicative research. Such a system would also allow DOT to make basic management decisions about its research, such as whether the establishment of long-term commitments to universities is appropriate, considering the level of university involvement in existing research programs. The need for such a system is increasingly important because of the exponential growth in funding to universities and the continued fragmentation of university-based research within DOT. While DOT is considering implementing a data base to track this information, the Department has not established any firm plans for its implementation.

Also, the Department needs to better ensure that its growing investment in university research is not wasted on improper charges and is leveraged by nonfederal matching funds when required by law. First, the Office of Acquisition and Grant Management needs to fulfill its responsibility for ensuring that the operating administrations are complying with program requirements. Additionally, the operating administrations need to strengthen their financial monitoring of university awards to better detect unallowable and improper costs and to ensure that the required matching funds are provided.

Recommendations

In order to ensure that DOT gets the most benefit from its increasing investment in university research, we recommend that the Secretary of Transportation

- direct the Office of the Assistant Secretary for Budget and Programs to complete the development of a Department-wide data base to track the purpose and costs associated with each university research award and determine how best to maintain and operate the data base and

- direct the Office of Acquisition and Grant Management to reinstitute its evaluation process and ensure that the operating administrations have adequate policies and procedures for managers to carry out their responsibilities for monitoring awards, especially in the area of indirect costs.

Agency Comments

As requested, we did not obtain written agency comments on a draft of this report. However, we discussed the facts, conclusions, and recommendations in this report with officials from the Office of the Secretary of Transportation, including the Chief, Grants Management Division, Office of Acquisition and Grant Management, and the Director and Deputy Director, Office of Budget. We also discussed the material in this report with research program and contract and grant administration officials from FAA, FHWA, FRA, FTA, MARAD, NHTSA, and RSPA. These officials provided several suggestions for clarifying the facts presented, and we incorporated their comments where appropriate. For example, as a result of FRA's comments, we clarified information on the status of the agency's R&D plans. In another instance, at the request of the Chief of the Grants Management Division, we provided more details in the report on why certain costs were questionable.

Concerning our conclusion and recommendation calling for a Department-wide system for tracking university research, the Chief of the Grants Management Division said that the intrinsic value of such a system was not clear. However, the Deputy Director of the Office of Budget stated that while this Office is currently studying the design of a data base for university awards, it has not decided where such a data base should be maintained. We reemphasized in our conclusions section why we believe such a system is needed, including the need for information to prevent unintended duplication and the dramatic growth in university awards. Additionally, the government-wide problems our previous work identified were caused by lax oversight of university costs, and in our view, justify the need for more information on university awards.[12] We also amended our recommendation to allow DOT to determine which office should maintain the data base currently under development. The Director of the Office of Budget subsequently agreed with the recommendation as amended.

[12]Federally Sponsored Research: Indirect Costs Charged by Stanford University (GAO/T-RCED-91-18, Mar. 13, 1991) and Federally Sponsored Research: Indirect Costs Charged by Selected Universities (GAO/T-RCED-92-20, Jan. 29, 1992).

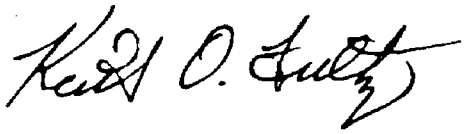
The Chief of the Grants Management Division disagreed with our conclusion and recommendation that improved procedures are needed to ensure proper oversight of university research awards. He stated that the problem could be solved by better training and increased supervision. While we agree that training and supervision may also be necessary, we believe that adequate procedures are equally if not more important because they can provide guidance to grant and contract managers when training and supervision are not adequate. We amended our recommendation by directing the Office of Acquisition and Grant Management to reinstitute its evaluation process on the performance of the operating administrations to ensure that adequate policies and procedures are available for officials to carry out their oversight responsibilities.

Our review was conducted between June 1993 and April 1994, in accordance with generally accepted government auditing standards. Appendix IV contains details on our scope and methodology.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 5 days from the date of this letter. At that time, we will send copies to the Secretary of Transportation; the Administrators of DOT's operating administrations; and the Director, Office of Management and Budget. We will also make copies available to others on request.

This work was performed under the direction of Kenneth M. Mead, Director of Transportation Issues, who can be reached at (202) 512-2834. Other major contributors to this report are listed in appendix V.

Sincerely yours,



Keith O. Fultz
Assistant Comptroller General

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Abbreviations

DCAA	Defense Contract Audit Agency
DHHS	Department of Health and Human Services
DOD	Department of Defense
DOT	Department of Transportation
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GAO	General Accounting Office
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
IVHS	intelligent vehicle highway systems
MARAD	Maritime Administration
MTDC	modified total direct cost
NHTSA	National Highway Traffic Safety Administration
NSF	National Science Foundation
OMB	Office of Management and Budget
ONR	Office of Naval Research
R&D	research and development
RSPA	Research and Special Programs Administration
TRIS	Transportation Research Information Services
USCG	United States Coast Guard
UTC	University Transportation Centers

Description of Direct and Indirect Costs

Office of Management and Budget (OMB) Circular A-21 establishes the principles for determining costs applicable to grants, contracts, and other agreements with educational institutions. Federal agencies, such as the Department of Transportation (DOT), are to apply Circular A-21's cost principles in allowing direct costs. Direct research costs can include such items as the salaries and fringe benefits of the investigators and other staff who performed work on the project and project-specific research equipment and material. To apply these principles, Circular A-21 states that direct costs are only those costs that can be identified specifically with a particular research project or can be directly assigned to such project with relative ease and a high degree of accuracy. Also, in connection with equipment, Circular A-21 requires previous approval on the part of the agency and states that equipment costs are unallowable as direct charges unless approved in advance.[1]

In addition to defining direct costs, Circular A-21 identifies unallowable costs, such as entertainment, alcohol, and the personal living expenses of university officers. Circular A-21 also identifies indirect costs that are associated with the direct costs. The indirect costs are those costs that are not specifically identified with a particular project, and Circular A-21 establishes indirect cost categories that schools should establish for accumulating and allocating such costs to research projects. The indirect costs are classified within two broad categories: Facilities and Administration. Within each broad category, the costs are accumulated into indirect cost pools representing similar expenses. Table I.1 shows within each of the broad categories examples of indirect cost pools and types of indirect costs accumulated.

[1]OMB Circular A-21 identifies equipment as general or special purpose. General purpose equipment is property that can be used for more than research. Examples are data processing, reproduction, and office equipment. Special purpose equipment is defined by Circular A-21 as equipment that is only use for research or other technical activities. Circular A-21 requires previous approval for general purpose equipment exceeding an acquisition cost of $500 and for special purpose equipment exceeding a unit cost of $1,000.

Table I.1: Indirect Cost Categories and Examples of Costs Accumulated

Cost category	Indirect cost pool	Indirect cost types
Facilities		
	Depreciation and use allowance	Depreciation expenses associated with the use of buildings, equipment, and improvements
	Operations and maintenance expenses	Janitorial and utility expenses and repairs of furniture and equipment
	Library expenses	Operating expenses, including purchases of books and materials
	Interest	Interest on debts associated with certain buildings and equipment
Administration		
	General administration and general expenses	Expenses associated with central offices such as salaries and expenses of the (1) President's office and (2) budget, accounting, planning, and legal offices
	Departmental administration	Expenses associated with the administrative functions of academic departments, including salaries and expenses of department heads, and clerical staff
	Sponsored projects administration	Salaries and other expenses associated with administering awards of federal and nonfederal sponsors, including expenses for contracting and publishing reports
	Student administration and services	Expenses associated with student affairs such as salaries and other expenses for admissions, placement, and counseling

Once indirect costs are accumulated in these indirect cost pools, they are then allocated to "organized" research and other activities, such as instruction and other institutional activities, that represent the major functions of the university.[2] The bases for allocating each pool of indirect costs to each major activity vary. Most often the allocation base used is assignment of space for the facilities category or a modified total cost base for the administration category; but universities can use other procedures if they can justify that they are fair and reasonable.

