

123644
~~27745~~

BY THE U.S. GENERAL ACCOUNTING OFFICE
**Report To The Chairman, Subcommittee On
Investigations And Oversight, Committee
On Public Works And Transportation
U.S. House Of Representatives**

Types Of Work Performed Using Resurfacing, Restoration, Rehabilitation, And Reconstruction Federal Highway Funds

This report discusses how seven states used Federal Highway Administration funds for resurfacing, restoring, rehabilitating, and reconstructing federal-aid Interstate and non-Interstate highways. GAO found that 57 percent of Interstate funds and 59 percent of non-Interstate funds were used for road resurfacing. Another 21 percent of Interstate funds were used for reconstruction while 22 percent of non-Interstate funds were used for minor road widening.

GAO also reviewed Federal Highway Administration maintenance inspection reports to identify any states that were deferring their responsibility to maintain federal-aid highways so that the roads would deteriorate to such an extent that they would be eligible for federal funds. Although these reports did not contain any evidence of such deferrals, they showed that the Administration's New York office approved the use of federal funds for deferred maintenance involving the sealing of joints on cement highways. The Administration has traditionally considered this work to be a state maintenance responsibility and not eligible for federal funding.

GAO recommends that the Administrator, Federal Highway Administration, review the decision which allowed federal funds to be used for joint sealing.



123699

028336

GAO/RCED-84-83
FEBRUARY 29, 1984

Request for copies of GAO reports should be sent to:

**U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20760**

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are \$3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are \$1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

RESOURCES, COMMUNITY,
AND ECONOMIC DEVELOPMENT
DIVISION

B-212809

The Honorable Elliott H. Levitas
Chairman, Subcommittee on Investigations
and Oversight
Committee on Public Works and Transportation
House of Representatives

Dear Mr. Chairman:

In a January 24, 1983, letter, you requested that we obtain certain information on two federal-aid highway programs: the Interstate Resurfacing, Restoration, Rehabilitation, and Reconstruction Program (4R) and the Non-Interstate Resurfacing, Restoration, and Rehabilitation Program (3R) administered by the Federal Highway Administration (FHWA), Department of Transportation. Specifically, you requested information on the following questions:

- What are Interstate 4R and non-Interstate 3R funds being used for?
- Is the legislative requirement that 20 percent of federal-aid non-Interstate primary and secondary funds¹ be used for 3R-type work adequate?
- Are Interstate 4R and non-Interstate 3R funds being used effectively?

As agreed, we limited our work on the effective use of funds to determining how the states select Interstate 4R and non-Interstate 3R projects and whether cost-benefit analysis or comparative costing is used in the project selection process. We did not determine whether the projects selected were the most "effective" of those considered. In addition, we agreed to review FHWA maintenance reports to identify any states that were deferring maintenance on Interstate highways so that the roads would deteriorate to such an extent that they would be eligible for 4R funding.

¹States receive federal funds to perform highway work on routes designated as part of the federal-aid system. The federal-aid system includes the Interstate, Primary, Secondary, and Urban Systems. Funds are apportioned to each system according to formulas prescribed by law.

An earlier report to you dealt with the number and types of exceptions to new construction standards that FHWA approved for non-Interstate 3R projects. (See GAO/RCED-84-69, dated Dec. 23, 1983.) As agreed with your office, we included the same states in this review--Colorado, Georgia, Illinois, Montana, New Jersey, New York, and Wisconsin.

Resurfacing was the predominant use of Interstate 4R funds in all states we reviewed except New York and Georgia and the predominant use of non-Interstate 3R funds in all states except New York. New York used both its Interstate 4R and non-Interstate 3R funds primarily for bridge rehabilitation. Georgia used its 4R funds primarily for reconstruction. All seven states met the legislative requirement to use 20 percent of primary and secondary funds for 3R work. No problems are anticipated in meeting the requirement in the future. Most state officials, although they had no problem meeting the requirement, said that the requirement was unnecessary because their greatest highway need is for 3R/4R-type work.

States used different approaches to identify, rank, and select projects. Two states have recently developed new processes for selecting projects that may result in needs being addressed on a more systematic basis. Most states did not use cost-benefit analyses or comparative costing when selecting resurfacing, restoration, and rehabilitation projects. However, some states did use these techniques for reconstruction projects. We found no evidence that the states were deferring maintenance in anticipation of federal funds; however, FHWA's New York office has approved federal funds for deferred maintenance involving sealing road joints. FHWA has traditionally considered this to be a state maintenance responsibility and not eligible for federal funding.

We reviewed the records of 113 Interstate projects authorized between October 1, 1980, and September 30, 1982, and 173 non-Interstate projects that FHWA authorized between October 1, 1980, and June 30, 1982, in the seven states. We performed our work at FHWA headquarters and its field offices responsible for the program in these states and the state departments of transportation. We also visited state transportation district offices in each of the seven states. Appendix I provides details on our scope and methodology.

