ARIZONA DEPARTMENT OF TRANSPORTATION

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POTENTIAL IMPACTS OF LIMITING FEDERAL-AID HIGHWAY PROGRAM TO ROUTES OF INTERSTATE SIGNIFICANCE

Final Report

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16. Abstract

This report evaluates the impacts of shifting federal-aid highway funds to state and local governments, and assigning jurisdictional responsibility for routes of interstate significance to the Federal Government. The analysis is based on highway expenditure data from 1981 through 1985 for Arizona, North Carolina, Pennsylvania, and Washington. Seven highway redistribution scenarios were evaluated, and the legal implications of altering the current system of responsibility and finance were discussed.

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1. INTRODUCTION

PROBLEM STATEMENT

Under the current system of obligation for the development, operation, and maintenance of our nations' highways the federal, state, and local governments both share control and assume unique responsibilities. The Federal Government provides for a large percentage of the cost of highway development through various federal-aid programs. Highway administration operations and maintenance expenditures are primarily the responsibility of the state and local governments in addition to capital development expenses associated with non-federal-aid highways.

There has been a growing concern that the existing funding mechanisms are not adequate to support the current and future needs for highway financing. This has resulted in some discussion of the potential for an evolution in the current federal-state relationship which has produced the financing mechanisms and responsibilities that exist today. State and local governments may have to assume greater responsibility for financing and decision making for their transportation systems.

It has been suggested that a more beneficial use of federal funds could be achieved by focusing federal-aid programs on routes and responsibilities of truly national significance. This could redirect roadway responsibilities among the levels of government. For example, the Federal Government might focus its responsibilities on the development, operation, and maintenance of a designated highway system. Other systems would be the total responsibility of the state and local governments. Limiting federal assistance to the designated system would leave states and local governments with greater autonomy over the remaining system, but it would also result in a shift in the financial burden of roadway development and upkeep. Greater efficiency in the administration and use of funds might be offset by financial hardship at the state and local level.

GOALS AND OBJECTIVES

The purpose of this study was to investigate the impacts of a realignment of jurisdictional responsibility of the highway system at the federal, state and local

levels. The primary goal of the study was to evaluate the financial impacts of realignment through various hypothetical realignment scenarios. These scenarios were designed to reflect realignment potentials based on the significance of various types of roadways to interstate transport. A secondary objective of this study was to evaluate the legal, organizational, and other institutional factors affecting the realignment of roadway responsibility within the State of Arizona from a state and federal perspective.

To satisfy the objectives of this study it was necessary to develop a procedure whereby the financial impacts of realignment could be evaluated. The procedure consisted of a computerized spreadsheet containing federal, state, and local highway expenditures stratified by roadway functional class and expenditure category. The highway jurisdiction was redistributed based on several general scenarios of responsibility, and the highway expenditures for each level of government were redefined. These scenarios were compared to the existing condition in order to evaluate the financial impacts associated with redistribution. The analysis was based on a five year history of highway expenditures from 1981 through 1985.

TECHNICAL SUMMARY

The analysis procedure consisted of seven basic phases:

- Selection of a roadway classification scheme
- Collection of highway expenditure data
- State selection
- Estimation of missing data
- Development of spreadsheet for data analysis
- Evaluation of redistribution scenarios
- Analysis of legal requirements

Roadway Classification

Several roadway classification schemes were evaluated for potential use in this study. These included administrative, functional, and other roadway classification schemes. The functional classification scheme was selected for this study based on its common use among states and the availability of roadway

expenditure data keyed to roadway functional class. Functional classification is the process by which streets and highways are grouped according to the character of service they are intended to provide.

Expenditure Data

The primary sources of data for this study were the Federal Highway Administration (FHWA), and the Arizona Department of Transportation (ADOT). The FHWA supplied data for North Carolina, Pennsylvania, and Washington for state and local highway expenditures by roadway functional class. The ADOT supplied the data for the State of Arizona.

State Selection

Three states were selected to be included in the analysis along with Arizona. These states are North Carolina, Pennsylvania and Washington. The additional states were selected based on the availability and reliability of state and local roadway expenditure data. The relationship of the state as a donor or donee with respect to the federal highway user revenue fund was also used as a selection criteria.

Missing Data Estimation

More than 80 percent of the individual data items required for this analysis were available from either published sources or state records. The missing state and local expenditure data were estimated based on existing data using linear interpolation and other estimation procedures.

Spreadsheet Analysis

Data were compiled into a computerized spreadsheet. Federal, state, and local highway expenditures were aggregated for the five year study period (1981 through 1985) for each state by each of six rural and six urban roadway functional classes. The spreadsheet was programmed such that the expenditures for entire functional classes, or portions thereof, could be shifted among the three levels of government, simulating the financial impact of changes in jurisdictional

responsibility. This facilitated the generation of summary reports describing financial obligation under a variety of hypothetical scenarios of jurisdictional responsibility.

Redistribution Scenarios

The primary basis for the definition of the redistribution scenarios was the concept that some federal-aid programs would be shifted and that the Federal Government would take over complete responsibility (design, construction, and maintenance) for a highway system designated as having interstate significance. The "federal routes of interstate significance system" varied over several scenarios to include 100 percent of the interstate system, plus portions of the rural principal arterial system and the urban freeway system. Seven scenarios were defined in addition to the existing conditions. A perspective on the shifts in the financial burden between federal, state, and local governments was assessed based on the 1981 through 1985 expenditure data.

Analysis of Results

The impact of the redistribution scenarios on individual states is primarily related to the existing funding relationship between the federal, state, and local governments. Among the four states studied, the largest local percentage of total roadway expenditures was in Arizona. A major factor in establishing the local share of total expenditures is the amount of state revenues passed back to the local jurisidictions. ADOT currently returns 50 percent of state highway revenues to local governments (highest among all states studied), and these funds were considered local expenditures. State plus local expenditures in Arizona were estimated to account for 78.5 percent of total roadway expenditures under the existing conditions of responsibility.

Limiting federal-aid to the interstate system shifts a substantial burden of highway finance to the state and local governments for all states studied, while the percent participation of the Federal Government declines. In Arizona, the state plus local share increased from 78.5 percent to 84.0 percent of total expenditures.

The federal share is increased to approximately the existing conditions for Arizona and Pennsylvania under the scenario where the entire interstate and rural

principal arterial system become federal responsibility. Under this scenario the federal share of expenditures for North Carolina and Washington would still be 4 and 10 percentage points below the respective existing conditions.

The scenario where the entire interstate, rural principal arterial, and urban freeway systems become federal responsibility results in the greatest number of roadway miles being transferred. In Arizona, this scenario results in 25.2 percent federal share of expenditures. This is, however, the lowest federal share for any of the states studied.

Legal Requirements

A review was made of the federal and Arizona state laws on which current highway financing programs are based in order to determine legal changes required to implement funding redistribution scenarios.

Changes in the funding apportionment formulas and the definitions of the roadways which comprise the federal-aid system would require changes to Title 23 of the United States Code. Another legal issue is the potential conflict between the funding authorizations currently approved by Congress through 1991, and the redistribution of funding hypothesized in this report. Also, funds authorized by Congress can be subject to limitations on obligation per the Congressional Budget and the Impoundment Control Act of 1974. While the limitations do not reduce apportionments to the states, they do restrict the total obligations that can be incurred in a given year. It is not clear as to whether this Act would require revisions if a funding redistribution was instituted.

On a state level, all of the state funding sources and distributions are defined by statute. Changes in the funding levels required by the state to construct and maintain highway projects may require changes to the state funding sources and distribution. The Arizona Revised Statutes also define federal and state responsibilities for designated roadway.

To change the level of local funding required for transportation improvements would require changing the Arizona Revised Statutes and would require local action on the part of the county board of supervisors or city or municipal governments if tax changes are required.

2. ANALYSIS PROCEDURE

ROADWAY CLASSIFICATION

A prime requirement of this study was the identification of a roadway classification scheme which had the following characteristics:

- Common usage by all of the states in the study.
- Roadway expenditure data had to be commonly associated with each roadway class by all states in the study.
- The classification scheme had to have a meaningful relationship to the concept of roadways having interstate significance. That is, the idea that a class, or a portion of a class, of roadways were designated as having interstate significance had to be meaningful and realistic in terms of the types of travel served by the roadway.

Several classification schemes were identified and reviewed for use in this study. These included:

- Design Type - Classification would be based on major geometric design features, e.g., limited access versus conventional roadways, multilane versus two-lane. This is typically used for location and design procedures.
- Route Numbering System Classification - This is the typical numbering system used throughout the nation on U.S., state and county roadways.
- Core and Supplemental Routes - Arizona has established and implemented criteria for eligibility in the state highway system. Routes which are identified as clearly satisfying state-level criteria have been designated as core routes. All other routes on the state highway system have been designated as supplemental.
- Administrative Classification - This scheme is used to indicate the current level of government responsibility. In Arizona, the major subdivisions are state and local--including cities, counties and Indian reservations. This system is also used to designate government funding responsibility, e.g., Federal-Aid Primary or Federal-Aid Secondary roadways.
- Functional Classification - This is the grouping of highways by the character of service they provide, e.g., rural principal arterials which "serve corridor movement having trip length and travel density characteristics indicative of substantial statewide or interstate travel... and serve all, or virtually all urban areas of 50,000 and over population and a large majority of those with a population of 25,000 and over." (FHWA, 1974, pg. II-9).

Of these, and other classification schemes identified, only two were selected as potentially satisfying the study requirements--Administrative Classification and Functional Classification. The Functional Classification scheme was deemed to satisfy more effectively the application criteria, particularly with respect to the availability of expenditure data and the classification relationship to the concept of roadways having interstate significance. The definitions of the functional classifications are contained in Appendix B.

Although the Administrative Classification scheme is commonly used throughout the country, its application is not clearly tied to roadways that could be considered of interstate significance. For example, not all Federal-Aid Primary or Federal-Aid Secondary roadways could be considered of interstate significance. Furthermore, published records of expenditures by Administrative Classification do not distinguish between state and local roadways in the Federal-Aid Primary and Federal-Aid Secondary systems.

EXPENDITURE DATA

Functional Class Collector or Higher

The primary source for state and local expenditure data was the FHWA. The FHWA requires that each state submit annual roadway expenditure data that is disaggregated by roadway functional class. Local jurisdiction expenditures are required on a biannual basis. These statistics are summarized in the annual FHWA publication Highway Statistics. A sample of the reporting form used for this process, commonly referred to as the FHWA Form 534, is shown in Figure 2-1. Expenditures for roadways having a functional class of collector or higher are reported on FHWA Form 534. Figure 2-2 contains the codes used on FHWA Form 534 indicating the government agency, area type and roadway functional class. State and local data for North Carolina, Pennsylvania, and Washington were received directly from FHWA by copies of FHWA 534 forms submitted by each state.