After all indirect costs have been allocated to each major function, the costs allocated to "organized" research from each pool are totaled and used to determine the indirect rate. The indirect rate is determined by dividing the indirect costs from each pool by the modified total direct cost

[2]"Organized" research is the function that includes research and development activities sponsored by federal and nonfederal agencies and organizations.

base (MTDC) for "organized" research. Circular A-21 defines MTDC to include salaries and wages, fringe benefits, materials and supplies, services, travel, and the amount of any subgrants and subcontracts up to $25,000 each. The result is an indirect rate for each pool, the sum total of which is the overall indirect cost rate applicable to "organized" research.

The actual reimbursement rate, however, is subject to negotiation between the university and primarily the Department of Health and Human Services (DHHS) or the Department of Defense's (DOD's) Office of Naval Research (ONR) and any statutory or administrative limitation placed on the amounts that can be recovered. For example, OMB Circular A-21 imposes an administrative 26-percent cap on negotiated rates for all indirect costs for expenses under the "Administration" category. In connection with rate negotiations, OMB Circular A-88, which provides for a coordinated federal approach to establishing indirect cost rates, assigns each college and university to a cognizant federal agency. The majority of the universities that reported receiving funds from DOT responded that either DHHS (80 percent) or ONR (12 percent) was their cognizant agency.[3] Once an indirect cost rate has been negotiated by DHHS or ONR with universities, other government agencies, such as DOT, that fund grants, contracts, and other agreements must accept the rates contained in the rate agreements unless specific statutory or administrative limitations apply to a given award.

The indirect cost rate agreements generally cover several years, and indirect cost rates can vary (increase or decrease) during the period. Also, the agreements can contain a range of negotiated indirect cost rates that are applicable to (1) a specific location, such as on-campus versus off-campus activities, or activities of a particular laboratory doing research at a university and (2) major functions, such as "organized" research and/or instruction.

Generally, the on-campus rates are higher than the off-campus rates because higher costs are associated with maintaining on-campus facilities. In addition to listing the negotiated rates, the agreements identify the base that universities must use in applying the indirect rate to seek agency reimbursement. The universities should apply the appropriate indirect cost rate against the direct cost base stipulated in the rate agreement for such things as salaries and wages, materials, and supplies. Conversely, the universities may not apply any indirect cost rates to the direct costs that

[3]The remaining 8 percent of the universities either did not identify a cognizant agency or listed another agency, such as the Department of Energy, as their cognizant agency.

are excluded from the direct cost base definition included in the negotiated rate agreement. Such exclusions from the direct cost base definition can include capital equipment, the portions of subgrants or subcontracts in excess of $25,000, and student tuition.

Each year, DHHS' Office of the Inspector General and DOD's Defense Contract Audit Agency (DCAA) review selected aspects of costs recovered through the rate agreements to ensure that the costs and allocation methods are appropriate. In addition, the Office of Inspector General in each awarding agency performs other audits, and independent auditors perform single audits.

In single audits, the independent auditor audits the university's financial statements and its federal awards. The audit of federal awards includes both internal controls and compliance testing and requires the independent auditor to give an opinion on compliance for each major program.[4] This opinion covers total costs (both direct and indirect) for each major program and includes compliance with the cost principles of OMB Circular A-21. We have previously reported on problems and actions taken by DCAA, DHHS, and OMB for single audits to improve their timeliness and thoroughness, and/or audit oversight given to university grants' indirect costs.[5]

[4]A program is classified as "major" when total federal expenditures equal or exceed 3 percent of the total federal funds expended, or $100,000, whichever is greater. The sum of the expenditures from all research and development awards received is considered a program.

[5]Federal Research: System for Reimbursing Universities' Indirect Costs Should Be Reevaluated (GAO/RCED-92-203, Aug. 26, 1992) and Grant Management: Improvements Needed in Federal Oversight of NSF Grants (GAO/T-RCED-91-92, Sept. 24, 1991).

DOT's Awards Made to Universities in Fiscal Years 1991 Through 1993

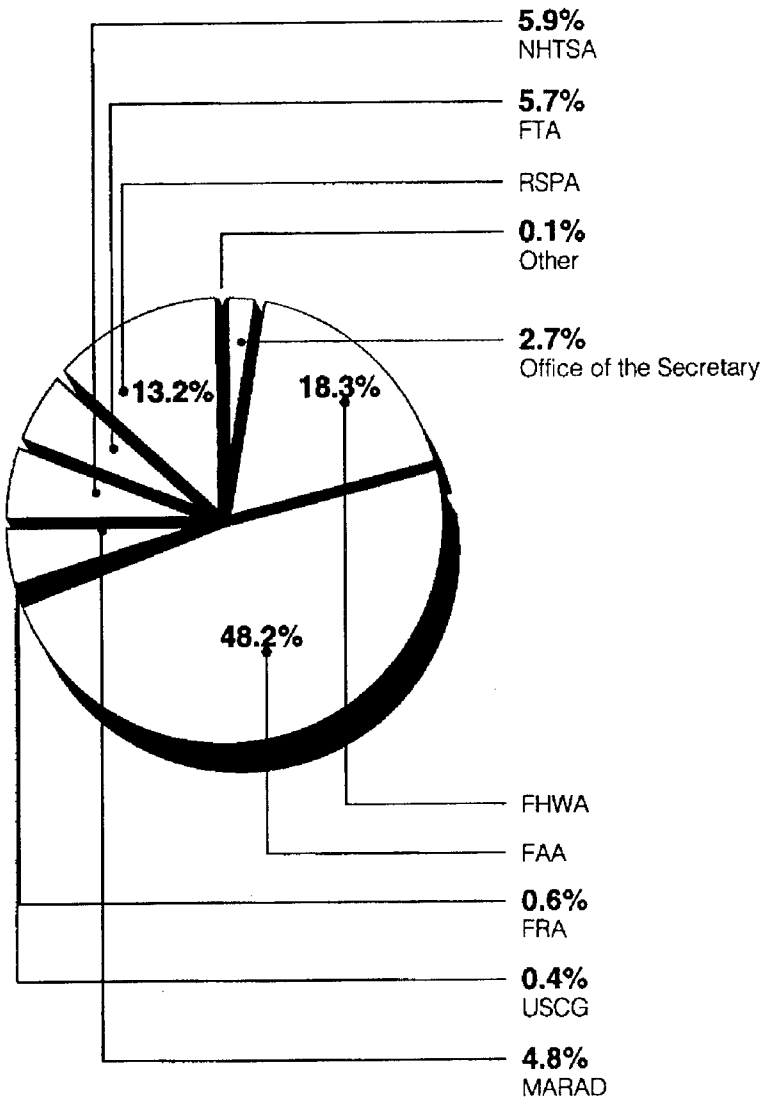
This appendix provides our analysis of the amounts and types of costs associated with DOT's awards to universities in fiscal years 1991 through 1993. It is based on a survey we conducted of 206 institutions, in which we asked for detailed information on each of the direct awards received from DOT. We received valid responses from 187 institutions, of which 141 reported receiving new awards from DOT during the period. We did not ask about funds provided for awards made previous to fiscal year 1991 that continued to receive funding during fiscal years 1991 through 1993, nor about DOT funding that was provided to another entity, such as a state department of transportation, which in turn gave it to a university. (A detailed description of our methodology is provided in app. IV.)