DESCRIPTION OF 3R AND 4R PROGRAMS

Over the last few years the focus of the federal-aid program has been expanded to include preserving and reconstructing existing roads as well as constructing new roads. The Federal-aid Highway Act of 1976 (Public Law 94-280) allowed federal funds to be used for the first time for preservation work such as resurfacing, restoration, and rehabilitation (3R) work on Interstate and non-Interstate federal-aid roads. The primary purpose of this work is to prolong and preserve the service life of existing

roads. Restoration and rehabilitation work includes repairs such as strengthening roadway bases, drainage work, or shoulder work so that additional work, such as resurfacing, can be done. States cannot use federal-aid funds for routine maintenance such as patching potholes, mowing grass, removing debris, or plowing snow.

The Federal-Aid Highway Act of 1978 (Title I of Public Law 95-599) provided specific funding for non-Interstate 3R work by requiring that for fiscal years 1979-82 not less than 20 percent of primary and secondary highway funds² be used for 3R work. This requirement was established in recognition that the nation's non-Interstate roads are deteriorating and efforts must be focused on preserving existing roads rather than constructing new ones. Other federal funds can also be used for 3R work. The act provided a separate authorization for funding Interstate 3R work.

The Federal-Aid Highway Act of 1981 (Public Law 97-134) established the Interstate 4R program by expanding the Interstate 3R program to include reconstruction. Reconstruction is not considered preservation work because it involves removing and replacing the road rather than extending the life of an existing road surface. In defining reconstruction, FHWA also includes functional improvements to the road, such as major widening to provide continuous lanes and adding or revising interchanges.

The act also limited the use of Interstate construction funds to only that work necessary to provide a minimum level of acceptable service on the Interstate System. All other work that was previously eligible for Interstate construction funds became eligible for 4R funds. This work, referred to in this report as non-preservation work, includes rest areas and associated facilities; bicycle, pedestrian, and equestrian trails; landscape plantings; fringe parking lots; bridge deck protective systems; and safety upgrading.

The Surface Transportation Assistance Act of 1982 (Public Law 97-424, Jan. 6, 1983) added reconstruction to the non-Interstate 3R program by requiring that in fiscal year 1984, states must use 40 percent of their non-Interstate primary, secondary, and urban funds for 4R work. Because our sample consisted

²The federal-aid system includes Primary, Interstate, and Secondary Systems. The Primary System consists of rural arterials and their extensions in urban areas. Arterials are those routes that enable the quick movement of large numbers of vehicles from one place to another and are characterized by long-distance travel, high traffic volumes, and high speeds. Interstates are technically part of the Primary System but are generally referred to as a separate system. The Secondary System consists of rural major collector routes which funnel traffic to and from the arterial highways.

of projects that were approved prior to January 1983 when we began our audit work, our non-Interstate sample included only 3R projects.

PROGRAM FUNDS USED PREDOMINANTLY FOR RESURFACING

Resurfacing was the predominant improvement made with both Interstate 4R funds and non-Interstate 3R funds. About 57 percent, or about \$69.2 million, of the Interstate 4R funds obligated for the projects we reviewed and 59 percent, or about \$60.3 million, of the non-Interstate 3R funds obligated for the projects we reviewed were used for resurfacing. Other uses of 4R funds included reconstruction work, nonpreservation work, and bridge rehabilitation. Other uses of 3R funds were for minor widening and bridge rehabilitation.

Improvements made with Interstate 4R funds

Interstate 4R funds were used for several kinds of improvements, as shown below. Appendix II provides information on the types of improvements made with Interstate 4R funds for each of the seven states.

Obligations for Projects by Type of Improvement

<u>Type of improvement</u>	<u>Obligations^a (from Oct. 1980 to Sept. 1982)</u>	<u>Percent of total</u>
	(millions)	
Resurfacing	\$ 69.2	57.0
Reconstruction	25.1	20.7
Nonpreservation work	10.0	8.2
Bridge rehabilitation	7.3	6.0
Miscellaneous (includes road widening, resto- ration and rehabili- tation, minor bridge work, and road shoulder work)	<u>9.9</u>	<u>8.1</u>
Total	<u>\$121.4</u>	<u>100.0</u>

^aTotal does not add due to rounding.

In five of the seven states--Colorado, New Jersey, Montana, Illinois, and Wisconsin--resurfacing was the predominant type of work. Among these states the proportion of Interstate 4R funds obligated for resurfacing projects we reviewed varied from a low of 33.1 percent in Colorado to a high of 94.4 percent in Montana.

Appendix III contains a descriptive summary of the resurfacing projects in these five states.

Reconstruction was the second major use of Interstate 4R funds and the major use of 4R funds in Georgia. Georgia's reconstruction projects accounted for \$23.7 million, or 94.4 percent, of the total funds obligated for reconstruction in the seven states. Georgia used the 4R funds primarily for adding lanes, rebuilding interchanges, and replacing bridges as part of its long-range effort to expand the capacity of and improve the Interstate System in Georgia. Appendix IV provides a description of Georgia's five reconstruction projects.

The third major use of Interstate 4R funds was for nonpreservation work that became eligible for 4R funds in 1981. The extent to which states used 4R funds for nonpreservation work ranged from a high of \$5.3 million in New Jersey to only \$11,000 in Montana. The average cost of the nonpreservation projects in our sample was \$344,000. Appendix V contains a descriptive summary of the nonpreservation projects in the seven states.