Three area types are used on FHWA Form 534--rural, small urban (5,000 to 49,999 population) and urbanized (population of 50,000 or more). Within both the

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Exp. 11-87

US Department of Transportation
Federal Highway Administration

HIGHWAY CAPITAL OUTLAY AND MAINTENANCE EXPENDITURES

(Classified by Functional and Federal-aid System)
In Dollars

FILE CODE	1 4	1 2 3
STATE		4 5
CALENDAR YEAR		6 7
SYSTEM CLASSIFICATION		8 9 10

IMPROVEMENTS GROUPED 11	LINE NO. 15-16	CAPITAL OUTLAY	FEDERAL-AID SYSTEM: FEDERAL-AID PROJECT 17-26	FEDERAL-AID SYSTEM: NON-FEDERAL-AID PROJECT 27-36	NON-FEDERAL-AID SYSTEM 37-46	TOTAL 47-56
	00	RIGHT-OF-WAY COSTS				
	00	ENGINEERING COSTS				
		CONSTRUCTION BY IMPROVEMENT TYPE				
	01	NEW CONSTRUCTION				
	02	RELOCATION				
	03	RECONSTRUCTION				
	04	MAJOR WIDENING				
	05	MINOR WIDENING				
	06	RESTORATION AND REHABILITATION				
	07	RESURFACING				
	08	NEW BRIDGE				
	09	BRIDGE REPLACEMENT				
	10	MAJOR BRIDGE REHABILITATION				
	11	MINOR BRIDGE REHABILITATION				
	12	SAFETY/TRAFFIC OPERATIONS/TSM				
	13	ENVIRONMENTALLY RELATED				
	14	TOTAL CAPITAL OUTLAY (Lines 00 to 13)				
		MAINTENANCE COSTS				TOTAL
	15	PHYSICAL MAINTENANCE		(optional)	(optional)	
	17	TRAFFIC SERVICES		(optional)	(optional)	
	22	TOTAL MAINTENANCE COSTS		(optional)	(optional)	

FORM FHWA-534
(Rev. 4-85)

PREVIOUS EDITIONS OBSOLETE.

FIGURE 2-1. FEDERAL HIGHWAY ADMINISTRATION FORM 534

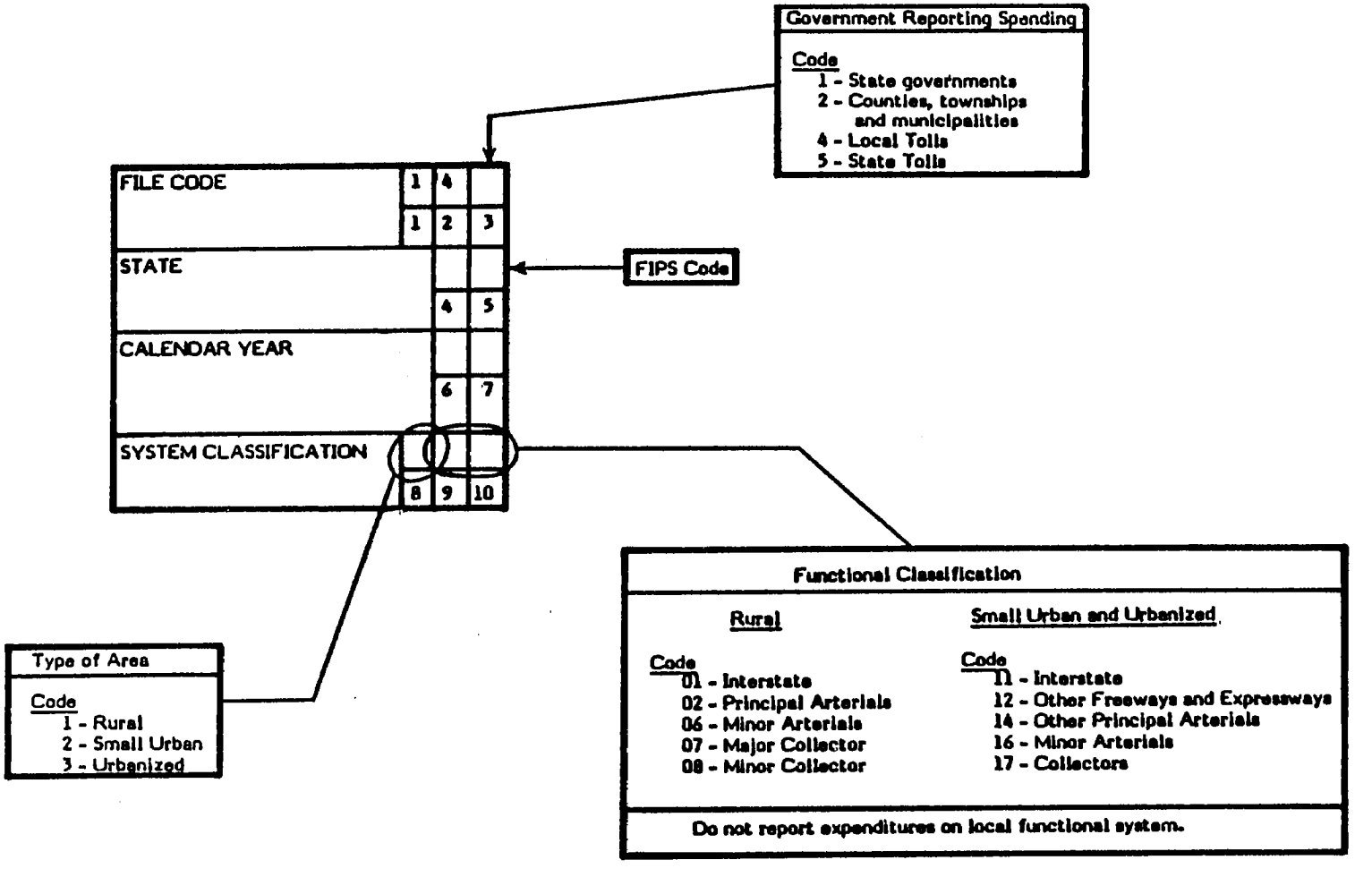

FIGURE 2-2. FHWA FORM 534 IDENTIFICATION CODES

urban and rural area types there are six roadway functional classes shown in Table 2-1. The roadway functional classifications for small urban and urbanized areas are the same, and hence these were combined into the single urban category for use in this study.

TABLE 2-1. HIGHWAY FUNCTIONAL CLASSIFICATIONS

Rural	Urban
Interstate	Interstate
Other Principal Arterial	Other Freeway and Expressway
Minor Arterial	Other Principal Arterial
Major Collector	Minor Arterial
Minor Collector	Collector
Local	Local

Discussions with ADOT personnel indicated that there was considerable skepticism regarding the accuracy of the Arizona FHWA Form 534 data. The total state expenditures were considered accurate, however the disaggregation of the total by functional class for Arizona was not based on actual expenditures. Expenditures by functional class for Arizona have been based on a percent of total expenditures developed by the state from historical data. Data for the state expenditures is not routinely aggregated by roadway functional class.

An updated version of the FHWA Form 534 data was obtained from Arizona records for 1985 state data. Similar updates were not available for the other study years and this data was taken directly from FHWA 534 forms submitted to FHWA. Local jurisdiction expenditure data for Arizona was obtained directly from state records. A sample of the form used to report local expenditures in Arizona is shown in Figure 2-3.

Table 2-2 indicates the sources of the data obtained for this study. Table 2-3 summarizes the data obtained and indicates the missing data that required estimation. The procedures used to estimate the missing data are discussed later in this report.

76-F-32 R12/83

ARIZONA DEPARTMENT OF TRANSPORTATION
TRAVEL AND FACILITIES

LOCAL GOVERNMENT ROAD AND STREET FINANCE REPORT

COUNTY/CITY Phoenix

YEAR ENDED June 30, 1986

I. RECEIPTS FOR ROAD AND STREET PURPOSES	
ITEM	AMOUNT
A. Receipts from Local Sources	
1. Property taxes and special assessments	2,645,008
2. General fund appropriations	27,637,383
3. Parking funds	—
4. Income on investments	4,101,138
5. Contributions by Subdivisions	12,967,844
6. Sales Receipts	—
7. Traffic fines	6,702,205
8. Other (specify) PARTICIPATION FROM DEVELOPERS, PROPERTY OWNERS, ETC.	3,526,131
Total I.A.	57,579,709
B. Receipts from State Government	
1. Highway user taxes [ ] Fiscal Basis [X] Accrual Basis	64,774,644
2. Lottery Funds	8,445,150
3. Other (specify)	—
Total I.B.	73,219,794
C. Receipts from Federal Government (Include Federal Aid Highway Funds Received Directly)	
1. Forest Service fees	—
2. Other (specify) CDP, FRS, GRANTS	2,011,160
3. Other (specify) FLOOD	80,719
Total I.C.	2,091,879
D. Sales of Bonds and Notes	
1. Bonds	18,666,266
2. Notes a) RECOVERIES OF PY Exp b) STORM DRAIN BONDS	3,430,173 21,481,407
Total I.D.	43,577,846
E. Total Receipts	176,469,228

II. DISBURSEMENTS FOR ROAD AND STREET PURPOSES	
ITEM	AMOUNT
A. Direct Disbursements	
1. Capital outlay for construction	
a. Right of way (Item 01)	28,219,186
b. Regular Engineering (Item 02)	11,706,069
c. Construction (Items 03 to 13)	48,028,469
Total Item II.A.1. (Item 14)	87,953,724
2. Maintenance	
a. Maintenance of Condition (Item 15)	10,383,333
b. Snow and Ice Removal	—
c. Traffic Services (Item 18)	7,908,823
Total II.A.2 (Item 20)	18,292,156
3. General Administration and Engineering	5,723,480
4. Highway and/or Traffic Police	6,702,205
5. Payments to State F A S (ADOT deposits)	377,478
Total II.A. 1. to 5.	119,049,043
B. Payments on local obligations	
1. Bond interest	14,816,430
2. Bond redemption	8,607,164
3. Note interest	—
4. Note redemption	—
Total II.B.	23,423,594
D. Transfers for Non Road and Street Purposes	31,575,971
E. Total Disbursements	174,048,608

III. Changes in Local Debt Status	BONDS	NOTES
A. Opening Debt	132,803,956	
B. Issues		
1. Original (+)	18,666,266	
2. Refunding (-)	(148,825,000)	(REFUNDED DEBT)
C. Redemptions		
1. Current (-)	(1,877,164)	
2. Refunding (+)	158,130,000	(REFUNDING)
D. Closing Debt	158,898,058	

FIGURE 2-3. SAMPLE OF LOCAL JURISDICTION EXPENDITURE REPORTING IN ARIZONA

TABLE 2-2. DATA SOURCES FOR ROUTES OF INTERSTATE SIGNIFICANCE

State(s)	Jurisdiction	Source	Form
Arizona	State	ADOT	Federal Form 534
	Local (all Functional Classes)	ADOT	Arizona Form 76-4101
Pennsylvania, North Carolina, and Washington	State	FHWA	Federal Form 534
	Local (all Functional Classes combined total)	FHWA/ Highway Statistics	Federal Form 536 as reported in Highway Statistics
	Local (Functional Classes collector and above)	FHWA	Federal Form 534

TABLE 2-3. MATRIX OF AVAILABLE EXPENDITURE DATA

State	Form 534	1981	1982	1983	1984	1985
Arizona	State	N/A	X	X	X	X
	Local[a]	Y	Y	Y	Y	Y
North Carolina	State	X	X	X	X	X
	Local	X	X	X	N/A	N/A
Washington	State	X	X	X	X	X
	Local	X	X	X	X	N/A
Pennsylvania	State	X	N/A	X	X	X
	Local	N/A	X	X	X	X

(a) Arizona local jurisdiction data obtained from ADOT records
X = Available
Y = Partially available, required some estimation
N/A = Not available, required estimation

The data contained on FHWA Form 534 includes total expenditures for all roadways classified as collector or higher. Three project funding categories exist--federal-aid system (FAS) projects include both federal-aid projects (FAP) and non-federal-aid projects (NFAP), and there are non-federal-aid system projects (NFASP). FAP money includes primarily federal funds plus state or local matching money. The NFAP funds are purely state or local monies. The NFASP funds are primarily state or local money but could include some very minor federal dollars. The proportion of federal funds in the NFASP expenditures could not be determined, and hence this data was assumed to represent all state or local funding. This was not considered to significantly bias the results of this study.