Total Awards

On the basis of the results of our questionnaire (see pages 34-37), the educational institutions reported that DOT made 680 awards to 141 universities in federal fiscal years 1991 through 1993. These awards totaled $190 million: $29 million in fiscal 1991, $57 million in fiscal 1992, and $104 million in fiscal 1993. Institutions with more than 15,000 students received about half of all awards, totaling $115.7 million.

The Federal Highway Administration (FHWA) and the Federal Aviation Administration (FAA) funded the highest number of awards (250 and 180, respectively). In addition, they accounted for the largest amount of funds ($34.8 million and $91.7 million, respectively). The percentage of total funds awarded by each administration for the 3-year period are detailed in figure II.1.

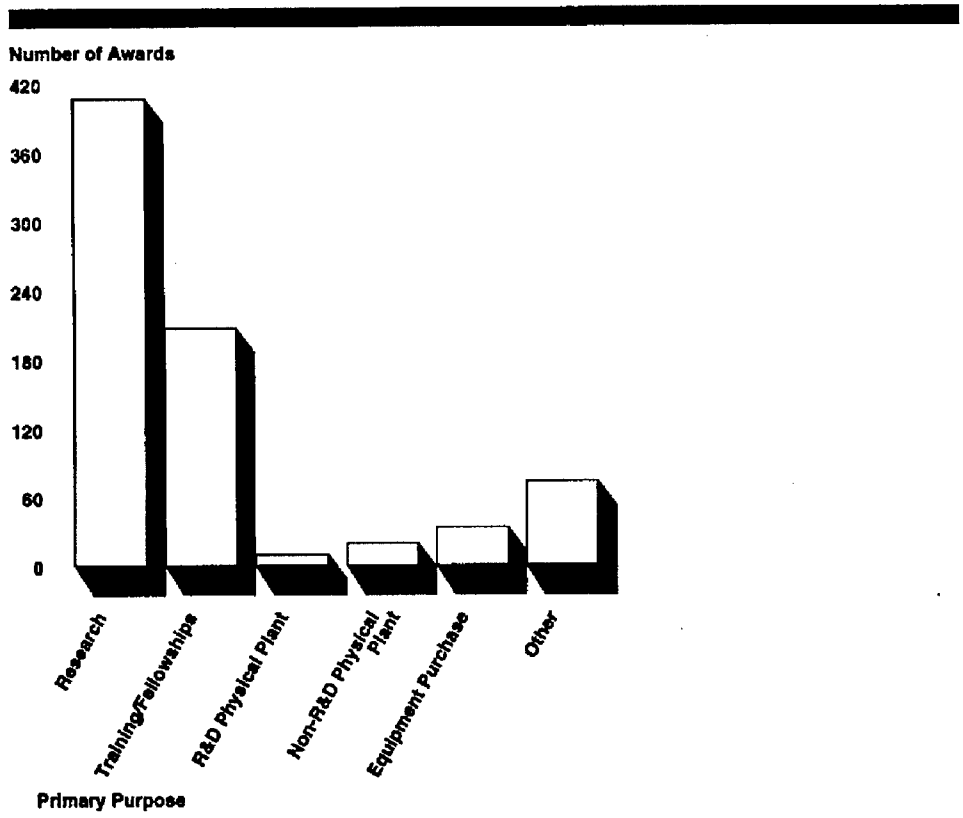
Figure II.1: DOT Funds Awarded to Universities, by Operating Administration, Fiscal Years 1991 Through 1993



Purposes of Awards

For each award, we asked the recipients to identify the primary purpose or purposes of the award. Of the awards reported, 407 reported research as a primary purpose. Training and/or fellowships were identified as a primary purpose on 207 awards. Equipment was identified on 33 awards, construction was identified on 28 awards (including both research and development (R&D) and non-R&D physical plant), and "other purposes" was identified on 74 awards. The purposes of all reported awards are shown in figure II.2. In some cases, the recipient identified more than one purpose as a "primary purpose" of an award. As a result, the total number of primary purposes identified is greater than the total number of awards reported.

Figure II.2: Primary Purposes Identified for University Awards From DOT, Fiscal Years 1991 Through 1993



Indirect Costs

Of the 680 awards reported in response to our questionnaires, 427 included funds for indirect costs, sometimes called overhead (see app. I for a discussion of direct and indirect costs). Of the $78.8 millon expended

for these awards as of September 30, 1993, $15.8 million (20 percent) was spent on indirect costs. The indirect cost rates charged to DOT awards ranged from 6 percent to 130.5 percent of some portion of the direct costs. The median indirect cost rate charged was 49 percent. In general, the lower indirect cost rates were charged for projects not related to research, such as education, while the higher rates were charged for on-campus research or special facilities. Table II.1 depicts the high, low, and median indirect cost rates charged for each type of activity.

Table II.1: Indirect Cost Rates Charged by Universities, by Range and Type of Activity

Type of activity	Highest rate (percent)	Lowest rate (percent)	Median rate (percent)
On-campus research	69.0	9.6	52.0
Off-campus research	32.5	9.8	24.2
On-campus instruction	64.0	20.0	29.5
Off-campus instruction	42.5	10.2	26.0
On-campus (all activities)	69.5	26.0	55.0
Off-campus (all activities)	29.0	23.0	26.0
Research (all locations)	67.0	37.0	45.0
Instruction (all locations)	33.0	30.0	33.0
Other (e.g., special facilities)	130.5	6.0	28.2

Direct Costs

We also asked that award recipients provide information on the types of direct costs that were budgeted (what types of costs they expected to incur) and expended (what types of costs were actually paid) for each award. On the basis of the 680 reported awards, most of the funds budgeted and expended went to pay salaries and related expenses: 31.8 percent of the funds were budgeted for this purpose and 43 percent were expended.[1] Facility construction also made up a significant portion of the funds (19 percent budgeted, 15.4 percent expended), as did subawards (14.4 percent budgeted, 6.7 percent expended). Figures II.3 and II.4 show the percentage of each type of cost budgeted or expended.[2]

[1]We asked each institution to identify the salaries that were paid to faculty, administrative, or other staff. However, since many institutions were unable to identify salaries in this manner, we are providing data only on total salaries and benefits.

[2]An institution may have reported that it had spent more than it budgeted for a particular category of direct costs for several reasons, including that (1) some awards allow the recipient to move funds among categories as long as they do not exceed the total amount of the award and (2) some awards may have received modifications approving the shifting of funds from one category to another.