About \$7.3 million of the Interstate 4R funds was obligated for 17 bridge rehabilitation projects, 11 of which were in New York. New York obligated about \$5.1 million, or about 50 percent, of its 4R funds for bridge rehabilitation projects, primarily bridge deck repairs.

The remaining \$9.9 million in Interstate 4R funds was used for various types of improvements, including road widening, restoration and rehabilitation, minor bridge work, and shoulder work.

Improvements made with non-Interstate 3R funds

Resurfacing was the predominant type of improvement made with non-Interstate 3R funds in all states except New York. Minor widening work was the next most common use of 3R funds. Bridge rehabilitation was the third most common use and the predominant use of 3R funds in New York. The following table provides additional detail. Appendix VI provides information on the types of improvements made with non-Interstate funds for each of the seven states.

Obligations for Projects by Type of Improvement

<u>Type of improvement</u>	<u>Obligations</u> (from Oct. 1980 to June 1982) (millions)	<u>Percent</u> <u>of total</u> ^a
Resurfacing	\$ 60.3	59.4
Minor widening	21.9	21.5
Bridge rehabilitation	10.0	9.8
Miscellaneous (includes restoration and rehabilitation, bridge replacement, reconstruction, and shoulder work)	<u>9.3</u>	<u>9.2</u>
Total	<u>\$101.5</u>	<u>100.0</u>

^aTotal does not add due to rounding

In the six states where resurfacing was predominant, the proportion of non-Interstate 3R funds obligated for resurfacing projects ranged from a low of 45.4 percent in New Jersey to a high of 94 percent in Montana. Appendix VII contains a descriptive summary of the resurfacing projects in those states where it was the predominant work.

Minor widening, which FHWA defines as the addition of 2 or more feet of width per lane to the roadway without adding lanes, accounted for at least 22 percent of non-Interstate 3R funds obligated in four of the states. Appendix VIII contains a descriptive summary of the minor widening projects in those states.

There were 15 bridge rehabilitation projects involving non-Interstate 3R funds, 13 of which were in New York. New York used \$8.9 million, or 38.2 percent, of its 3R funds for the bridge rehabilitation projects. A majority of these projects involved bridge deck repairs.

STATES HAVE NO PROBLEMS IN MEETING
THE MINIMUM SPENDING REQUIREMENT

According to Federal Highway Administration reports for fiscal years 1979 and 1980, all seven states met the requirement that 20 percent of a state's non-Interstate primary and secondary highway funds be used for 3R work. States were close to meeting the requirement for fiscal year 1981, and all but one of the states were close to meeting the requirement for fiscal year 1982. (States have 4 years to spend a specific fiscal year's highway funds; for example, states have until 1985 and 1986 to meet the 1981 and 1982 requirements.)

Officials in the seven states said that they did not have any problem meeting the 1978 highway act requirement that 20 percent of a state's non-Interstate primary and secondary highway funds be used for 3R work. Also, they said they did not foresee problems in meeting the 1982 Surface Transportation Assistance Act requirement that states must spend 40 percent of their non-Interstate primary, secondary, and urban funds for non-Interstate 4R work. Further, most state officials said that these requirements were not necessary because states are currently doing primarily 3R/4R-type work and very little new construction.

PROJECT SELECTION PROCESS

Project selection is essentially a state responsibility, and other than approving the state's annual program that details how the state plans to use federal-aid funds, FHWA has little involvement in project selection. As discussed in appendix IX, the states use various methods in their project selection process. Montana and Colorado have recently developed new selection processes that provide more objective data for identifying and ranking projects. These processes may result in needs being addressed on a more systematic basis.

New York's project selection process is decentralized and relies on the engineering judgment of district engineers. In the two state transportation districts we visited, district office engineers identify needed work using highway condition, capacity, and safety data, and agree on project priorities using these data.

Colorado's old system was somewhat similar to New York's-- district engineers identified, ranked, and selected projects. However, a state task force criticized the system's lack of consistent criteria or guidelines for selecting projects. To address concerns of the task force, Colorado developed a new system, implemented in July 1982, that identifies statewide Interstate 4R, primary, and secondary highway needs by work type (resurfacing, minor construction, etc.) using sufficiency data. These data measure a highway's pavement condition, skid resistance, structural condition, hazard index, and traffic capacity. In addition, the system establishes priorities by work type, allocates funds to work categories and then to districts based on the number of deficient miles, and will eventually rank projects planned for the 4-year period beginning in July 1984 by assigning weights to the five elements of the sufficiency data. (Until the new ranking system takes effect, priorities are being established using the old system.) Although district engineers will still make the final selection of projects, the new system will give them objective data to use when selecting the most appropriate projects.

Similarly, Montana developed a new project selection process to address concerns of the state legislature that the old system was arbitrary and lacked objective criteria for selecting projects. Under the new system, local officials and state

construction and maintenance divisions will initiate the majority of projects, but FHWA may also suggest projects. After the state transportation central office screens projects, they will be ranked based on a cost-effectiveness index. This index will rate each proposed project on the Interstate and Primary Systems using highway sufficiency ratings (measures a highway's foundation, surface, and drainage adequacy, safety, and traffic capacity), the average daily traffic volume, the lifetime of the improvement, and the estimated cost per mile.