Local Expenditures on Local Roads

Local jurisdiction expenditures on local roads were determined using data reported on the FHWA Form 536 which is summarized directly in the Highway Statistics publication. This data contains total reported expenditures for all roadway classes by local jurisdictions as illustrated in Tables 2-4 and 2-5. The local expenditures reported on FHWA Form 534 were subtracted from the total expenditures illustrated in Tables 2-4 and 2-5 for each year of the study period. The result was taken as the local expenditures on roadways with a local functional class.

Accounting by Jurisdiction and Functional Class

To determine an accounting procedure whereby federal, state, and local expenditures could be estimated by functional class remained. The accounting procedure was required to reflect federal, state, and local participation in highway finance under the existing conditions of responsibility and under the hypothetical conditions created by the redistribution scenarios. Federal participation by roadway class was defined as those expenditures indicated on FHWA Form 534 for federal-aid projects, multiplied by the federal participation ratios for the different project types. The federal funding percentages are shown in Table 2-6.

TABLE 2-4. DISBURSEMENTS BY MUNICIPALITIES FOR HIGHWAYS - 1984

COMPILED FROM REPORTS OF STATE AND LOCAL GOVERNMENTS

(THOUSANDS OF DOLLARS)

TABLE UF-2
SEPTEMBER 1986

STATE	CAPITAL OUTLAY				MAINTENANCE			TRAFFIC POLICE 1/	ADMINISTRATION AND MISCELLANEOUS	INTEREST 2/	SUBTOTAL CURRENT DISBURSEMENTS	DEBT RETIREMENT 2/	TRANSFERS TO		NON-HIGHWAY	TOTAL
	RIGHT-OF-WAY 2/	ENGINEERING 3/	CONSTRUCTION	TOTAL	ROADS AND BRIDGES	SNOW REMOVAL	TOTAL						STATE GOVERNMENTS	LOCAL GOVERNMENTS		
ALABAMA	400	2,766	42,510	45,676	86,386	-	86,386	1,022	2,710	13,448	150,242	67,775	102	-	-	218,159
ALASKA	171	8,749	65,747	74,667	15,337	9,243	30,580	11,454	8,007	7,117	119,628	4,550	-	-	-	124,184
ARIZONA 4/	3,588	9,234	100,641	109,463	31,608	1,550	33,398	32,107	9,350	12,302	266,630	9,512	2,782	-	-	279,124
ARKANSAS 4/	207	1,873	15,688	17,768	41,964	-	41,964	2,567	5,065	696	68,087	12	561	-	-	68,630
CALIFORNIA	24,589	28,926	379,124	432,249	545,020	455	545,475	194,183	98,455	19,537	1,290,105	35,574	56,139	1,366	-	1,373,188
COLORADO	2,709	9,195	73,313	85,217	52,605	23,236	75,921	36,473	10,155	11,070	218,840	26,414	11,212	478	-	256,954
CONNECTICUT 4/	-	252	5,931	6,183	98,481	10,942	109,423	2,212	10,029	1,723	129,070	512	-	-	-	129,582
DELAWARE 4/	-	16	200	216	5,219	542	5,761	4,322	245	1,230	11,774	1,440	-	-	-	13,214
FLORIDA 4/	1,117	4,635	61,572	67,328	103,358	-	103,358	98,861	3,422	6,320	359,306	1,917	7,728	-	-	368,948
GEORGIA	49	1,422	22,050	23,529	64,618	-	64,618	18,918	7,581	1,492	116,138	2,791	-	-	-	118,928
HAWAII 2/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IDAHO	87	204	2,915	3,177	11,713	779	12,492	665	3,093	167	19,864	396	-	65	-	20,025
ILLINOIS 4/	1,776	12,134	68,903	82,495	230,730	13,639	244,369	64,636	31,028	8,808	432,136	2,154	9,905	-	-	444,315
INDIANA	1,300	4,322	43,339	48,962	61,737	4,624	66,361	58,794	8,828	4,497	147,442	2,440	3,914	-	-	153,796
IOWA	1,769	5,682	63,670	71,121	67,422	8,721	76,143	12,990	8,195	19,810	187,867	32,249	1,667	-	-	221,783
KANSAS 4/	-	3,112	32,571	35,683	48,758	245	49,003	10,795	1,651	13,388	110,717	5,421	6,477	-	-	122,615
KENTUCKY 4/	6	1,264	12,775	14,045	22,942	905	23,847	31,928	2,552	524	63,896	137	1,078	19	-	64,130
LOUISIANA	46	14,094	122,379	136,519	79,294	-	79,294	42,975	10,160	25,077	293,026	12,872	-	-	-	312,698
MAINE	-	967	11,417	12,384	17,469	15,244	32,733	2,442	3,824	1,802	52,307	2,548	783	-	-	55,638
MARYLAND 4/	5,401	15,398	159,696	176,495	55,316	3,062	58,378	6,985	7,373	7,905	257,107	476	-	-	293	257,876
MASSACHUSETTS	593	2,521	17,777	20,891	102,285	30,834	133,119	45,436	37,164	1,302	237,913	14,802	537	65	-	243,397
MICHIGAN 4/	-	7,280	69,310	76,590	117,882	13,331	131,213	109,260	11,680	4,050	332,193	3,021	3,966	1,630	-	340,812
MINNESOTA	-	9,723	167,377	177,100	117,013	16,244	133,257	41,929	24,321	31,745	408,350	62,450	3,153	-	-	473,953
MISSISSIPPI 4/	410	1,818	16,196	18,424	41,849	-	41,849	1,752	591	5,079	67,695	475	3,449	-	-	71,619
MISSOURI 4/	228	1,637	35,977	37,892	100,597	1,076	101,773	1,061	2,477	4,339	147,562	2,765	4,240	-	-	154,567
MONTANA	102	324	1,015	1,463	7,802	87	7,969	2,550	652	484	12,959	8,284	-	-	-	20,295
NEBRASKA	46	4,553	50,900	55,498	32,514	4,472	36,986	9,783	7,170	13,338	124,075	24,015	8,789	21	-	152,871
NEVADA 4/	-	1,388	14,007	15,392	9,566	-	9,566	3,592	1,590	317	30,414	10	-	-	-	30,424
NEW HAMPSHIRE 4/	-	420	6,077	6,497	8,486	8,320	16,806	2,920	2,072	728	29,403	9,638	2,710	-	-	41,751
NEW JERSEY 4/	-	8,327	110,640	118,967	154,136	54,401	208,539	42,498	35,121	10,245	406,368	91,307	-	-	-	497,667
NEW MEXICO 4/	-	892	8,482	9,374	13,234	-	13,234	7,647	3,535	1,364	35,099	573	-	-	-	35,672
NEW YORK 4/	-	24,059	294,352	318,411	422,671	67,891	490,562	82,739	82,066	87,003	1,060,481	165,865	-	196	237,550	1,464,062
NORTH CAROLINA	2,997	4,696	27,933	35,626	57,309	664	57,973	41,099	13,639	3,414	151,753	6,691	5,963	-	-	164,407
NORTH DAKOTA 4/	600	2,580	21,598	24,858	10,144	1,511	11,655	3,223	540	9,092	49,370	1,094	3,480	1,256	-	54,200
OHIO 4/	260	5,362	91,786	101,408	187,206	11,660	198,866	65,334	21,061	35,963	418,633	35,866	17,707	-	-	526,226
OKLAHOMA 4/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OREGON	1,416	4,487	22,845	28,748	31,379	821	32,200	16,055	10,483	5,515	93,301	21,177	2,344	1	-	116,823
PENNSYLVANIA	-	3,471	35,091	38,562	141,287	13,817	155,104	207,565	44,135	6,675	452,445	22,423	6,242	-	-	481,120
RHODE ISLAND	1	648	6,554	7,203	7,558	3,276	10,834	5,100	2,215	899	26,251	438	-	-	-	26,689
SOUTH CAROLINA 4/	67	704	2,429	3,702	9,235	36	9,271	18,810	1,661	293	32,737	280	357	-	-	33,374
SOUTH DAKOTA	-	690	8,532	9,222	12,391	1,158	13,549	11,010	2,610	1,264	37,831	2,170	-	-	-	40,001
TENNESSEE	-	2,136	28,383	30,519	58,711	2,446	61,157	11,891	4,886	5,047	114,300	11,072	3,010	-	-	128,382
TEXAS	16,626	47,135	249,442	313,203	262,368	-	262,368	362,316	43,485	113,535	1,093,907	88,964	10,881	289	4,353	1,198,354
UTAH	152	3,189	11,130	14,471	20,196	2,918	23,114	782	4,161	-	42,526	-	1,850	261	-	45,047
VERMONT 4/	-	127	2,030	2,157	6,903	1,372	7,875	36	826	25	10,621	330	-	-	-	10,951
VIRGINIA 4/	450	3,637	36,773	40,860	69,030	2,590	71,620	32,600	14,499	15,178	174,987	12,555	7,031	-	-	195,543
WASHINGTON	8,414	31,910	94,028	130,952	87,464	1,627	89,091	28,296	16,285	7,600	262,196	15,716	1,298	-	-	260,210
WEST VIRGINIA	65	788	8,165	9,018	30,056	237	30,292	4,529	1,962	462	46,274	339	793	-	-	47,406
WISCONSIN	-	21,647	98,734	120,381	100,741	11,193	111,934	187,316	24,621	29,043	473,295	41,871	7,887	-	-	522,454
WYOMING	426	2,582	20,864	23,872	10,485	2,017	12,502	8,812	7,106	410	52,703	8,391	1,582	-	-	60,676
TOTAL	73,170	322,263	2,918,179	3,313,612	3,921,933	342,901	4,264,834	1,934,790	634,659	541,508	10,689,395	908,429	182,816	5,627	242,196	12,028,163

1/ THIS TABLE RECORDS THE DISBURSEMENTS FOR ROAD AND STREET PURPOSES BY MUNICIPALITIES INCLUDING TOLL FACILITIES. SEE TABLE LF-1, NOTE 1 FOR ADDITIONAL INFORMATION ON LOCAL HIGHWAY FINANCE SERIES.
2/ IDENTIFIABLE DISBURSEMENTS FOR RIGHT-OF-WAY. IN SOME CASES, THESE EXPENDITURES MAY BE INCLUDED WITH CONSTRUCTION COSTS.
3/ ENGINEERING COSTS WERE ESTIMATED WHEN THE COMPLETE CLASSIFICATION OF EXPENDITURES WAS NOT AVAILABLE.
4/ TRAFFIC POLICE COSTS WHEN COMMINGLED WITH GENERAL POLICE ACTIVITIES ARE USUALLY NOT REPORTED. IN SOME INSTANCES, ESTIMATES WERE USED.
5/ INCLUDES PAYMENTS FOR LONG AND SHORT TERM DEBT. ALSO, THE INTEREST COLUMN INCLUDES SMALL CHARGES FOR ADMINISTRATION.
6/ ESTIMATED BY FHWA.
7/ DATA INCLUDED IN THE COUNTY AND TOWNSHIP HIGHWAY FINANCE SERIES.
8/ NOT ESTIMATED DUE TO INCOMPLETE HISTORICAL DATA.