Figure II.3: Percent of DOT-Awarded Funds Budgeted, by Cost Category

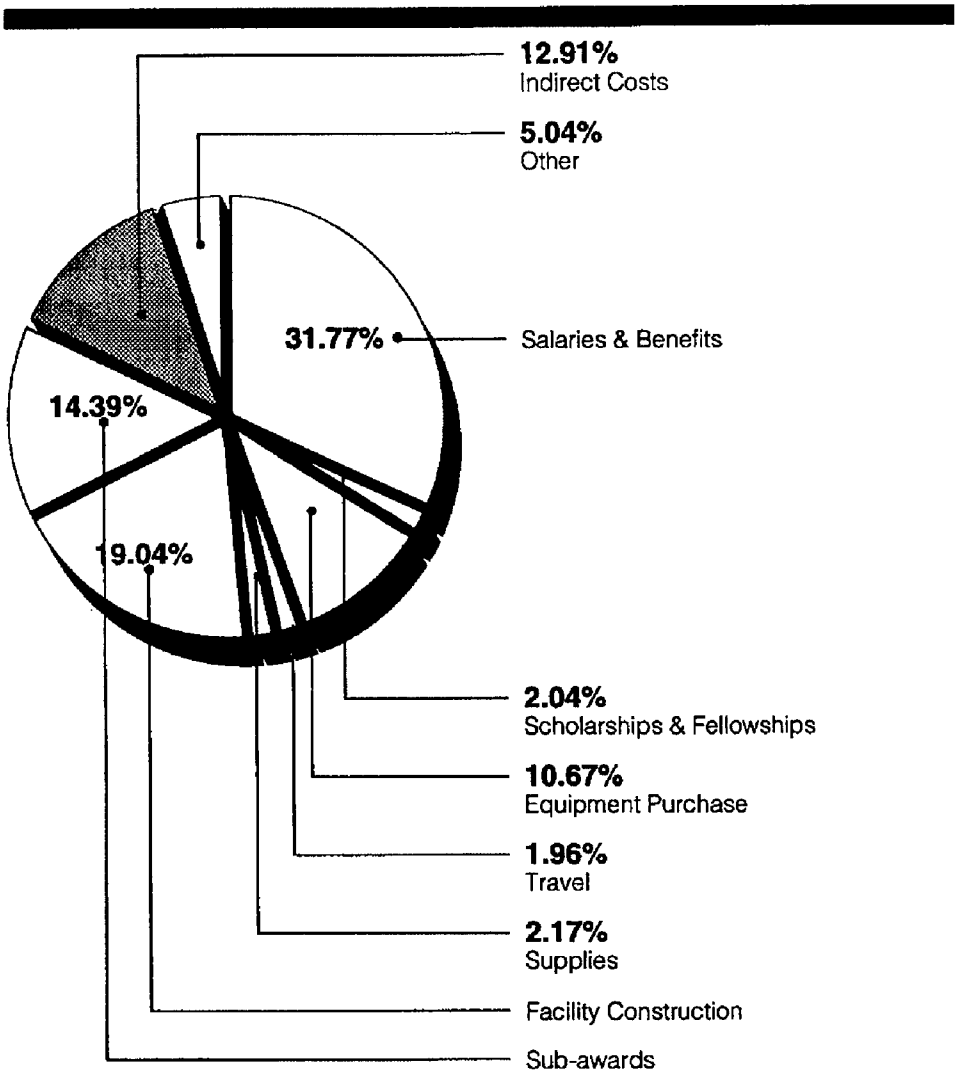
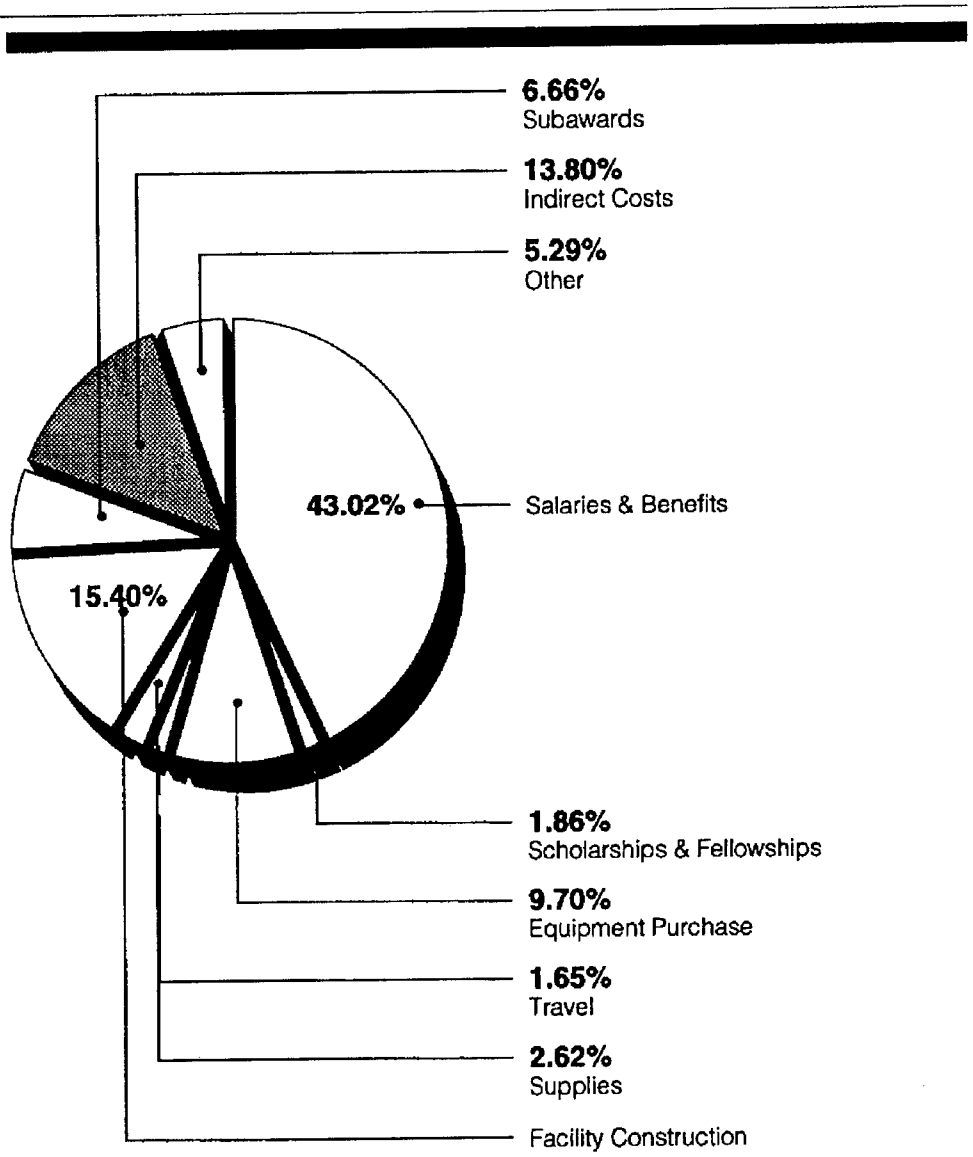


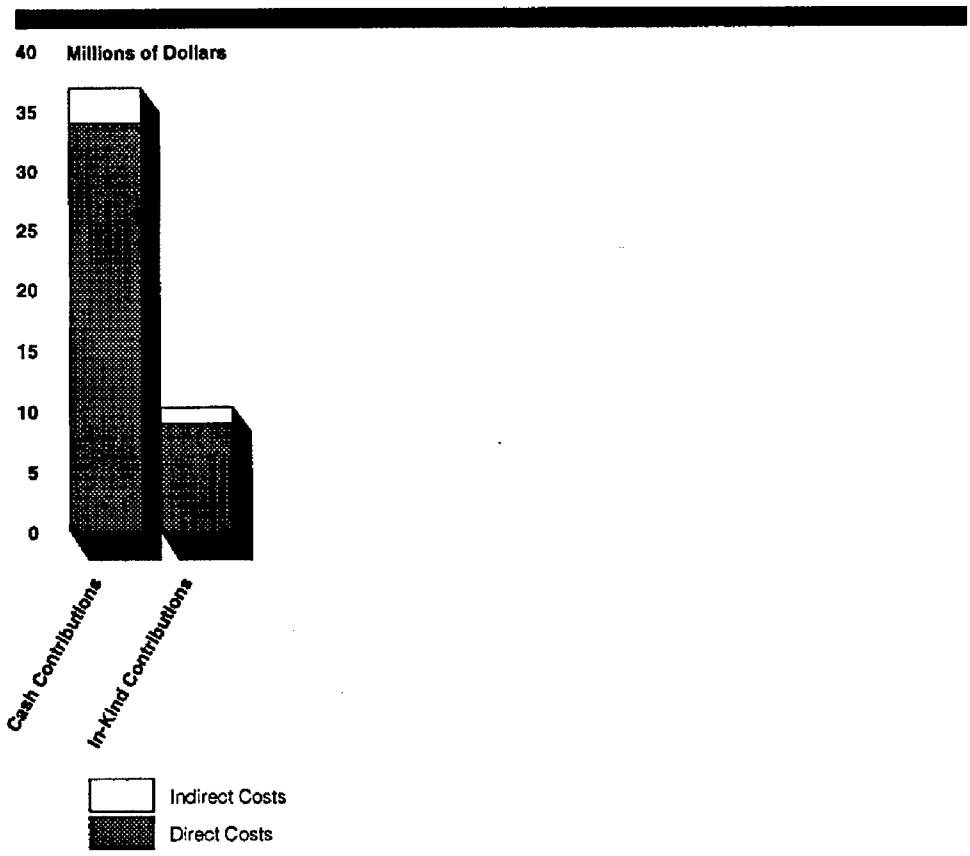
Figure II.4: Percent of DOT-Awarded Funds Expended, by Cost Category