A preliminary list of projects for each financial district, tentatively ranked by the index and reviewed for financial feasibility, will be sent to each state transportation district for review by construction and maintenance supervisors. After receiving the districts' recommended changes, the state central office will make the final cost-effectiveness ranking of projects statewide. Using this cost-effectiveness ranking and considering factors such as whether preliminary design has been completed and the project is ready to proceed with construction, and whether project funds are distributed equitably among the financial districts, the state will develop 1-year, 2-year, and multiyear transportation plans.

Montana's selection process was the only one that systematically compared cost in ranking all types of projects. The six other states did not use comparative costing techniques or cost-benefit analyses to rank all proposed projects. Officials in five of the six states said that cost was a factor considered in project rankings but formal cost studies were not done.

Five states sometimes used cost-benefit analyses or comparative costing for specific types of projects. Wisconsin, Colorado, Illinois, and Georgia used such techniques for major reconstruction projects to determine whether a particular project should be done or to select among design alternatives--for example, to decide whether to add one or two lanes, or to use a certain type of pavement. One of New York's districts, on the other hand, used such techniques for bridge rehabilitation projects to select design alternatives and establish rankings. Officials in these five States said that for those projects for which cost-benefit analyses or comparative costing were not done, engineering judgment, based on pavement condition and other factors, was sufficient to determine the scope of the work and establish project rankings. Traffic volume and accident data were some of the factors considered.

MAINTENANCE INSPECTION REPORTS CITE
INSTANCES OF DEFERRED MAINTENANCE

According to federal-aid highway legislation (23 U.S.C. 116(a)(1982)), maintenance is a state responsibility. Maintenance preserves the useful life of a highway and effectively reduces or delays the need for costly 4R-type work. FHWA monitors the states' maintenance efforts and inspects highways to ensure that

they are properly maintained. FHWA can apply sanctions pursuant to 23 U.S.C. 116(1982) if it finds that a state is not properly maintaining its federal-aid roads. FHWA has interpreted "not properly maintaining" to mean when a road becomes unsafe or unserviceable. FHWA maintenance inspection reports show that although there were some exceptions, generally highways were satisfactorily maintained during the period covered by our review in all the seven states. Reports for New York and New Jersey showed instances of deferred maintenance, but the reports did not contain any evidence that these states were deferring maintenance so that the roads would deteriorate to such extent that they would be eligible for 4R funds. Instances of deferred maintenance in New York and New Jersey are being corrected. New York's deferred maintenance work is discussed below because FHWA considered it serious enough to consider withholding federal-aid funds.

The FHWA New York office's 1979-82 maintenance inspection reports discussed problems in sealing joints in concrete (portland cement) highways and in repairing and sealing joints and cleaning scuppers (drains) of New York City bridges. According to FHWA, water and debris can infiltrate unsealed joints in the pavement and cause cracking of concrete slabs. Plugged bridge drains cause water to remain on bridge decks, and because bridge joints are not kept sealed, the water leaks through the joints, causing corrosion and deterioration to the bridge steel and substructure concrete. A February 1982 memorandum from the FHWA New York Administrator to the State Department of Transportation discussed a state estimate of a \$6-million backlog for cement joint sealing and a New York City estimate of a \$10-million backlog for bridge joint repair and sealing. FHWA's New York office attributed the deferred maintenance to decreasing state financial resources and a corresponding increase in needed maintenance work.

In a February 1982 memorandum from the FHWA New York Administrator to the State Assistant Commissioner of Operations for the State Department of Transportation, the Administrator discussed withholding federal-aid Interstate funds and stated that although some progress had been made in assessing these maintenance problems, the state had programmed few joint sealing highway projects and had not started a program for repair of bridge joints. Further, the memorandum stated that if programs for statewide joint sealing and New York City bridge rehabilitation/sealing were not developed and instituted on the Interstate System in calendar year 1982, the New York office would withhold federal-aid funds. According to an FHWA New York maintenance engineer, New York State's program for sealing joints became operational in calendar year 1983 and the consideration of withholding federal funds was dismissed.

In addition to the deferred maintenance issue, New York's joint sealing projects are discussed in the next section in terms of the approval of federal funds for such work.

FHWA NEW YORK OFFICE APPROVES
FEDERAL FUNDS FOR WORK TRADITIONALLY
CONSIDERED MAINTENANCE

Federal highway legislation (23 U.S.C. 101 (1982)) does not specify what types of highway work are considered maintenance. FHWA defines the types of work that are maintenance and has traditionally considered maintenance to include work such as patching potholes, mowing grass, removing debris, plowing snow, and sealing joints.

In February 1981, the FHWA New York office notified New York that sealing joints was eligible for federal funding even though this work has traditionally been considered maintenance and, as such, a state responsibility. According to FHWA's New York Administrator, expanding federal funding to sealing joints would extend the service life of the highways and allow more efficient use of state maintenance funds.

The decision to use federal funds for sealing joints, however, is not consistent with overall FHWA policy, and FHWA headquarters has not provided any information to support a policy change that sealing joints is not normal maintenance. For example, FHWA's Maintenance Review Manual states that the sealing of joints is a maintenance function, and pertinent legislation (23 U.S.C. 116(a)(1982)) makes states responsible for maintaining those highways constructed with federal-aid funds. Furthermore, the FHWA New York office's prior maintenance inspection reports refer to the lack of joint sealing work as deferred maintenance, and the FHWA New York office, pursuant to 23 U.S.C. 116(a) and 119(b)(1982), in February 1981 discussed withholding federal-aid funds if New York did not develop a joint sealing program. These sections of the law permit withholding of funds when states are not performing their maintenance function.