Source: Highway Statistics, 1985

TABLE 2-5. DISBURSEMENTS BY COUNTIES AND TOWNSHIPS FOR HIGHWAYS - 1984

COMPILED FROM REPORTS OF STATE AND LOCAL GOVERNMENTS

(THOUSANDS OF DOLLARS)

TABLE LF-2
SEPTEMBER 1986

STATE	CAPITAL OUTLAY				MAINTENANCE			TRAFFIC POLICE	ADMINISTRATION AND MISCELLANEOUS	INTEREST 4/	SUBTOTAL, CURRENT DISBURSEMENTS	DEBT REFIREMENT 5/	TRANSFERS TO		NON-HIGHWAY	TOTAL
	RIGHT-OF-WAY 2/	ENGINEERING 3/	CONSTRUCTION	TOTAL	ROADS AND BRIDGES	SNOW REMOVAL	TOTAL						STATE GOVERNMENTS	LOCAL GOVERNMENTS		
ALABAMA 1/ 6/	262	2,096	32,230	34,588	120,590	-	120,590	399	9,206	4,872	169,315	1,717	12,176	-	-	183,208
ALASKA	693	12,760	9,875	23,328	2,884	869	3,753	75	90	7,008	34,214	1,317	-	-	-	35,531
ARIZONA 6/	1,200	4,009	32,135	37,344	31,200	3,072	34,272	2,876	3,289	2,093	101,074	3,042	1,901	-	-	106,017
ARKANSAS 6/	229	1,232	32,934	34,395	37,508	-	37,508	919	18,180	-	90,998	-	1,922	8,988	-	101,475
CALIFORNIA	7,849	10,122	159,587	177,858	275,200	4,020	279,220	34,373	67,933	1,984	560,638	8,985	21,183	48,330	9,012	648,550
COLORADO	519	3,010	34,530	38,089	76,280	13,576	89,858	430	12,923	5,584	148,484	8,034	9,109	19,074	-	170,671
CONNECTICUT 6/	-	60	1,063	1,131	16,180	1,764	17,944	2,278	802	26	22,258	380	-	-	-	22,418
DELAWARE 1/ 6/	-	-	-	-	-	-	-	4,160	-	-	4,160	-	-	-	-	4,160
FLORIDA 6/	7,251	4,368	177,078	189,994	230,470	-	230,470	20,207	7,508	22,274	470,133	9,819	6,346	7,060	756	501,614
GEORGIA	2,179	2,039	48,368	50,586	111,654	-	111,654	8,903	11,222	2,121	182,496	9,060	-	-	-	187,556
HAWAII 6/	256	335	19,179	19,770	17,039	-	17,039	1,080	7,267	2,986	42,602	2,200	530	-	-	45,332
IDAHO	468	937	7,964	9,369	40,868	2,742	44,607	744	8,713	68	63,501	422	1,975	2,171	-	68,049
ILLINOIS 6/	2,294	22,079	99,503	123,866	213,330	5,701	219,031	94	28,924	1,301	373,216	9,909	30,544	-	18,000	408,669
INDIANA	2,629	6,872	68,724	74,925	89,888	12,256	98,144	2,034	8,530	687	184,417	33	7,598	411	-	192,459
IOWA	3,440	3,462	47,551	54,473	151,626	12,643	164,269	1,637	27,923	-	242,982	-	1,002	261	-	244,285
KANSAS 6/	59	3,958	39,317	43,334	100,475	-	100,475	1,818	1,668	4,787	151,782	1,248	8,115	3,340	-	164,456
KENTUCKY 6/	444	2,783	26,247	29,474	40,608	2,200	42,808	5,411	5,376	186	83,258	-	2,914	97	-	86,266
LOUISIANA	-	2,059	21,057	23,192	126,449	-	126,449	6,943	13,473	13,231	193,248	41,860	-	-	-	235,108
MAINE	-	184	1,863	2,047	10,701	13,808	24,810	1,092	2,198	21	29,638	190	4,007	-	-	34,032
MARYLAND 1/ 6/	1,857	3,322	42,477	47,656	68,602	5,685	72,287	18,142	19,463	18,729	170,277	5,747	91	1,659	-	178,774
MASSACHUSETTS	198	2,954	11,561	14,272	16,978	4,717	21,695	1,651	3,608	551	41,977	2,447	98	935	-	45,454
MICHIGAN 6/	-	3,082	40,940	44,022	341,014	30,889	371,903	7,934	18,697	6,503	449,019	6,966	1,338	1,910	-	459,241
MINNESOTA	6,388	9,627	143,886	159,901	155,998	21,695	177,034	28,938	26,877	2,390	395,940	8,385	11,463	9,165	-	418,973
MISSISSIPPI 6/	-	1,886	25,054	26,940	117,447	-	117,447	1,701	8,380	2,040	153,316	707	4,934	4,131	-	162,588
MISSOURI 6/	6	2,904	23,633	26,543	84,508	3,536	88,110	3,187	4,182	6,370	128,400	2,015	603	-	-	131,018
MONTANA	811	1,252	4,598	6,761	36,273	644	37,681	432	4,648	88	49,024	100	-	-	-	49,124
NEBRASKA	277	2,621	18,495	21,393	83,657	200	83,857	2,541	6,492	2,687	119,390	1,719	4,104	39	-	125,107
NEVADA	7,661	2,726	29,079	40,266	4,589	350	4,939	4,618	9,317	2,600	57,732	-	2,308	1,496	-	61,576
NEW HAMPSHIRE 6/	-	197	2,503	2,700	4,444	4,804	9,248	1,300	1,493	226	14,967	448	513	-	-	15,928
NEW JERSEY 6/	1,219	5,200	52,537	58,952	66,698	12,037	81,535	13,759	9,501	810	164,657	10,874	-	-	1,201	176,732
NEW MEXICO 6/	17	126	4,866	5,009	13,448	-	13,448	1,040	373	-	19,867	-	829	-	-	20,692
NEW YORK 6/	857	16,207	163,903	180,967	292,550	89,146	381,696	48,334	41,382	26,384	698,563	83,741	-	10,788	-	801,092
NORTH CAROLINA 1/	-	-	-	-	-	-	-	-	-	6	6	38	1,316	-	-	1,362
NORTH DAKOTA 6/	708	1,673	17,932	19,913	27,628	2,119	29,747	409	1,358	109	51,422	68	6,928	203	-	58,228
OHIO 6/	728	4,592	56,332	61,652	276,600	10,118	286,718	6,406	20,818	846	383,137	8,744	10,902	9,720	-	409,503
OKLAHOMA 1/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OREGON	1,324	7,787	34,264	43,365	69,765	2,210	56,013	6,001	11,761	616	129,758	1,209	1,729	1,788	-	134,484
PENNSYLVANIA	-	3,024	43,978	47,002	151,043	15,959	167,062	57,846	36,310	2,849	302,349	12,193	3,481	1,964	-	317,987
RHODE ISLAND	-	24	312	336	919	199	1,119	165	68	-	1,679	-	-	-	-	1,679
SOUTH CAROLINA 6/	15	331	6,645	6,991	28,654	7	28,661	1,906	2,092	114	37,324	642	374	629	-	38,770
SOUTH DAKOTA	7	945	12,848	13,800	37,783	2,707	40,490	1,252	1,139	-	56,412	-	2,050	875	-	59,347
TENNESSEE	193	1,844	17,561	19,598	81,667	3,403	85,070	68	6,287	2,261	113,985	3,068	3,693	-	3,180	124,826
TEXAS	3,267	16,493	128,432	148,192	243,608	-	243,608	9,098	72,384	42,444	515,725	48,918	5,960	-	-	570,604
UTAH	196	606	4,077	5,879	21,301	3,193	24,494	368	6,284	-	37,025	-	2,100	-	-	39,125
VERMONT 6/	18	256	7,147	7,821	21,951	6,849	28,700	79	1,867	95	38,266	50	-	-	-	38,316
VIRGINIA 1/ 6/	317	1,210	12,235	13,762	6,703	413	7,116	36,300	516	1,857	60,051	2,901	5,591	224	-	68,767
WASHINGTON	3,829	12,259	59,838	75,922	109,115	6,584	116,703	8,032	34,326	5,924	237,907	2,698	638	2,142	-	243,386
WEST VIRGINIA 1/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WISCONSIN	-	8,518	96,246	104,764	185,700	16,148	201,848	62,051	11,394	4,051	384,908	12,242	8,283	1,371	-	406,804
WYOMING	86	872	8,407	9,368	18,287	1,212	19,479	1,117	1,083	-	31,045	-	930	-	-	32,775
TOTAL	59,493	196,338	1,940,688	2,196,299	4,264,029	319,747	4,584,576	433,938	583,274	200,853	7,998,937	296,798	167,240	138,202	28,919	8,627,176

1/ THIS TABLE RECORDS DISBURSEMENTS FOR ROAD AND STREET PURPOSES, INCLUDING TOLL FACILITY DATA, BY COUNTY AND TOWNSHIP GOVERNMENTS. REFER TO TABLE LF-1, NOTE 1 FOR ADDITIONAL INFORMATION CONCERNING THE LOCAL HIGHWAY FINANCE SERIES.

2/ IDENTIFIABLE DISBURSEMENTS FOR RIGHT-OF-WAY. IN SOME CASES, THESE EXPENDITURES MAY BE INCLUDED WITH CONSTRUCTION COSTS.

3/ ENGINEERING COSTS WERE ESTIMATED WHEN THE COMPLETE CLASSIFICATION OF EXPENDITURES WAS NOT AVAILABLE.

4/ INCLUDES PAYMENTS FOR LONG AND SHORT TERM DEBT; INTEREST COLUMN ALSO INCLUDES SMALL CHARGES FOR DEBT ADMINISTRATION.