Matching Fund Requirements

We asked that for each award the recipient identify whether it was required to provide any nonfederal funds as a match or cost-share. Of the 680 awards reported to us, 122 (or 17.9 percent) were required to provide matching funds. In total, recipients reported that they provided $46.7 million in required matching funds during the period—an average of 38 cents for every dollar awarded for those awards requiring matching funds. We asked whether the required matching funds were provided through cash or in-kind (for example, donated services) contributions and whether those contributions were made to direct or indirect costs. Most of the matching funds reported were identified as cash contributions to direct costs. Figure II.5 outlines the type and source of required matching funds provided.

Figure II.5: Types of Costs Paid With Nonfederal Matching Funds Through Direct and In-Kind Contributions



Also, 24 percent of the matching funds were provided by parties other than the primary recipient, such as subawardees or state departments of transportation. Finally, recipients reported that in addition to required matching funds, they provided an additional $7.1 million in voluntary matching funds, even if no match was required.

GAO's Survey of DOT's Awards to Educational Institutions

U.S. General Accounting Office

GAO Survey of Awards to Educational Institutions by the U.S. Department of Transportation

The United States General Accounting Office (GAO), an agency that examines issues for Congress, is conducting a review of awards made to educational institutions by the U.S. Department of Transportation (DOT). This review was requested by the Chairman, Subcommittee on Transportation and Related Agencies Appropriations, House Committee on Appropriations.

As a part of our review we are sending a questionnaire to grants and awards officers for all universities that have received awards from DOT. Specifically we are interested in the numbers of awards received, the DOT source agency for each award, and budgeting and accounting information for each award. We realize that the awards officer may not have all this information immediately available. If not, please consult with any parties that would have the information available.

Please respond to this questionnaire within 15 days of receipt, if possible, in the enclosed self-addressed business-reply envelope. If the envelope is missing or has been misplaced, please return the questionnaire to the following address:

U.S. General Accounting Office
Attn: James Sweetman
Room 1826 (NE 1115)
441 G St., N.W.
Washington, DC 20548

If you have any questions please call James Sweetman at (202) 401-6577.

Thank you for your assistance.

Q1. Is this a public or private institution? (Check one)

1. ☐ Public
2. ☐ Private
3. ☐ Other (Please describe)

Q2. What is this institution's total full-time and part-time undergraduate and graduate/professional enrollment for the current academic year? (Enter number for each)

Full-time	Part-time	
_____	_____	Undergraduate
_____	_____	Graduate/ Professional

Q3. Between October 1, 1990 and September 30, 1993, how many awards (including grants, contracts, and cooperative agreements) did this institution receive directly from the U.S. Department of Transportation (DOT)? Do not include awards for which the institution is a sub-awardee. (Enter number)

_____ Number of direct awards

Q4. Which of the following federal agencies is the Cognizant Agency for determining and auditing federal indirect cost rates for this institution? (Check one)

1. ☐ Department of Health and Human Services
2. ☐ Office of Naval Research
3. ☐ Other (Please Specify)

⟹ PLEASE READ ⟸

For EACH of the awards you identified on the preceding page, please answer all questions on the following pages. Answer the complete set of questions for each award ***USING A SEPARATE SET OF PAGES FOR EACH.*** If more pages are needed, make as many copies as necessary.

Q5. What is the DOT agency award number?

Q6. What was the DOT title of the award?

Q7. To the best of your knowledge, was this award provided as a result of congressional direction specifically naming this institution? (Check one)

1. ☐ No
2. ☐ Yes ⟹ What was the statutory citation?

Q8. What was/were the primary purpose(s) of the award? (Check all that apply)

1. ☐ Research
2. ☐ Training/fellowships
3. ☐ R&D physical plant/construction
4. ☐ Non-R&D physical plant/construction
5. ☐ Equipment purchase
6. ☐ Other (Please specify)

Q9. What was the approved start and end date of the award?

___/___/___ Start date

___/___/___ End date

Q10. What was the type of award? (Check one)

1. ☐ Grant
2. ☐ Contract
3. ☐ Cooperative agreement
4. ☐ Other (Please specify)

Q11. What DOT agency was the primary source of award? (Check one)

1. ☐ Office of the Secretary of Transportation
2. ☐ Federal Highway Administration
3. ☐ Federal Aviation Administration
4. ☐ Federal Railroad Administration
5. ☐ U.S. Coast Guard
6. ☐ Maritime Administration
7. ☐ National Highway Traffic Safety Administration
8. ☐ Federal Transit Administration
9. ☐ Research and Special Programs Administration
10. ☐ Other (Please specify)

Q12. What was the total amount of the award? (Enter amount)

$_____

Q13. For this award, please break down the amount awarded to this institution in each of the following time periods. (Enter amount)

$_____ 10/1/90 to 9/30/91

$_____ 10/1/91 to 9/30/92

$_____ 10/1/92 to 9/30/93

Q14. Please break the original budgeted amount of the award and the amount EXPENDED as of September 30, 1993 into the following cost categories. (Enter amount in dollars for each)

	Original approved budget	Expenditures as of Sept. 30, 1993
Faculty salaries	$_____	$_____
Administrative/ secretarial salaries	$_____	$_____
Other salaries	$_____	$_____
Fringe benefits	$_____	$_____
Scholarships/ fellowships	$_____	$_____
Equipment	$_____	$_____
Travel	$_____	$_____
Supplies	$_____	$_____
Facility construction	$_____	$_____
Subawards	$_____	$_____
Indirect Costs	$_____	$_____
Other (Please specify)		
	$_____	$_____
	$_____	$_____
	$_____	$_____

Q15. Do you expect any further expenses to be charged to this award after September 30, 1993? (Check one)

1. ☐ Yes

2. ☐ No

Q16. Please identify the indirect cost rate or rates that this institution received for this award between October 1, 1990 and September 30, 1993. Also, please identify the type of work supported by the rate (e.g. on-campus research, off-campus training, etc.) and the dates the rate(s) was (were) in effect.