According to the Director of FHWA's Office of Engineering, FHWA would not consider sealing joints eligible for federal-aid funds as a national policy. However, he said that if New York's Administrator believes that using federal-aid funds for sealing joints is cost effective, FHWA headquarters would defer to his judgment. The Director acknowledged that more guidance may be needed on defining maintenance but stated that establishing national policy in this area is difficult due to variations in state circumstances.

FHWA has considered sealing of joints to be maintenance by defining it as such in its inspection manual and by considering applying legal sanctions for the state's lack of maintenance. Therefore, we question the FHWA New York office's approval of federal funds for sealing joints, because, as maintenance, such work is not eligible for federal funding.

RECOMMENDATION

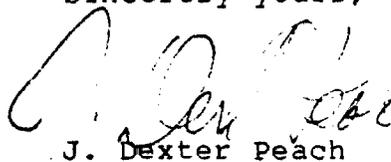
We recommend that the Administrator, FHWA, review the New York office's decision to fund the sealing of joints to determine whether such work, which has traditionally been considered as maintenance, should be eligible for funding. Further, if the Administrator determines that joint sealing is eligible for federal funding, we recommend that FHWA headquarters more clearly define for field offices what types of work are eligible for 3R funds and what types of work are maintenance and, as such, not eligible for federal funding.

AGENCY COMMENTS

On December 21, 1983, we provided the agency with a copy of our draft report for comment. Although requested to respond within 30 days, FHWA did not provide comments on the draft before we issued the final report.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 14 days from the date of the report. At that time we will send copies of the report to the Secretary of Transportation and the Administrator, Federal Highway Administration. Copies will also be available to other interested parties upon request.

Sincerely yours,



J. Dexter Peach
Director

C o n t e n t s

		<u>Page</u>
APPENDIX		
I	SCOPE AND METHODOLOGY	1
II	INTERSTATE PROJECTS BY TYPES OF IMPROVEMENTS	3
III	INTERSTATE 4R RESURFACING PROJECTS IN FIVE STATES	5
IV	DESCRIPTION OF GEORGIA'S FIVE INTER-STATE 4R RECONSTRUCTION PROJECTS	6
V	INTERSTATE 4R NONPRESERVATION PROJECTS IN SEVEN STATES	7
VI	NON-INTERSTATE PROJECTS BY TYPES OF IMPROVEMENTS	8
VII	NON-INTERSTATE 3R RESURFACING PROJECTS IN SIX STATES	9
VIII	NON-INTERSTATE 3R MINOR WIDENING PROJECTS IN FOUR STATES	10
IX	STATE PROJECT SELECTION PROCESS	11



SCOPE AND METHODOLOGY

We reviewed Interstate 4R and non-Interstate 3R projects in seven states--Colorado, Georgia, Illinois, Montana, New Jersey, New York, and Wisconsin. We did not determine whether the projects selected were the most "effective" of those considered. We used FHWA's computer listing of Interstate 4R projects authorized since 1976 for the seven States to identify a universe of projects authorized between October 1, 1980, and September 30, 1982. We did not review the accuracy of the computer systems used to generate this listing. From the universe of 186 projects, we selected a random sample for each state--a total of 113 projects to be included in our review. For two states, because the number of Interstate projects was low, we reviewed all of them. (App. II shows the numbers of and dollar amounts for the projects by type of improvement for the seven states.)

For non-Interstate 3R projects, we analyzed FHWA's Office of Engineering computer listing of 3R-type projects authorized between October 1, 1980, and June 30, 1982. For four states we used random numbers to select projects to review. Because the number of non-Interstate 3R projects authorized from October 1, 1980, to June 30, 1982, was low in three states, we reviewed all of the projects. We reviewed a total of 173 non-Interstate 3R projects out of a universe of 680 projects. (App. VI shows the numbers of and dollar amounts for the projects by type of improvement for the seven states.)

For our sample projects, we reviewed FHWA field office financial and project files. Financial files contained FHWA's form 37, which is a project status record showing total and federal funds obligated for the project and the type of work being done. We also reviewed project files for more detailed descriptions of the types of work being done. In those cases where the description of work in the two files did not agree, we had FHWA Geometric Design Branch officials determine the most appropriate classification. Thirteen projects were coded with a 3R-type improvement code in the financial files, but the detailed project description showed that the actual work was not 3R. Therefore, we dropped these projects from our sample. One additional project was dropped from the sample because the computer listing showed the project as having a 3R-type improvement; however, the actual work was new construction. Because we were not making projections from our sample, the 14 projects that were dropped were not replaced.

In each of the seven states we discussed with state officials the state's capability to meet the 1978 highway act requirement that 20 percent of a state's non-Interstate primary and secondary funds be for non-Interstate 3R work. We also discussed the state's capability to meet the new 40-percent requirement for non-Interstate 4R work.