5/ COUNTY ROADS ARE UNDER STATE CONTROL IN DELAWARE (EXCEPT TRANSACTIONS UNDER PADVISIONS OF THE 1949 SUBURBAN COMMUNITY ROAD ACT), NORTH CAROLINA, WEST VIRGINIA, TEN COUNTIES IN ALABAMA, ALL BUT TWO COUNTIES IN VIRGINIA, AND IN MARYLAND THE STATE PERFORMS THE HIGHWAY FUNCTION IN SIX COUNTIES. DATA FOR THESE SYSTEMS ARE INCLUDED IN THE STATE HIGHWAY FINANCE SERIES.

6/ ESTIMATED BY FHWA.

7/ NOT ESTIMATED DUE TO INCOMPLETE HISTORICAL DATA.

Source: Highway Statistics, 1985

TABLE 2-6. FEDERAL-AID FUNDING PERCENT BY FUNDING CATEGORY

Category	Percent
Interstate	94.27
Federal-Aid Primary	92.48
Federal-Aid Secondary	92.48
Urban	92.48
Hazard Elimination, Safety, Traffic Operation and TSM	90.00
Bridge	80.00

Source: ADOT

The five year total federal expenditures by state reported in Highway Statistics were used as control totals. Federal, state, and local expenditure estimates describing the existing conditions were adjusted such that the reported and estimated federal totals were in agreement for the study period. This procedure is detailed in Chapter 3. The reported federal expenditures by state are shown in Table 2-7.

TABLE 2-7. EXPENDITURE OF FEDERAL FUNDS ADMINISTERED BY THE FEDERAL HIGHWAY ADMINISTRATION DURING CALENDAR YEAR (THOUSANDS OF DOLLARS)

State	1981	1982	1983	1984	1985	Total
Arizona	141,633	103,964	101,189	185,497	227,284	809,567
North Carolina	190,029	160,176	149,935	240,519	287,415	1,028,074
Pennsylvania	379,891	389,904	329,842	480,468	730,650	2,310,755
Washington	389,670	305,102	241,158	323,686	350,995	1,510,611

Source: Highway Statistics, 1981, 1982, 1983, 1984, 1985 (Table FA-3)

State or local expenditures were taken as the sum of the state or local expenses for non-federal-aid projects plus the state or local percent of expenses on federal-aid projects. These data were taken directly from the FHWA 534 forms. Local expenditures for local roads were estimated as the difference between the expenses reported on the FHWA 536 forms as summarized in Highway Statistics, and those expenses reported on the FHWA 534 forms for local governments.

There are 17 individual expense categories reported on FHWA Form 534. In order to reduce the size of the spreadsheet matrix and to facilitate the comparison of the results to other data sources, these expense categories were aggregated to the eight individual items shown in Table 2-8.

TABLE 2-8. ANALYSIS EXPENSE CATEGORIES

Right-of-Way
Engineering
New Construction
Total Reconstruction
Total Bridge
Safety/Traffic Operations/TSM
Environmental
Total Maintenance

STATE SELECTION

To reduce credibility problems with FHWA Form 534 data from other states the availability and reliability of the data were used as a primary selection criteria. A list of states was obtained from the FHWA indicating those states thought to submit reliable state data, and indicating which states consistently reported local expenditures. A listing of the states regarded as supplying reliable state level data is given in Table 2-9. From this list, four states were selected as candidates for this study and follow-up contacts were made at the state level to discuss data reporting procedures. These states were Iowa, North Carolina, Pennsylvania, and Washington. Each of the four states confirmed that the state level data was compiled from accounting procedures that keyed expenditures to roadway functional class. Therefore, the data were considered reliable.

TABLE 2-9. STATES INDICATED TO HAVE REPORTED RELIABLE STATE LEVEL FHWA FORM 534 DATA FOR 1985 AND TO HAVE REPORTED LOCAL LEVEL DATA FOR 1983 OR 1984

State	Reported Local Data 1983	Reported Local Data 1984
Alabama	X	
Georgia	X	
Illinois	X	
Indiana		
Iowa	X	X
Kansas	X	
Kentucky	X	
Michigan		
Minnesota		X
Missouri	X	X
Montana	X	
New Hampshire		
New Mexico		
North Carolina	X	
North Dakota	X	
Ohio		
Oregon		X
Pennsylvania	X	X
Rhode Island		
South Dakota	X	X
Tennessee	X	
Texas		
Utah	X	X
Vermont	X	
Virginia		
Washington	X	X
Wisconsin		

The four states, in addition to Arizona, were reduced to three after reviewing data describing the comparison of federal highway trust fund receipts attributable to the states and federal-aid apportionments from the fund. These data, shown in Table 2-10, indicated that three of the states, including Arizona, have received significantly more from the fund then they have contributed. Pennsylvania has received approximately the same amount that it has contributed, and North Carolina has received considerably less funding than it has contributed. It was desirable to include states on both sides of this donor/donee issue, therefore Washington and North Carolina were included for further study. Pennsylvania was selected because it was the closest to being neutral on this issue.

TABLE 2-10. RATIO OF APPORTIONMENTS TO PAYMENTS FROM THE FEDERAL HIGHWAY TRUST FUND

State	Fiscal Year 1984	Fiscal Year 1985	Cumulated [a]
Arizona	1.65	1.24	1.52
Iowa	1.33	1.40	1.13
North Carolina	0.84	1.04	0.83
Pennsylvania	1.05	1.42	1.12
Washington	1.48	1.78	1.70

(a) Cumulated since 7-1-56 through Fiscal Year 1985

Source: Highway Statistics 1984 and 1985 (Table FE-221)

ESTIMATING MISSING DATA

Unfortunately, not all of the data required were available for each year of the analysis period. For example, the information in Table 2-3 indicates the available and missing data for each year of the study period. Missing data items were estimated based on existing data and trends in expenditures.

The estimation of missing data was performed at two levels of analysis. The first and most complex estimation procedure was designed to estimate the data that was not reported by the local jurisdictions within the State of Arizona. Table A-6 in Appendix A indicates the existing data and missing data for the local jurisdictions in Arizona. There are 79 municipalities and 15 counties in Arizona which are required to report highway expenditures. Only 19 had completed expenditure reports for the period 1981 through 1986. The 1986 data were included in the estimation of missing data because it provided a data point beyond the study period allowing for the interpolation of trends, and because the data reporting was more complete than that for either 1984 or 1985.

Of the possible quantities in the matrix shown in Table A-6, 65.8 percent (371 values) were reported. The reported data accounted for over 78 percent of the estimated total local expenditures. A detailed estimation procedure was employed for the Arizona data so that the best available information would be used for the analysis of the impacts within the state.

The missing local jurisdiction expenditure data was estimated for each year of the study period. The estimation procedure was based on a linear regression determination of the annual change in the expenditures by local governments using the existing data. The annual change in expenditures per jurisdiction was aggregated to represent an estimate of the statewide annual change. The statewide estimate of the annual change was factored based on the population of the jurisdictions to account for the effect of missing data, and this value was used to generate an initial estimate of the total statewide annual highway expenditures for local jurisdictions. The initial annual totals were then factored by the proportion each jurisdiction represented of the sum of the average annual expenditures based on the existing data. These values represented the estimates of the missing annual expenditures. The final statewide totals for the local jurisdictions were calculated as the sum of the existing data and the missing data estimates. A detailed description of this procedure is given in Appendix A.

A second level of estimation was used for the missing data from other states, and for the state expenditures for Arizona in 1981. Annual state or local totals for expenditures were estimated for those years with missing data. These totals were

then proportioned among roadway functional classes and spending categories based on historical percentages. This essentially created a FHWA Form 534 from the state and local estimates of total annual expenditures. Details of this procedure are contained in Appendix A.

SPREADSHEET DEVELOPMENT

A spreadsheet was developed as the programming mechanism for the analysis of the redistribution scenarios. A sample of the data contained in the spreadsheet is shown in Table 2-11. The spreadsheet in Table 2-11 contains data representing the expenditures for Arizona for the period 1981 through 1985. Data are presented for four rural functional classes, and are stratified by federal, state, and local expenditures and eight expenditure categories. Overall, the spreadsheet contains data for six rural and six urban functional classes of roadway.

Spreadsheets were generated for each of the four states selected for analysis, and the data were entered representing the historical expenditures for the study period. The percent of federal participation, indicated in the column headed by "Percent Federal Dollars," was used to calculate the federal expenditures for each roadway type and spending category based on the state and local jurisdiction data. The total and percent of total expenditures attributed to each jurisdiction is given in the last six columns on the right-hand side of the spreadsheet.

A complete set of data describing the historical distribution of expenditures for each state is given in Appendix C. A User's Guide describing the spreadsheet model is also contained in Appendix C.

The hypothetical redistribution of the jurisdiction over the highway system was accomplished by manipulating the federal matching ratios in the "Percent Federal Dollars" column. For example, a scenario where the Federal Government turns over total responsibility for a roadway type to state and local governments is simulated by reducing the "Percent Federal Dollars" to zero. Total responsibility by the Federal Government was represented by a value of "Percent Federal Dollars" equal to 100. Federal responsibility for a portion of a roadway type was simulated by the equivalent percent in the "Percent Federal Dollars" column.

TABLE 2-11. SAMPLE OF SPREAD SHEET

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985) — SCENARIO 0 — EXISTING CONDITIONS