Rate	Type	Dates
%		__/__/__ to __/__/__
%		__/__/__ to __/__/__
%		__/__/__ to __/__/__
%		__/__/__ to __/__/__

Q17. Was this institution required to share in the costs or provide matching funds for the award? (Check one)

1. ☐ No

2. ☐ Yes

Q18. Please identify the amount provided for the direct and indirect costs of this award by this institution in cash **AND** in-kind contributions. Include both mandatory cost share amounts and amounts in excess of the mandatory or provided voluntarily. **DO NOT** include any indirect costs in excess of negotiated rates as a voluntary cost share. (Enter amounts)

Cash Contributions:

	Mandatory Cost-Share Amount	Excess or Voluntary Cost-Share Amount
Direct costs	$_____	$_____
Indirect costs	$_____	$_____

In-Kind Contributions:

	Mandatory Cost-Share Amount	Excess or Voluntary Cost-Share Amount
Direct costs	$_____	$_____
Indirect costs	$_____	$_____

Q19. Were any the total shared costs or matching funds provided by a party outside this institution? (Check one)

1. ☐ No ⟹Go on to next award

2. ☐ Yes

Q20. Of the total amount shared or matched, how much was provided by an outside party? Please include both cash and in-kind contributions for both direct and indirect costs. (Enter amount in dollars)

	Cash Amount	In-Kind Amount
Direct costs	$_____	$_____
Indirect costs	$_____	$_____

GO ON TO NEXT AWARD. If no other awards, answer last question and then return questionnaire.

Q21. Would your institution like a copy of the report when it is issued? (Check one)

1. ☐ No

2. ☐ Yes ⟹ Fill in name and address you would like the report sent to below.

Name: _____

Address: _____

_____

_____

Thank you for your cooperation.

Congressionally Directed Projects Authorized in Fiscal Years 1991 Through 1993

Table III.1 contains information on congressionally earmarked DOT awards to universities. For each award we identified, the table lists (1) the amount of funds set aside by the Congress, (2) the recipient, (3) the purpose of the project, (4) the DOT agency making the award, (5) the amount of funds obligated by DOT as of September 30, 1993, (6) the requirements for matching funds, and (7) the origins of the congressional earmark.

In summary, we identified 91 earmarked projects to 46 universities. These projects set aside a total of about $178 million in DOT funds in fiscal years 1991 through 1993. This amount increased from about $12.6 million in fiscal year 1991 to $95.6 million in fiscal year 1993. Of the total, DOT had obligated about $110 million, or 62 percent of the designated funds, as of September 30, 1993. Forty-one of these awards required matching funds. For these awards, the required matching funds averaged about 38 percent of the federal funds earmarked.

FAA and FHWA received the most earmarked projects, 27 and 18, respectively (FAA and FHWA jointly provided funding for one additional award). FAA had the most funds set aside by congressional action, $65 million; FHWA had $29 million; FTA, $28.4 million; MARAD, $21.2 million; RSPA, $19.5 million; NHTSA, $9.3 million; the U.S. Coast Guard (USCG), $4.9 million; and FRA, $.4 million.

The data in this appendix differ from the data in the previous appendix on direct awards to universities in three ways: (1) the data include projects for which the Congress earmarked fiscal year 1991, 1992, or 1993 funds, even if DOT had not funded the awards to the intended recipient as of the end of fiscal year 1993; (2) they include awards that were made not directly to a university, but to a university through another entity, such as a state agency; and (3) they include awards made to a facility that is independent of a university but is located on a university campus or otherwise associated with a university, such as university hospitals or nonprofit laboratories.

Table III.1: Congressional Earmarks of DOT Funds to Universities in Fiscal Years 1991 Through 1993

Dollars in thousands

Amount	Recipient	Purpose	Agency[a]	Citation	Obligations[b]	Match	Source[c]
Fiscal year 1991							
$300	Fairmont State College	Computers for Mid-Atlantic Aviation Training & Education Center	FAA	House Report 101-892	$300	$150	S,C
$3,250	Minnesota Technical Colleges	Mid-American Aviation Resource Consortium: Air Traffic Controller Training	FAA	P.L. 101-516	$3,250	$0	H,C,L
$400	Northwestern University	Coatings Research Center	FHWA	House Report 101-584	$395	$0	H
$200	Oregon Graduate Institute	Electroslag Welding Research	FHWA	House Report 101-584	$194	$0	H,S
$900	Rutgers University	Robert Wood Johnson University Hospital Trauma Center	NHTSA	House Report 101-892	$900	$0	S,C
$1,256	Rutgers University	Graduate Research & Education in Aviation Technology	FAA	House Report 101-892	$1,073	$0	H,C
$900	Rutgers University-Camden	Cooper Hospital/ University Hospital Center: Trauma Center	NHTSA	House Report 101-892	$900	$0	S,C
$900	University of Medicine and Dentistry of New Jersey	University Hospital (Newark) Trauma Center	NHTSA	House Report 101-892	$900	$0	S,C
$2,000	University of Miami (FL)	Shock-Trauma Research at Jackson Memorial Hospital	NHTSA	House Report 101-892	$2,000	$0	H,C

(continued)

Dollars in thousands

Amount	Recipient	Purpose	Agency[a]	Citation	Obligations[b]	Match	Source[c]
$1,000	West Virginia University	Constructed Facilities Center: Fiber Reinforced Polymers Research	FHWA	House Report 101-892	$1,000	$0	S,C
$1,500	Wichita State University	National Institute of Aviation Research	FAA	House Report 101-892	$1,450	$0	H,C
Fiscal year 1992							
$3,000	Daniel Webster College	Airways Science Facilities & Equipment	FAA	House Report 102-243	$0	$1,050	S,C
$3,000	Dowling College	Airways Science Facilities & Equipment	FAA	House Report 102-243	$3,000	$1,050	H,C
$750	George Mason University	Center for Suburban Mobility	FTA[d]	House Report 102-243	$622	$0	H,C
$7,000	Georgetown University	Fuel Cell Bus Storage Facility	FTA	House Report 102-243	$7,000	$0	S,C
$1,000	Georgetown University	Buses Powered by Fuel Cells	FTA	House Report 102-243	$400	$0	H,S,C
$3,600	Georgetown University	Hybrid Fuel Cells	FTA	P.L. 102-240 sec. 1107(b)	$0	$720	H,C,L
$1,500	Georgia Institute of Technology & Rutgers University	Center of Excellence in Aviation Research	FAA	House Report 102-243	$1,500	$1,500	S,C
$1,500	Iowa State University	Center for Aviation Systems Reliability Laboratory	FAA	House Report 102-243	$1,500	$1,500	S,C
$1,200	Maine, Massachusetts, and New York Maritime Academies	Training Simulators	MARAD	P.L. 102-140	$1,200	$600	S,C,L
$1,250	Massachusetts Maritime Academy	Massachusetts Center for Marine Environmental Protection: Oil Spill Simulator	USCG	P.L. 102-587 sec. 5006	$1,500	$0	L

(continued

Dollars in thousands

Amount	Recipient	Purpose	Agency[a]	Citation	Obligations[b]	Match	Source[c]
$250	Middle Tennessee State University	Airways Science Facilities & Equipment	FAA	House Report 102-243	$0	$88	H,C
$2,000	Minnesota Technical Colleges	Mid-American Aviation Resource Consortium: Air Traffic Controller Training	FAA	P.L. 102-143	$2,000	$0	H,C,L
$2,242	Monmouth College	Jim Howard Transportation Information Center	FHWA	P.L. 102-240 sec. 6023	$2,220	$448	H,C,L
$1,000	Morgan State University	University Transportation Center: Transportation Management	RSPA	P.L. 102-240 sec. 6023	$500	$500	H,C,L
$1,000	New Jersey Institute of Technology	University Transportation Center: Transportation Productivity	RSPA	P.L. 102-240 sec. 6023	$500	$500	H,C,L
$1,000	North Carolina A&T University	University Research Institute: Urban Transit Institute	RSPA	P.L. 102-368 sec. 801	$1,000	$250	H,L
$989	North Dakota State University	Airways Science Facilities & Equipment	FAA	House Report 102-243	$989	$346	S,C
$125	North Dakota State University	Shortline Railroad Database Development	FRA	House Report 102-243	$125	$0	S,C
$4,000	Northeast Louisiana University	Airways Science Facilities & Equipment	FAA	House Report 102-243	$4,000	$1,400	S,C
$3,000	Northwestern University	University Research Institute: Infrastructure Technology	RSPA	P.L. 102-240 sec. 6024	$3,000	$750	H,C,L
$150	Oregon Graduate Institute	Railroad Welding & Metallurgy	FRA	P.L. 102-143	$100	$0	S,C,L
$3,000	Rutgers University	National Transit Institute	FTA	P.L. 102-240 sec. 6022	$2,994	$0	H,C,L