We could not determine whether Interstate 4R projects in our sample resulted from deferred maintenance because maintenance records were not kept in a form in which we could develop maintenance histories for the roadway sections in our sample. However, we reviewed FHWA's annual maintenance inspection reports that were readily available in the seven field offices in the states we reviewed to determine whether FHWA had reported instances of deferred maintenance. Three field offices had reports for at least 4 years (1979-82), and the remaining four field offices had reports for 3 years or less.

During our work we interviewed FHWA's Director, Office of Engineering, and that office's Geometric Design Branch officials; Federal-Aid Division headquarters officials; FHWA field office officials; and state department of transportation officials.

With the exception of not verifying the accuracy of the computer system used to generate the project listings, we made our review in accordance with generally accepted government auditing standards.

INTERSTATE PROJECTS BY TYPES OF IMPROVEMENTS^a

Type of improvement	Colorado	Georgia	Illinois	Montana	New Jersey	New York	Wisconsin	Total ^b
Resurfacing								
No. projects	5	6	11	13	2	3	5	45
4R costs	\$3,915	\$9,888	\$17,525	\$21,865	\$5,466	\$4,622	\$5,907	\$69,187
Percent of state's 4R costs	33.1	28.7	86.2	94.4	44.2	45.2	65.4	57.0
Reconstruction								
No. projects		5	1				1	7
4R costs		\$23,655	\$575				\$876	\$25,105
Percent of state's 4R costs		68.7	2.8				9.7	20.7
Nonpreservation								
No. projects	7	5	4	1	5	5	2	29
4R costs	3,033	143	444	11	5,306	504	530	9,971
Percent of state's 4R costs	25.6	.4	2.2	.0	42.9	4.9	5.9	8.2
Bridge rehabilitation								
No. projects	1		2		1	11	2	17
4R costs	1,295		434		402	5,107	47	7,285
Percent of state's 4R costs	10.9		2.1		3.2	49.9	.5	6.0

^a4R costs are in thousands of dollars^bTotal may not add due to rounding.

INTERSTATE PROJECTS BY TYPES OF IMPROVEMENTS^a

<u>Type of improvement</u>	Colorado	Georgia	Illinois	Montana	New Jersey	New York	Wisconsin	Total ^b
<u>Miscellaneous</u>								
No. projects	2	3	2	2	1		5	15
4R costs	\$3,601	\$ 740	\$ 1,363	\$ 1,288	\$ 1,199		\$ 1,678	\$ 9,869
Percent of state's 4R costs	30.4	2.2	6.7	5.6	9.7		18.6	8.1
<u>Total^b</u>								
No. projects	15	19	20	16	9	19	15	113
4R costs	\$11,845	\$34,426	\$20,340	\$23,164	\$12,373	\$10,233	\$ 9,038	\$121,418
Percent of state's 4R costs	100	100	100	100	100	100	100	100

^a4R costs are in thousands of dollars.

^bTotal may not add due to rounding.

INTERSTATE 4R RESURFACING PROJECTS IN FIVE STATES

- Montana obligated \$21.9 million for 13 resurfacing projects. This represents 94.4 percent of the funds for the 16 projects reviewed. Project lengths ranged from 1.4 to 17.6 miles. Some of the projects included minor widening, signing, and recycling.¹
- Illinois obligated \$17.5 million for 11 resurfacing projects. This represents 86.2 percent of the funds for the 20 projects reviewed. The length of the projects ranged from 1.3 to 16 miles. The 16-mile resurfacing project included several intermittent sections of roadway. (Documents in FHWA project files did not indicate the length of each section.) In addition to resurfacing, seven of the projects included installing pipe underdrains to remove water from beneath the pavement.
- Wisconsin obligated \$5.9 million for five resurfacing projects. This represents 65.4 percent of the funds for the 15 projects reviewed. Project lengths ranged from 4.2 to 9.6 miles. Two projects included restoration and rehabilitation work such as base patching and joint sealing and recycling. The recycling project included shoulder reconstruction and bridge deck widening. Another project included lengthening exit and entrance ramps.
- New Jersey obligated \$5.5 million for two resurfacing projects. This represents 44.2 percent of the funds for the nine projects reviewed. One of the projects involved resurfacing 2.6 miles with spot shoulder reconstruction. The other project, which accounted for \$4.4 million of the \$5.5 million, involved removing deteriorated concrete slabs and recycling the concrete for resurfacing 19.9 miles. This project also included drainage and guardrail work.
- Colorado obligated \$3.9 million for five resurfacing projects. This represents 33.1 percent of the funds for the 15 projects reviewed. Project lengths ranged from 2.1 to 5.7 miles. Some of the resurfacing projects included incidental work such as installing or resetting guardrails.

¹Recycling is a process whereby the top layer of the pavement is removed, mixed with new concrete, and placed on the roadway.

DESCRIPTION OF GEORGIA'S FIVE INTERSTATE4R RECONSTRUCTION PROJECTS

- \$12 million was obligated to separate two Interstate routes' limited access facilities and add lanes, median barriers, retaining walls, and bridges along a common section of two Interstate routes.
- \$7 million was obligated to add lanes and widen bridges along a 17-mile section of the Interstate and reconstruct an interchange.
- \$2.3 million was obligated to add lanes, bridges, noise barriers, and walls along an Interstate route.
- \$1.9 million was obligated to reconstruct two interchanges, which included widening lanes, reconstructing ramps, landscaping, and installing a noise barrier.
- \$.5 million was obligated to widen 3.4 miles of the Interstate and add lanes and bridges.