STATE OF ARIZONA (THOUSANDS OF DOLLARS)	FEDERAL/STATE (141) FED AID PROJECT	FEDERAL/STATE (141) NON FED AID PROJ	FEDERAL/STATE (141) FEDERAL AID SYSTEM	FEDERAL/LOCAL (142) FED AID PROJECT	FEDERAL/LOCAL (142) NON FED AID PROJ	FEDERAL/LOCAL (142) FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
RURAL INTERSTATE													
RIGHT OF WAY	14357	461	0	0	0	0	94.27%	13535	1283	0	91.34%	8.66%	0.00%
PRELIM ENGIN	29395	1363	0	0	0	0	94.27%	27711	3048	0	90.09%	9.91%	0.00%
NEW CONSTRUCT	33367	0	0	0	0	0	94.27%	88018	5350	0	94.27%	5.73%	0.00%
TOT RECONSTRUCT	133687	624	0	0	0	0	94.27%	126026	8294	0	93.83%	6.17%	0.00%
TOTAL BRIDGE	6940	699	0	0	0	0	80.00%	5520	2079	0	72.64%	27.36%	0.00%
SFTY/TRF-OP/TSM	37443	375	0	0	0	0	90.00%	33698	4119	0	89.11%	10.89%	0.00%
ENVIRONMENTAL	2088	0	0	0	0	0	94.27%	1968	120	0	94.27%	5.73%	0.00%
TOT MAINTENANCE	0	0	46799	0	0	0		0	46799	0	0.00%	100.00%	0.00%
TOTAL *****	317237	3522	46799	0	0	0		296476	71082	0	80.66%	19.34%	0.00%
RURAL OTHER PRINCIPAL ARTERIAL													
RIGHT OF WAY	1309	6442	0	134	0	0	92.48%	1334	6540	10	15.92%	82.95%	0.13%
PRELIM ENGIN	2998	2908	0	325	887	0	92.48%	3073	3213	911	42.69%	44.64%	12.66%
NEW CONSTRUCT	29	0	0	0	0	0	92.48%	27	2	0	92.48%	7.52%	0.00%
TOT RECONSTRUCT	45981	28149	0	1885	5785	0	94.27%	44275	30732	5893	54.73%	37.99%	7.28%
TOTAL BRIDGE	129	0	0	538	0	0	80.00%	534	26	108	80.00%	3.87%	16.13%
SFTY/TRF-OP/TSM	1930	996	0	18	1876	0	90.00%	1753	1189	1878	36.37%	24.68%	38.96%
ENVIRONMENTAL	0	0	0	0	0	0	92.48%	0	0	0	0.00%	0.00%	0.00%
TOT MAINTENANCE	0	0	33787	0	0	48732		0	33787	48732	0.00%	40.94%	59.06%
TOTAL *****	51475	38574	33787	2900	8548	48732		50995	75490	57532	27.71%	41.02%	31.26%
RURAL MINOR ARTERIAL													
RIGHT OF WAY	1818	844	0	44	0	0	92.48%	1722	981	3	63.63%	36.25%	0.12%
PRELIM ENGIN	4439	2950	0	82	224	0	92.48%	4181	3283	230	54.33%	42.67%	2.99%
NEW CONSTRUCT	0	1	0	0	0	0	92.48%	0	1	0	0.00%	100.00%	0.00%
TOT RECONSTRUCT	32896	10790	0	1446	4438	0	94.27%	32365	12674	4521	65.36%	25.57%	9.12%
TOTAL BRIDGE	6520	0	0	254	0	0	80.00%	5419	1304	51	80.00%	19.25%	0.75%
SFTY/TRF-OP/TSM	1838	1033	0	2	212	0	90.00%	1656	1217	212	53.68%	39.44%	6.88%
ENVIRONMENTAL	0	22	0	0	0	0	92.48%	0	22	0	0.00%	100.00%	0.00%
TOT MAINTENANCE	0	0	45437	0	0	14844		0	45437	14844	0.00%	75.38%	24.62%
TOTAL *****	47500	15640	45437	1828	4874	14844		45342	64919	19861	34.85%	49.89%	15.26%
RURAL MAJOR COLLECTOR													
RIGHT OF WAY	771	789	0	15878	2176	0	92.48%	15397	847	3370	78.50%	4.32%	17.18%
PRELIM ENGIN	1782	1867	0	19714	164	0	92.48%	19879	2001	1646	84.50%	8.51%	7.00%
NEW CONSTRUCT	0	0	0	18	0	0	92.48%	17	0	1	92.48%	0.00%	7.52%
TOT RECONSTRUCT	4944	9852	0	44826	2554	0	94.27%	50689	10364	5123	76.60%	15.66%	7.74%
TOTAL BRIDGE	4662	2989	0	860	0	0	80.00%	4578	3961	172	52.55%	45.47%	1.97%
SFTY/TRF-OP/TSM	2314	390	0	9802	1332	0	90.00%	10904	622	2312	78.80%	4.49%	16.71%
ENVIRONMENTAL	0	0	0	58	0	0	92.48%	54	0	4	92.48%	0.00%	7.52%
TOT MAINTENANCE	0	0	15683	0	0	16556		0	15683	16556	0.00%	48.65%	51.35%
TOTAL *****	18673	15987	15683	91156	6226	16556		101518	33479	29185	61.83%	20.39%	17.78%

REDISTRIBUTION SCENARIOS

The redistribution scenarios were designed primarily to evaluate the impacts of shifting the responsibility for routes of interstate significance from state and local government to the Federal Government. Under the existing conditions the Federal Government contributes funds for roadway expenditures for all roadway classifications except urban and rural local. Not all roadway projects qualify for federal funding. The interstate highways and roadways designated (as included in the Federal-Aid Primary and Federal-Aid Secondary programs) receive most of the funding. All of the expenditure categories except maintenance are eligible for federal matching funds, as indicated in Table 2-11.

The Federal Government does not currently assume total responsibility for highway system, i.e., the expenses associated with development, operations, and maintenance of a roadway. Under the scenarios defined for this study, the Federal Government would assume total responsibility for portions of the highway system designated as having interstate significance, and eliminate any support for other highways. In effect, state and local governments would be required to manage highway expenditures from state and local revenue sources.

Seven alternative scenarios were developed to evaluate the impacts of the redistribution of responsibility. Conceptually, a system of interstate significance would naturally contain the interstate highway system as the basic element. This was the basis for Scenario 1, and was a major portion of each scenario. The other scenarios added varying portions of the rural principal arterial system and the urban freeway/expressway system to the interstate highways as the routes of interstate significance. These scenarios are summarized in Table 2-12.

The evaluation of the impacts of the redistribution scenarios was based on the shift in the expenditures that would have resulted if the scenario had been instituted at the beginning of the study period. The initial evaluation assumed that the cost of roadway improvements would not be affected by the redistribution of responsibility. An assessment of cost savings which could result from removing federal requirements from projects was also made.

TABLE 2-12. SCENARIO FOR THE FEDERAL INTERSTATE SIGNIFICANCE HIGHWAY SYSTEM

	Percent of Functional Class		
Scenario	Interstate	Rural Principal Arterial	Urban Freeway/Expressway
1	100	0	0
2A	100	25	0
2B	100	50	0
2C	100	75	0
3A	100	50	50
3B	100	100	100

3. ANALYSIS OF RESULTS

EXISTING CONDITIONS

The impact of the redistribution scenarios on individual states is primarily related to the existing funding relationship between the federal, state, and local governments. The aggregate estimates of the federal expenditures in each state during the study period are shown in Table 3-1 along with the FHWA values reported in Highway Statistics. The modeling system estimated federal expenditures on a disaggregate basis by roadway functional class and spending category. The aggregation of the results shown in Table 3-1 reveals excellent agreement with the data reported by FHWA for North Carolina and Washington. The estimated aggregate federal expenditure exceeded the reported value by 28.5 percent for Pennsylvania. Although this estimation error was higher than desirable, it was not considered sufficiently inaccurate to alter the general conclusions derived for the results.

TABLE 3-1. ESTIMATED AND REPORTED FEDERAL EXPENDITURES

(1981-1985 MILLIONS OF DOLLARS)

	State			
	Arizona	North Carolina	Pennsylvania	Washington
Estimated	1,456.9	1,055.8	2,969.7	1,704.4
Reported[a]	809.6	1,028.1	2,310.8	1,510.6
Percent Difference	80.0	2.7	28.5	12.8

(a) Source: Highway Statistics, 1981, 1982, 1983, 1984, 1985 (Table FA-3)

The estimate of federal expenditures for Arizona exceeded the reported amount by 80 percent. This represents an unacceptable level of error and it has serious implications in terms of the reliability of the results. An explanation for the discrepancy in the estimate for Arizona and the other states is contained in the

modeling procedure and database used in the estimates. Local level expenditure data for Arizona was supplied by ADOT and approximately 20 percent of the data required estimation (see Appendix A). The reporting of the distribution of local expenditures between federal-aid and non-federal-aid projects was very sporadic. This distribution required estimation based on two years of aggregate data supplied by ADOT (see Appendix A Tables A-15 and A-16). The estimation procedure resulted in the distribution of expenditures between federal, state, and local jurisdictions shown in Table 3-2 by roadway functional class.

TABLE 3-2. ESTIMATED PERCENT DISTRIBUTION OF EXPENDITURES FOR ARIZONA

Functional Class	Federal	State	Local
Rural			
Interstate	80.7	19.3	0.0
Principal Arterial	27.7	41.0	31.3
Minor Arterial	34.8	49.9	15.3
Major Collector	61.8	20.4	17.8
Minor Collector	0.0	15.5	84.5
Local	0.0	0.0	100.0
Urban			
Interstate	83.4	16.6	0.0
Other Freeway	61.6	38.4	0.0
Principal Arterial	51.4	0.6	48.0
Minor Arterial	38.6	0.5	61.0
Collector	19.8	0.2	80.0
Local	0.0	0.0	100.0

A comparison of the values for Arizona, given in Table 3-2, to those generated for the other states, shown in Tables 3-3 through 3-5, reveals the most likely source of the problem with the Arizona estimates. The data indicate what appears to be an inordinate share of expenditures attributed to the federal level for local roadways, and this is accompanied by a less than reasonable share of state expenses. For example, the distribution of expenditures for urban principal arterials is 51.4 percent federal, 0.6 percent state and 48.0 percent local. This is a direct result of the distribution between federal-aid projects and non-federal-aid projects for local

roadways generated from data supplied by ADOT for 1981 and 1982 (see Table A-16 Appendix A), and the accounting procedure where federal matching ratios (see Table 2-6) were applied to all federal-aid project monies to determine the federal share. The data in Table A-16 Appendix A indicate that 43 percent of the expenditures on urban principal arterials were associated with federal-aid projects. None of this money was assigned to the state level in this accounting procedure, hence the resultant estimate in the state level expenditures for urban principal arterials. Similar statements can be made concerning urban minor arterials, collectors, and rural major collectors.

TABLE 3-3. ESTIMATED PERCENT DISTRIBUTION OF EXPENDITURES FOR NORTH CAROLINA

Functional Class	Federal	State	Local
Rural			
Interstate	82.5	17.5	0.0
Principal Arterial	58.9	41.1	0.0
Minor Arterial	45.2	54.7	0.1
Major Collector	33.9	65.9	0.2
Minor Collector	3.1	96.5	0.3
Local	0.0	0.0	0.0
Urban			
Interstate	84.2	15.8	0.0
Other Freeway	69.4	29.5	1.1
Principal Arterial	46.1	49.8	4.1
Minor Arterial	30.9	54.8	14.2
Collector	9.4	38.3	52.4
Local	0.0	0.0	100.0

TABLE 3-4. ESTIMATED PERCENT DISTRIBUTION OF EXPENDITURES FOR PENNSYLVANIA

Functional Class	Federal	State	Local
Rural			
Interstate	77.9	22.1	0.0
Principal Arterial	43.4	56.6	0.0
Minor Arterial	16.0	84.0	0.0
Major Collector	40.8	59.2	0.0
Minor Collector	12.9	4.4	82.7
Local	0.0	0.0	100.0
Urban			
Interstate	79.2	20.8	0.0
Other Freeway	55.7	44.3	0.0
Principal Arterial	59.1	40.9	0.0
Minor Arterial	6.1	93.9	0.0
Collector	7.7	24.8	67.5
Local	0.0	0.0	100.0

TABLE 3-5. ESTIMATED PERCENT DISTRIBUTION OF EXPENDITURES FOR WASHINGTON

Functional Class	Federal	State	Local
Rural			
Interstate	86.0	14.0	0.0
Principal Arterial	31.8	68.2	0.0
Minor Arterial	38.9	21.0	40.1
Major Collector	25.3	9.2	65.5
Minor Collector	22.6	5.2	72.2
Local	0.0	0.0	100.0
Urban			
Interstate	71.9	28.1	0.0
Other Freeway	59.6	40.7	0.0
Principal Arterial	62.9	37.1	0.0
Minor Arterial	33.9	10.6	55.5
Collector	0.2	0.6	99.2
Local	0.0	0.0	100.0

The underlying reason for this errant accounting of expenditures for Arizona is not clear. However, the error appears to be in the attribution of funds between federal-aid and non-federal-aid projects for local jurisdictions in Arizona based on the 1981 and 1982 data. It should be noted that an adjustment in the distribution of expenditures for urban principal arterials, minor arterials, collectors and rural major collectors such that these figures appear consistent with the jurisdictional responsibility of these highways, could easily account for the aggregate overestimation in the federal share of expenditures.