(continued)

Dollars in thousands

Amount	Recipient	Purpose	Agency[a]	Citation	Obligations[b]	Match	Source[c]
$250	San Jose State University	University Research Institute: Surface Transportation Policy	RSPA	P.L. 102-240 sec. 6024	$250	$63	H,C,L
$3,000	Southern University	Airways Science Facilities & Equipment	FAA	House Report 102-243	$0	$1,050	S,C
$300	Stevens Institute of Technology	New Jersey Marine Sciences Consortium: Fishing Vessel Safety Education Materials	USCG	House Report 102-243	$300	$0	S,C
$2,000	State University of New York, Buffalo	Earthquake Effects on Bridges & Highways Research	FHWA	P.L. 102-240 sec. 6005(a)	$2,000	$0	H,C,L
$1,250	Texas A&M, Galveston: Texas Maritime Academy	Texas Center for Marine Training and Safety: Oil Spill Simulator	USCG	P.L. 102-587 sec. 5006	$0	$0	L
$1,000	University of Arkansas	University Transportation Center: Rural Transportation	RSPA	P.L. 102-240 sec. 6023	$500	$500	H,C,L
$2,500	University of Idaho	Advanced Transportation Technology Center	FHWA	P.L. 102-240 sec. 6023	$2,500	$500	C,L
$1,000	University of Miami (FL)	International Oceanographic Foundation: South Florida Oil Spill Research Center	USCG	House Report 102-243	$1,000	$0	H,C
$2,000	University of Miami (FL)	Shock-Trauma Research at Jackson Memorial Hospital	NHTSA	House Report 102-243	$2,000	$0	H,C
$1,000	University of Minnesota	University Research Institute: IVHS Concepts	RSPA	P.L. 102-240 sec. 6024	$1,000	$250	H,C,L

(continuec

Dollars in thousands

Amount	Recipient	Purpose	Agency[a]	Citation	Obligations[b]	Match	Source[c]
$750	University of Minnesota	Humphrey Institute: Transportation Policy	FHWA	House Report 102-243	$750	$0	H,C
$1,000	University of North Carolina	University Research Institute: Transportation Research & Education	RSPA	P.L. 102-240 sec. 6024	$1,000	$250	H,C,L
$1,000	University of North Carolina	North Carolina Geographic Information System	FHWA	House Report 102-243	$1,041	$0	H,C
$2,000	University of North Dakota	Airways Science Facilities & Equipment	FAA	House Report 102-243	$2,000	$700	H,S,C
$1,000	University of South Florida	University Research Institute: Urban Transit Institute	RSPA	P.L. 102-240 sec. 6024	$1,000	$250	H,C,L
$1,000	University of Wyoming	Western Research Institute: Rubberized Pavements Research	FHWA	P.L. 102-240 sec. 1038(b)	$0	$0	S,C,L
$3,000	University of Wyoming	Fundamental Properties of Asphalt Research	FHWA	P.L. 102-240 sec. 6016	$3,000	$0	S,C,L
$350	West Virginia University	Lightweight Vehicles Research	NHTSA	House Report 102-243	$350	$0	S,C
$1,000	West Virginia University	Constructed Facilities Center: Non-Destructive Evaluation	FHWA	House Report 102-243	$1,000	$0	S,C
$1,414	Wichita State University	National Institute for Aviation Research	FAA	House Report 102-243	$1,414	$0	H,C
Fiscal year 1993							
$3,000	Barry University (FL)	Transportation Resource Center	FAA & FHWA	P.L. 102-388 sec. 334	$3,000	$0	H,C,L

(continued)

Dollars in thousands

Amount	Recipient	Purpose	Agency[a]	Citation	Obligations[b]	Match	Source[c]
$175	Central Washington University	Airways Science Facilities	FAA	House Report 102-924	$0	$61	S,C
$500	Cleveland Clinic Institute & Ohio State University	Human Factors & Pilot Error in Air Accidents	FAA	P.L. 102-388	$500	$0	S,C,L
$4,500	Dowling College	Airways Science Facilities & Equipment	FAA	House Report 102-924	$0	$1,575	H,S,C
$11,500	Embry-Riddle Aeronautical University	Airways Science Facilities & Equipment	FAA	House Report 102-924	$0	$4,025	H,C
$3,000	Florida International University & University of South Florida	Transit Planning & Research	FTA	House Report 102-924	$3,000	$0	H,C
$1,600	George Mason University	Center for Suburban Mobility: IVHS Research	FHWA	House Report 102-924	$1,600	$0	H,C
$5,100	Georgetown University	Fuel Cell Bus Facility	FTA	House Report 102-924	$4,880	$0	S,C
$2,000	Georgetown University	Fuel Cell Buses	FTA	House Report 102-639	$950	$0	H,S
$2,235	Henderson State University	Airways Science Facilities & Equipment	FAA	House Report 102-924	$0	$782	S,C
$16,000	Maine Maritime Academy	Ship Conversion	MARAD	P.L. 102-395	$2,236	$0	S,C,L
$556	Middle Tennessee State University	Airways Science Facilities	FAA	House Report 102-924	$0	$195	H,S,C
$2,000	Minnesota Technical Colleges	Mid-American Aviation Resource Consortium: Air Traffic Controller Training	FAA	P.L. 102-388	$2,000	$0	H,C,L
$1,000	Morgan State University	University Transportation Center: Transportation Management	RSPA	P.L. 102-240 sec. 6023	$0	$1,000	H,C,L

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Dollars in thousands

Amount	Recipient	Purpose	Agency[a]	Citation	Obligations[b]	Match	Source[c]
$1,000	New Jersey Institute of Technology	University Transportation Center: Transportation Productivity	RSPA	P.L. 102-240 sec. 6023	$0	$1,000	H,C,L
$3,000	Northwestern University	University Research Institute: Infrastructure Technology	RSPA	P.L. 102-240 sec. 6024	$3,000	$750	H,C,L
$100	Oregon Graduate Institute	Railway Welding & Metallurgy	FRA	P.L. 102-388	$100	$0	H,S,C,L
$3,000	Rutgers University	National Transit Institute	FTA	P.L. 102-240 sec. 6022	$3,000	$0	H,C,L
$250	San Jose State University	University Research Institute: Surface Transportation Policy Study	RSPA	P.L. 102-240 sec. 6024	$250	$63	H,C,L
$1,925	Southern University	Airways Science Facilities & Equipment	FAA	House Report 102-924	$0	$674	S,C
$90	Stevens Institute of Technology	New Jersey Marine Science Consortium: Improvements in Oil Spill Containment Boom	USCG	House Report 102-924	$90	$0	S,C
$2,000	State University of New York, Buffalo	Earthquake Effects on Bridges & Highways Research	FHWA	P.L. 102-240 sec. 6005(a)	$2,000	$0	H,C,L
$4,000	Texas A&M, Galveston: Texas Maritime Academy	Convert Navy Ship	MARAD	P.L. 102-395	$1,218	$0	C,L
$1,600	University of California, San Diego	Composite Material in Bridge Construction	FHWA	House Report 102-924	$1,600	$0	H,C
$6,884	University of Alaska, Anchorage	Airways Science Facilities & Equipment	FAA	House Report 102-924	$0	$2,409	S,C