INTERSTATE 4R NONPRESERVATIONPROJECTS IN SEVEN STATES

- New Jersey obligated \$5.3 million for five projects that included work such as upgrading and installing highway lighting and constructing a rest area.
- Colorado obligated \$3 million for seven projects that included work such as converting overhead sign lights, replacing bridge railings, resetting guardrails, flattening slopes, replacing utility poles, constructing bus ramps, expanding a park-and-ride facility, and installing a sound barrier fence.
- Wisconsin obligated \$530,000 for two projects for upgrading a railroad crossing and constructing a fringe parking lot.
- New York obligated \$504,000 for five projects that included work such as well drilling at comfort stations, installing epoxy pavement markings, constructing a bikeway, and installing signals and gas and camping logo signs at Interstate exits.
- Illinois obligated \$444,000 for four projects that included work such as installing a lighting system and traffic signs at a rest area, installing motorist signs, installing a bridge deck protective system, and constructing a sluice gate, which is a channel for conducting water.
- Georgia obligated \$143,000 for five projects that included work such as well drilling concrete and building work at truck weighing stations and installing pavement markers and highway signs.
- Montana obligated \$11,000 for the construction of a snow-fence that would provide snowdrift protection for an access lane which passes under the Interstate.

NON-INTERSTATE PROJECTS BY TYPES OF IMPROVEMENTS^a

Type of improvement	Colorado	Georgia	Illinois	Montana	New Jersey	New York	Wisconsin	Total ^b
<u>Resurfacing</u>								
No. projects	16	20	22	27	11	4	24	124
3R costs	\$ 8,382	\$ 4,136	\$ 3,536	\$17,822	\$10,397	\$ 4,961	\$11,115	\$ 60,349
Percent of state's 3R costs	77.8	75.9	49.0	94.0	45.4	21.3	85.6	59.4
<u>Minor widening</u>								
No. projects	4	2	4	1	6	4	1	22
3R costs	\$2,388	\$ 1,103	\$ 2,397	\$ 1,144	\$ 6,834	\$ 6,503	\$ 1,492	\$ 21,861
Percent of state's 3R costs	22.2	20.3	33.2	6.0	29.9	28.0	11.5	21.5
<u>Bridge rehab.</u>								
No. projects			1			13	1	15
3R costs			\$ 812			\$ 8,884	\$ 280	\$ 9,975
Percent of state's 3R costs			11.2			38.2	2.2	9.8
<u>Miscellaneous</u>								
No. projects		1	1		5	4	1	12
3R costs		\$ 206	\$ 472		\$ 5,652	\$ 2,912	\$ 102	\$ 9,344
Percent of state's 3R costs		3.8	6.5		24.7	12.5	.8	9.2
<u>Total^b</u>								
No. projects	20	23	28	28	22	25	27	173
3R costs	\$10,770	\$ 5,445	\$ 7,217	\$18,966	\$22,884	\$23,259	\$12,989	\$101,530
Percent of state's 3R costs	100	100	100	100	100	100	100	100

^a3R costs are in thousands of dollars.

^bTotal may not add due to rounding.

NON-INTERSTATE 3R RESURFACINGPROJECTS IN SIX STATES

- Montana obligated \$17.8 million for 27 resurfacing projects. This represents 94 percent of the funds for 28 projects reviewed. Project lengths ranged from .8 miles to 16.9 miles. Four of the projects included shoulder widening and two, pavement widening.
- Wisconsin obligated \$11.1 million for 24 resurfacing projects. This represents 85.6 percent of the funds for 27 projects reviewed. Project lengths ranged from .2 miles to 14 miles. Ten of the projects included recycling. Eight projects included pavement and shoulder widening.
- New Jersey obligated \$10.4 million for 11 resurfacing projects. This represents 45.4 percent of the funds for 22 projects reviewed. Project lengths ranged from 1.5 to 8.7 miles. One project included intermittent sections ranging from .3 miles to 1.4 miles on five streets. Additional work in four of these projects included grading, drainage, widening and lengthening an auxiliary lane, guardrail work, and signing.
- Colorado obligated \$8.4 million for 16 resurfacing projects. This represents 77.8 percent of the funds for 20 projects reviewed. Project lengths ranged from .4 miles to 9.1 miles. Seven of the 16 projects included shoulder work, most frequently shoulder widening.
- Georgia obligated \$4.1 million for 20 resurfacing projects. This represents 75.9 percent of the funds for 23 projects reviewed. The resurfacing projects ranged from .6 miles to 18.8 miles. Some of the resurfacing projects included utility adjustments, consisting of changing water valve or manhole locations.
- Illinois obligated \$3.5 million for 22 resurfacing projects. This represents 49 percent of the funds for 28 projects reviewed. Project lengths ranged from .1 to 9.3 miles. Several of these projects included several intermittent sections of roadway. (Documents in FHWA project files did not indicate the length of each section.) Some of the nonintermittent projects included shoulder upgrading or drainage improvements.