The estimated existing condition for each state is shown in Table 3-6. The total expenditures for each state, and the reported federal expenditures given in Table 3-1, were used as control totals to determine the adjusted representation of the existing condition. The state and local share of total expenditures were adjusted based on the percent that they represented of the total federal-aid project monies within each state.

TABLE 3-6. ESTIMATED EXISTING CONDITION FOR EACH STATE

	Millions of Dollars				Percent		
State	Federal	State	Local	Total	Federal	State	Local
Arizona	1,456.9	368.1	1,939.7	3,764.7	38.7	9.8	51.5
North Carolina	1,055.9	985.5	433.9	2,475.3	42.7	39.8	17.5
Pennsylvania	2,969.7	3,011.5	1,845.8	7,827.0	37.9	38.5	23.8
Washington	1,704.4	667.1	1,445.1	3,816.6	44.7	17.5	37.8

The results of this final adjustment are shown in Table 3-7. The values in Table 3-7 represent the existing condition used for comparative analysis with the redistribution scenarios. The redistribution scenarios for North Carolina, Pennsylvania, and Washington were not affected significantly by errors in the estimation of the existing federal expenditures because the accounting procedure assigned the total cost, or a percent thereof, for a given roadway class to each of the jurisdictions.

TABLE 3-7. ADJUSTED EXISTING CONDITION FOR EACH STATE

State	Percent of Total Expenditures			
	Federal	State	Local	State and Local
Arizona	21.5	19.6	58.9	78.5
North Carolina	41.6	40.9	17.5	58.4
Pennsylvania	29.5	46.6	23.8	70.4
Washington	39.6	21.6	38.8	60.4

A major factor in establishing the distribution of expenditures shown in Table 3-7 are the current state policies for establishing highway jurisdictional responsibility, and the amount of state highway revenues that are passed back to the local governments. ADOT currently returns 50 percent of state highway revenues directly to local governments. In the accounting procedure for this study these funds are considered local expenditures. As shown in Table 3-8, there is a direct relationship between the share of total expenditures attributed to local governments and the amount of state revenues returned to local governments for local highway improvements.

TABLE 3-8. PERCENT OF STATE HIGHWAY REVENUES RETURNED TO LOCAL GOVERNMENTS

State	Percent
Arizona	50
North Carolina	7
Pennsylvania	12
Washington	34

Source: State Revenue Reports

The most consistent indicator of the impact of the redistribution across states is the change in the total state plus local responsibility. This normalizes the effect of the existing state policies on responsibility and the effect of policies regarding the return of state revenues to local governments. Arizona state and local governments have contributed the largest percent of total expenditures of the four states evaluated in this study as shown in Table 3-7.

To further establish the credibility of the modeling procedure, a comparison was made between the adjusted existing condition for the State of Washington (given in Table 3-7), and the results of the Washington Department of Transportation report (WDOT 1983). The WDOT report contained a history of the sources of revenue for Washington highway expenditures for the years 1962 through 1982 on an annual basis. The data from the report for 1981 (the only year with complete data which was coincident with the time period of this study) is given in Table 3-9. The data in Table 3-9 indicate the percent of total revenues applied to highway expenditures attributed to federal, state and local sources. The percent of total revenues attributed to state and local sources must be adjusted by the proportion of state revenues passed back to local jurisdictions for these data to be compared to the data in Table 3-7. This adjustment is made in the data presented in Table 3-10. The data presented in Table 3-10 indicate very reasonable agreement between the five year estimate of the average distribution of expenditures between jurisdictions for Washington, and those reported in the WDOT study for 1981.

TABLE 3-9. WASHINGTON DISTRIBUTION OF REVENUE BY JURISDICTION FOR 1981

	Revenues	
Jurisdiction	Thousands of Dollars	Percent of Total
Federal	247,896	34.5
State	306,046	42.5
Local	165,105	23.0

Source: WDOT (1983)

TABLE 3-10. COMPARISON OF REPORTED AND ESTIMATED EXPENDITURE DISTRIBUTION FOR WASHINGTON

	Jurisdiction			
	Federal	State	Local	State and Local
Reported[a,b]	34.5	28.1	37.4	65.5
Estimated	39.6	21.6	38.8	60.4

(a) Source: WDOT (1983), represents only 1981
(b) Adjusted to reflect 34 percent pass back of state revenues to local jurisdictions

REDISTRIBUTION SCENARIOS

A summary of the redistribution scenarios is repeated for convenience in Table 3-11. It was assumed in each scenario that federal participation was confined to the roadway classes designated as having interstate significance. All costs associated with the roadway classes on the federal system then became federal expenditures. All expenditures on roadways not on the federal system were assumed to become state or local expenditures. For example, what had been designated as a federal expenditure on a rural principal arterial roadway project funded in conjunction with the state government, was considered totally a state expenditure under the redistribution scenarios. Aggregate roadway expenditures for all jurisdictions remained constant for a given state over all scenarios.

TABLE 3-11. SCENARIO FOR THE FEDERAL INTERSTATE SIGNIFICANCE HIGHWAY SYSTEM

	Percent of Functional Class		
Scenario	Interstate	Rural Principal Arterial	Urban Freeway/Expressway
1	100	0	0
2A	100	25	0
2B	100	50	0
2C	100	75	0
3A	100	50	50
3B	100	100	100

The data in Table 3-12 is provided to aid with the analysis of the impacts of the scenarios on the redistribution of funding. The data in Table 3-12 represents the mileage of each roadway functional class in each of the study states.

The data presented in Tables 3-13 through 3-16 represent the percent of total expenditures by federal, state, and local governments for each state and scenario. Included with these data is the number of miles of roadway that would be designated as part of the federal system under each scenario.

Scenario 1

Limiting federal-aid to the interstate highway system shifts a substantial burden of highway finance to the state and local governments, while the percent participation of the Federal Government declines in each case. The states with the least miles of interstate highway (North Carolina and Washington) have the highest shift of expenditures to state and local governments. For North Carolina the state and local expenditures increase from 58.4 percent to 80.9 percent, with the greatest impact felt at the state level. The state plus local share increases from 60.4 percent to 72.6 percent for Washington, with the largest percent increase being felt at the local level.

In Arizona the state plus local share increases from 78.5 percent to 84.0 percent, while the federal participation declines from 21.5 percent to 16.0 percent of total expenditures. The data indicates a substantial increase in expenditures at the local level in Arizona, with a decrease in responsibility at the state level. This result appears biased by the error in the data described earlier, and is not considered reliable. However, the overall impact at the state plus local level is considered reasonable. This result is indicative of substantial federal support for the interstate system in Arizona under the existing conditions.

Pennsylvania's situation is similar to that for Arizona, where there is a smaller increase in state plus local expenditures under this scenario (from 70.4 to 79.8 percent). However, unlike Arizona, nearly all of the shift is felt at the state level in Pennsylvania. This results because Pennsylvania has responsibility for nearly the entire highway system that is eligible for federal-aid. The federal share would decline from 29.5 percent to 20.2 percent under this scenario.

TABLE 3-12. EXISTING PUBLIC ROAD AND STREET MILEAGE BY FUNCTIONAL CLASS (1985)

State	Rural						Urban						
	I	PA	MiA	MC	MiC	Lo	I	OF	PA	MiA	UC	Lo	Total
Arizona	1,055	1,198	2,344	3,970	3,573	54,789	111	6	1,012	1,430	981	6,437	76,906
North Carolina	595	2,046	2,037	10,495	9,182	51,008	200	207	1,643	2,134	1,342	12,325	93,214
Pennsylvania	1,164	1,732	6,041	8,039	8,673	60,946	360	316	2,881	2,726	3,150	19,585	115,663
Washington	489	1,815	2,580	7,231	6,498	47,035	238	175	1,224	1,460	1,709	10,620	81,074

Source: Highway Statistics, 1985 (Table HM-20)

I = Interstate
PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
Lo = Local
OF = Other Freeway/Expressway
UC = Urban Collector

TABLE 3-13. REDISTRIBUTION SCENARIO RESULTS FOR ARIZONA

Scenario	Percent of Expenditures				Federal Miles of Roadway
	Federal	State	Local	State and Local	
1	16.0	13.2	70.8	84.0	1,166
2A	17.2	12.5	70.3	82.8	1,466
2B	18.4	11.7	69.9	81.6	1,766
2C	19.6	10.9	69.4	80.4	2,065
2D	20.9	10.1	69.0	79.1	2,364
3A	20.6	9.5	69.9	79.4	1,769
3B	25.2	5.8	59.0	74.8	2,370

TABLE 3-14. REDISTRIBUTION SCENARIO RESULTS FOR NORTH CAROLINA

Scenario	Percent of Expenditures				Federal Miles of Roadway
	Federal	State	Local	State and Local	
1	19.1	62.8	18.1	80.9	795
2A	23.8	58.2	18.1	76.2	1,307
2B	28.4	53.5	18.1	71.6	1,618
2C	33.0	48.9	18.1	67.0	2,130
2D	37.6	44.3	18.1	62.4	2,641
3A	29.5	52.4	18.1	70.5	1,722
3B	39.9	42.0	18.0	60.1	2,848

TABLE 3-15. REDISTRIBUTION SCENARIO RESULTS FOR PENNSYLVANIA

Scenario	Percent of Expenditures				Federal Miles of Roadway
	Federal	State	Local	State and Local	
1	20.2	54.3	25.5	79.8	1,514
2A	22.9	51.6	25.5	77.1	1,957
2B	25.5	49.0	25.5	74.5	2,390
2C	28.1	46.4	25.5	71.9	2,823
2D	30.8	43.7	25.5	69.2	3,256
3A	27.8	46.7	25.5	72.2	2,548
3B	35.3	39.2	25.5	64.7	3,572

TABLE 3-16. REDISTRIBUTION SCENARIO RESULTS FOR WASHINGTON

Scenario	Percent of Expenditures				Federal Miles of Roadway
	Federal	State	Local	State and Local	
1	27.4	25.3	47.3	72.6	727
2A	27.8	24.9	47.3	72.2	1,181
2B	28.3	24.4	47.3	71.7	1,635
2C	28.8	23.9	47.3	71.2	2,088
2D	29.3	23.5	47.3	70.7	2,542
3A	33.1	19.6	47.3	66.9	1,722
3B	38.8	13.9	47.3	61.2	2,717

Scenario 2 (A, B, C and D)

Scenario 2 differs from Scenario 1 in that a varying percent of the rural principal arterial system is combined with the interstate system as the federal routes of interstate significance. In this scenario the percent of cost was used as a surrogate for the percent of roadway miles. The percent of the rural principal arterial system included was 25, 50, 75 and 100 for scenarios 2A, 2B, 2C and 2D respectively. The basic effect was to increase the number of miles of roadway given over to the Federal Government.