(continued)

Dollars in thousands

Amount	Recipient	Purpose	Agency[a]	Citation	Obligations[b]	Match	Source[c]
$1,000	University of Arkansas	University Transportation Center: Rural Transportation	RSPA	P.L. 102-240 sec. 6023	$1,000	$1,000	H,C,L
$3,000	University of Idaho	Advanced Transportation Technology Center	FHWA	P.L. 102-240 sec. 6023	$3,000	$600	C,L
$1,000	University of Miami (FL)	International Oceanographic Foundation: South Florida Oil Spill Research Center	USCG	P.L. 102-388 sec. 365	$1,000	$0	H,C,L
$2,250	University of Miami (FL)	Jackson Memorial Hospital: Shock-Trauma Facility	NHTSA	House Report 102-924	$2,250	$0	H,C
$1,000	University of Minnesota	University Research Institute: IVHS Concepts	RSPA	P.L. 102-240 sec. 6024	$0	$250	H,C,L
$760	University of Minnesota	Humphrey Institute: IVHS and the Environment	FHWA	House Report 102-924	$760	$0	H,C
$400	University of New Mexico & New Mexico State University	Strategic Alliance for Transportation Research: Non-Destructive Evaluation of Bridges	FHWA	House Report 102-924	$400	$0	S,C
$2,225	University of North Dakota	Airways Science Equipment	FAA	House Report 102-924	$2,225	$779	H,S,C
$1,000	University of North Carolina	University Research Institute: Transportation Research & Education	RSPA	P.L. 102-240 sec. 6024	$0	$250	H,C,L
$1,000	University of North Carolina	Kenan Institute: Air Cargo Manufacturing Facility Study	FAA	House Report 102-924	$1,000	$1,000	H,S,C

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Dollars in thousands

Amount	Recipient	Purpose	Agency[a]	Citation	Obligations[b]	Match	Source[c]
$1,000	University of South Florida & North Carolina A&T University	University Research Institute: Urban Transit Institute	RSPA	P.L. 102-240 sec. 6024	$0	$250	H,C,L
$3,000	University of Wyoming	Fundamental Properties of Asphalt Research	FHWA	P.L. 102-240 sec. 6016	$622	$0	S,C,L
$1,000	Wichita State University	National Institute for Aviation Research	FAA	House Report 102-924	$1,000	$0	H,C

[a]DOT operating administration making the award. See p. 15 for abbreviations.

[b]Total amount obligated for the project as of September 30, 1993.

[c]Legislative origins of earmarks. Indicates discussion in House Report or bill (H), Senate Report or bill (S), Conference Report (C), or enacted legislation (L).

[d]The Federal Transit Administration (FTA) was previously known as the Urban Mass Transit Administration (UMTA).

Scope and Methodology

In your April 6, 1993, request letter, you asked that we provide information on awards made by the Department of Transportation to universities, including details on the amounts spent on indirect costs and on various categories of direct costs, such as faculty salaries, travel, and facility construction. In order to gather the requested information, we first requested that DOT and its operating administrations provide us with detailed data on each of their awards to universities made in federal fiscal years 1991 through 1993. DOT was unable to provide the requested information because it did not have complete or accurate information on each of the awards it had made. First, DOT provided us with its input to an annual report by the National Science Foundation (NSF), which is supposed to list the total amount each operating administration awarded to each institution during the past fiscal year. The most recent NSF data available were for fiscal years 1991 through 1992. However, in comparing these data to award data provided by DOT's operating administrations, we found that some schools that had received funding were not listed in the NSF study data. In addition, we identified additional institutions that had received awards but were not included in the NSF data through agency publications describing university programs and data on congressionally earmarked awards. In total, we identified 206 institutions that had reportedly received DOT funding in fiscal years 1991 through 1993.

We developed and tested a questionnaire that was sent to each of the 206 institutions (see pp. 28-31), which asked for detailed information about each of its DOT awards made during fiscal years 1991 through 1993. Those institutions that did not respond received follow-up inquiries in January and March 1994. For each institution that responded, we compared its responses to the information we had previously gathered on which administrations had provided it with funding. We contacted any institution that reported data that conflicted with other data sources or otherwise required clarification. As of April 20, 1994, we had valid responses to our questionnaire from 187 institutions (90.1 percent). Of those total valid responses, 46 institutions reported that they had not received any new awards from DOT during the period. The remaining 141 respondents reported at least one new DOT award during the period. Data on awards made outside the period of the questionnaire, if returned, were not included in our data set.

To obtain specific information on congressional earmarks to universities in fiscal years 1991 through 1993, we included questions on earmarking in the questionnaire sent to universities. We also analyzed congressional appropriation and authorizing laws with funding for DOT and related

congressional committee reports to identify transportation funding earmarked to universities for fiscal years 1991 through 1993. To provide a complete listing of congressional earmarks, we included the following types of projects in our review: projects not funded as of the end of fiscal year 1993, awards in which the recipient was not identified by name but was otherwise described by congressional action, and awards made to facilities that are independent of a university but are located on a university campus or otherwise associated with a university. DOT officials verified our information and provided additional information on the amount of funds obligated to universities and matching fund requirements.

To address the objective on how DOT and its operating administrations plan and track their university research activities, we examined policies and procedures within the Department for planning and tracking its university research activities. For those DOT organizations with research and development plans, we reviewed the plans to determine if they (1) consistently identified research goals and objectives and (2) addressed cross-modal issues and programs. We also examined DOT's information systems on grants and contracts to assess the completeness of these systems.

To assess how DOT and its operating administrations oversee the financial aspects of their awards to universities, we examined their policies and procedures for monitoring the financial aspects of university research. We also reviewed Office of Management and Budget circulars governing the oversight of awards to universities by federal agencies. To obtain information on allowable costs charged by universities, we interviewed officials at the Department of Health and Human Services and the Department of Defense's Office of Naval Research and Defense Contract Audit Agency responsible for establishing indirect cost rates for universities and auditing indirect and direct costs. Furthermore, we reviewed 50 awards made by the administrations to the universities to assess the completeness of the files and compliance with the appropriate policies and procedures. We judgmentally selected these awards because DOT could not provide information on the universe from which to draw a representative sample.

Furthermore, to obtain information on specific responsibilities and efforts for planning, tracking, and oversight of university research activities within the Department, we interviewed officials in the Office of the Secretary of Transportation and the operating administrations' R&D programs, university research programs, and grants and contracting

offices located in Washington, D.C. We also interviewed research, grant, and contracting personnel at the Federal Aviation Administration's Technical Center, Atlantic City, NJ; Federal Highway Administration's Turner-Fairbank Highway Research Center, McLean, VA; and Research and Special Programs Administration's Volpe National Transportation Systems Center located in Cambridge, MA.

Finally, we visited eight universities—George Mason University, Fairfax, VA; Massachusetts Institute of Technology, Cambridge, MA; Pennsylvania State University, State College, PA; North Carolina A&T University, Greensboro, NC; Texas A&M University, College Station, TX; University of Michigan, Ann Arbor, MI; University of South Florida, Tampa, FL; and Florida International University, Miami, FL—and interviewed the officials responsible for managing their awards from DOT as well as researchers doing research for DOT. The purpose of these visits was to obtain information on DOT's oversight of the awards, review university award files, and discuss the general purposes of the research being done for DOT. These eight universities were selected because they received funding from more than one operating administration in fiscal years 1991 through 1993 or were either a DOT Center of Excellence or a participant in DOT's University Transportation Centers Program.

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