NON-INTERSTATE 3R MINOR WIDENINGPROJECTS IN FOUR STATES

--New Jersey obligated \$6.8 million for six minor widening projects. This represents 29.9 percent of the funds for 22 projects reviewed. Three projects involved widening of 2 feet with resurfacing. Two projects involved widening of 8 feet with additional work in one project of constructing a curb and sidewalks and in another project, drainage work. The other project involved widening of 6 feet with intersection improvements.

--New York obligated \$6.5 million for four minor widening projects. This represents 28 percent of the funds for 25 projects reviewed. One project consisted of resurfacing, replacing culverts, and widening one pavement section by 2 feet and shoulders by 1 foot and another pavement section by 4 feet and shoulders by 2 feet. A second project involved widening of 2-4 feet and shoulder reconstruction and drainage improvements. A third project involved widening 16 feet, providing a left turn lane, installing a drainage system, and upgrading signs. The fourth project involved adding two 8-foot parking lanes and sidewalks.

--Illinois obligated \$2.4 million for four minor widening projects. This represents 33.2 percent of the funds for 28 projects reviewed. The four projects included resurfacing: two involved 2-foot widening and the others involved 4-foot widening. Three of the four projects included shoulder upgrading.

--Colorado obligated \$2.4 million for four minor widening projects. This represents 22.2 percent of the funds for 20 projects reviewed. Three of the projects involved 1-foot widening and resurfacing and two of these projects involved shoulder widening. One project involved adding a lane and constructing a curb gutter and a small bus pull-out facility.

STATE PROJECT SELECTION PROCESS^a

<u>State</u>	<u>Needs identification</u>	<u>Project selection</u>
Colorado ^b	The central office identifies statewide needs using highway condition ratings.	Within each district, projects within each work type (resurfacing, reconstruction, minor widening, etc.) will be ranked based on a formula using data on a pavement's condition, skid resistance, structural condition, hazard index, traffic volume and capacity. Central office ranks projects and districts select projects from the list.
Georgia	The central office sends a letter requesting identification of needs for roads to districts to distribute to area engineers. Area engineers identify work on the basis of judgment and knowledge of the roads. A central office liaison engineer identifies Interstate resurfacing projects by visually inspecting the entire Interstate System in the state.	District and central offices rate roadway condition through a series of visual inspections. The central office makes project selections statewide based on these roadway condition ratings and engineering judgment.

^aThe selection processes described in this appendix relate primarily to Interstate 4R and primary 3R projects. Georgia did not use the same needs identification process for Interstate 4R and primary 3R projects. Wisconsin did not use the same selection process for Interstate 4R and primary 3R. Any differences are noted accordingly.

^bColorado's and Montana's systems are being implemented and are subject to modification.

<u>State</u>	<u>Needs identification</u>	<u>Project selection</u>
Illinois	Every 2 years district engineers visually inspect highway conditions. Projects are proposed based on highway condition ratings.	District engineers assign priority using highway condition ratings and traffic data. Each district submits a list of ranked projects to the central office. The central office reviews and adjusts priorities from a statewide perspective by type of work (resurfacing, reconstruction). The central office prepares a program and sends the district the list of projects included in the program.
Montana ^b	A central office review team screens initial proposed projects that were submitted by the central office, districts, counties, or other local government entities.	The central office uses a cost-effectiveness index to rank projects statewide. The index rates each project using sufficiency ratings, traffic volume, number of years the improvement will last, and cost. District offices review preliminary lists and recommend changes.

^bColorado's and Montana's systems are being implemented and are subject to modification.

<u>State</u>	<u>Needs identification</u>	<u>Project selection</u>
New Jersey	The central office identifies projects from plans and highway condition ratings, accident data, skid reports, and other information.	The central office evaluates and ranks projects costing over \$1 million on the basis of a composite rating of engineering need and environmental, energy, air quality, and urban impact. Projects less than \$1 million are ranked primarily on road condition. Central office selects projects on the basis of rankings.
New York	District engineers, in conjunction with metropolitan planning organizations and local governments, identify needed work using highway condition ratings, capacity, and safety information.	Project selection varies by district. In the two districts we visited, district maintenance, design, traffic, and construction engineers discuss and rank projects on the basis of highway pavement and structural condition, capacity, and safety data provided by the central office. The ranked projects are sent to the central office for review and approval. The central office does not compare needs statewide. Projects are listed on the statewide annual transportation program, and the district selects projects from the program.

<u>State</u>	<u>Needs identification</u>	<u>Project selection</u>
Wisconsin	Districts identify projects using highway condition ratings and engineering judgment. The central office sets a minimum mileage requirement for road resurfacing and related improvements. A state steering committee identifies needed work on the Interstate on the basis of pavement condition.	Districts select projects within dollar and mileage parameters set by the central office. A state steering committee ranks Interstate projects on the basis of road condition. Interstate segments receive a priority ranking and are scheduled for work accordingly.

(342751)

27745

AN EQUAL OPPORTUNITY EMPLOYER

**UNITED STATES
GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548**

**OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300**

**POSTAGE AND FEES PAID
U. S. GENERAL ACCOUNTING OFFICE**



THIRD CLASS

AE