The general impact of this scenario was to increase the federal share of expenses in each state. In Arizona the federal share increased from 16.0 percent to 20.9 percent of total highway expenses for the five-year period when 100 percent of the rural principal arterial system was included with the interstate. The total roadway mileage given over to federal responsibility increased from 1,166 miles (interstates only) to 2,364 miles with the inclusion of the rural principal arterials. The percent of total expenses shared by the Federal Government under Scenario 2D approximates that under the existing conditions for Arizona.

For Arizona the shift in responsibility appears to be from the state level to the federal level, with little change in local government responsibility from that of Scenario 1. The total state and local share of expenses would vary from approximately 83 percent down to 79 percent under Scenario 2 conditions.

Each of the other states would appear to benefit significantly more than Arizona under the conditions of Scenario 2. The federal share of total expenditures would be the largest for North Carolina at 37.6 percent under Scenario 2D. The smallest federal share would be 29.3 percent for Washington under scenario 2D, which is still significantly higher than the 20.9 percent for Arizona. In each case the entire impact in the other states is felt at the state level with no change in local share from that generated in Scenario 1.

For two states (Arizona and Pennsylvania) the federal share under Scenario 2D approximates the federal share under the existing conditions. That is, in each of these states the federal-aid received during the five-year study period was approximately equivalent to the total expenditures on their respective interstate and rural principal arterial systems. Equivalent roadway mileage is 2,364 miles for Arizona and 3,256 miles for Pennsylvania.

In North Carolina and Washington the federal share of total expenditures under Scenario 2D is still 4 and 10 percentage points respectively, below the existing federal share for the study period. This is not generally indicative of the position of these states relative to the donor/donee issue on the federal highway user revenue fund, as Washington is a donee and North Carolina is a donor.

Scenario 3 (A and B)

Under Scenario 3A the federal routes of interstate significance are assumed to include 100 percent of the interstate system, 50 percent of the rural principal arterial system, and 50 percent of the urban freeway and expressway system for each state. For Scenario 3B, 100 percent of each of the interstate, rural principal arterial, and urban freeways and expressway systems are included.

For Arizona, Scenario 3A results in a 20.6 percent federal share of expenditures for approximately 1,769 miles of roadway. This is nearly equivalent to the federal share for the existing conditions. The major impact of this scenario also appears to be at the state level.

The impact of Scenario 3A on each of the other states is consistent with the results in Arizona. This scenario results in a relatively large shift in expenditures

from the state to the federal level with no impact on local responsibility. Washington has the highest level of federal share at 33.1 percent.

Scenario 3B transfers the greatest number of roadway miles to federal responsibility and results in the highest level of federal participation for each state. In Arizona this scenario results in a 25.2 percent federal share of expenditures, which exceeds the existing condition by approximately 4 percentage points. This is, however, the lowest federal share by a significant margin for any of the states studied.

The federal share under Scenario 3B is 39.9 percent, 35.3 percent and 38.8 percent respectively for North Carolina, Pennsylvania, and Washington. In Pennsylvania, as in Arizona, this value exceeds the existing share of federal expenditures. In North Carolina and Washington the federal share is slightly less than that in the existing condition.

GENERAL CONCLUSIONS

There is a differential impact of the redistribution scenarios on the states evaluated that is related not only to the current level of federal funding, but also to the relationship between the state and local governments. Arizona and Washington, which pass back the highest percent of state revenues to local governments, show the highest share of expenditures at the local level. North Carolina and Pennsylvania, which pass back the lowest percent of state revenues to local governments, show the highest share of expenditures at the state level. State plus local expenditures represent the highest share of the total for Arizona, which conversely indicates the lowest federal share of any state at approximately 21.5 percent.

The pass back of state revenues is indicative of the current distribution of responsibility for highway systems. In North Carolina and Pennsylvania nearly all of the rural highway systems are state-maintained. In North Carolina the majority of urban expenditures--including urban collector classification--are made by the state. In Pennsylvania there were no local jurisdiction expenditures on any roadway above the rural minor collector classification or the urban collector classification. In contrast, Arizona local jurisidictions have contributed significant expenditures to all

roadway classes except the interstates, and in Washington the local jurisidictions contribute to all roadway classes up through minor arterials.

If the miles of local roadway are excluded, Scenario 2D indicates that the current levels of federal-aid to Arizona represents an amount equivalent to the expenditures required on approximately 15 percent of the remaining highway system. In Pennsylvania this equivalency from Scenario 2D represents 9.3 percent of the highway system excluding local roadways. The higher share of federal expenditures in North Carolina and Washington would be equivalent to 9.5 percent and 11.6 percent of the respective highway systems in these states under Scenario 3B.

In general, under the hypothesized redistribution scenarios, the state share of expenditures appears to decrease and the local share appears to increase. This could require redefining the state and local relationship with regard to state revenues.

The state plus local share of expenditures are the highest for Arizona for each of the scenarios. The state plus local share for North Carolina and Pennsylvania were approximately the same for each of the scenarios. The state plus local share for Washington was similar to that for North Carolina and Pennsylvania, but was in general slightly lower. There are some slight variations in the relative state plus local share between states for a given scenario, which appears related to the number of miles of roadway involved.

Future Impacts

The impacts of any of the redistribution scenarios developed in this study would be dependent on the future development needs of each state with respect to the specific roadway functional classifications. For example, if a jurisdiction anticipated development needs for new urban principal arterials in an amount that was disproportionately higher than that inherent in the data used for this study, then this could significantly alter the distribution of expenditures from that calculated. If future interstate development was to be more or less than that inherent in the data, this could also significantly affect the results.

Without a needs projection for each state disaggregated by roadway functional class, it is not possible to evaluate the future impacts of a given scenario. Typical

needs studies do not present roadway needs by functional class. Revenue projections cannot be used to evaluate these impacts because they are unrelated to the development needs for a given roadway type.

Cost Savings

A common statement heard around the halls of state and local government offices for years has been: "If only the Federal Government wasn't involved, we could build this project cheaper." The truth or falsity of this statement is very relevant to the research being undertaken in this project. However, it was found that sufficient data to provide analytical proof to this hypothesis were not available. Therefore, it was necessary to attempt to address this issue using a subjective rather than an analytical approach.

A number of individual discussions were held with ADOT, Maricopa County, and City of Phoenix personnel to discuss cost savings when federal-aid is not involved in a project. This was followed by a meeting with representatives from the FHWA, the City of Phoenix, Maricopa County, the Arizona Transportation Research Center, and the Right-of-Way, Transportation Planning, and Environmental Planning sections of ADOT. The discussion centered around the following questions:

1. Does high level of federal money for construction distort state and local level decision making?

2. Would elimination of federal red tape save money?

3. Do higher standards established by federal policies have other associated benefits, e.g., safety, liability, operations?

4. Without federal involvement at state and local level, what types of requirements, programs, policies, or procedures could be eliminated?

Based upon the discussions, minimum and maximum potential saving resulting from shifting funding responsibility from federal-aid to the state or local government were estimated. It must be emphasized again that these estimates are not based upon hard technical data but rather on the experience and knowledge of the participants in this process. Discussions and saving estimates are presented by the analysis expense categories as they are reported on FHWA Form 534.

Right-of-Way

The State of Arizona follows the same relocation procedures for either a federal or state project. Some states follow separate procedures which result in some savings. It is estimated that a savings range of 0 to 20 percent on right-of-way costs might result in a particular project being built with state rather than federal funds.

Local governments also follow similar right-of-way procedures with or without federal funding, although on locally funded jobs construction is allowed to start prior to full right-of-way acquisition. It is estimated that a 5 to 20 percent right-of-way savings might be realized for locally funded jobs.

Preliminary Engineering

At the state level, preliminary engineering is identical for either a federal or state-funded job. However, at the local level, the Design Concept Report and subsequent review results in additional costs estimated at 10 to 30 percent. At the local level, an additional year is programmed to allow for the preparation and review of the Concept Report.

It was a concensus of all who participated in this project that the threat of liability has brought all projects--regardless of funding source--into basic conformance on design standards. The two bibles of the profession: the AASHTO "green book" and the Manual on Uniform Traffic Control Devices are used for guideline standards on all local, state, and federal projects. While there may be some slight interpretative differences, these documents are generally followed.

Construction and Reconstruction

The major difference between federal and state funded construction and reconstruction costs is the requirement of the Davis-Bacon Act to impose wage rates for workers on federal projects. This could result in an increase of as much as 20 percent in construction costs. In addition to the Davis-Bacon Act, local jobs also have increased construction administration and inspection costs required on a federal-aid job. Thus, a local job construction or reconstruction savings might range from 5 to 30 percent.

Bridges

Bridges would be similar, although probably have less savings involved than would construction and reconstruction--0 to 5 percent state, 0 to 10 percent local.

Safety/Traffic

There is probably very little difference between federal and state or locally funded jobs in safety and traffic control. For analysis purposes, it is estimated as no change at the state level and 0 to 5 percent at the local level.

Environmental

The environmental process, similar to the liability concerns during preliminary engineering, is being driven by the threat of environmental-related lawsuits holding up or stopping projects. Thus the issues and depth of study are very similar in either federal or state-funded projects. However, state projects require only an Environmental Assessment while similar federal projects would require a more in-depth Environmental Impact Statement. Federal projects may also require a 4(f) Statement. This additional study plus considerably more review time could increase the environmental study costs from 10 to 40 percent. For similar reasons, local federal project environmental costs could be reduced by 10 to 50 percent using local rather than federal money.

Maintenance

No differences are perceived in maintenance costs for federal, state, or locally funded projects.

Aggregate Saving

To estimate potential cost savings which could be attributed to transferring federal projects to state or local funding, the ranges of savings estimated in the previous discussions were applied to redistribution Scenario 1 as described in Table 2-12, i.e., the Federal Government funds the interstate system, state and local governments fund the rest. Remembering that the cost saving reductions were

subjectively obtained, a cost saving in the range of 0 to 8 percent is estimated for state projects and 1 to 7 percent is estimated for local projects. This is possibly less than what might have been anticipated. However, the savings are computed on the difference between the 21.5 percent federal contribution today (see Table 3-7) and the 16.0 percent federal contribution estimated under redistribution Scenario 1 (see Table 3-13). The savings will vary by scenario, but--on the aggregate--would be in the range estimated.

In addition to the project costs, there would probably be some administrative savings if the Federal Government dealt strictly with the interstate system. It is possible that some data reporting forms could be eliminated resulting in the reduction of a few staff positions at the state level, or that the number of financial personnel who deal with federal-aid might be reduced. However, major personnel cuts, like the elimination of the federally-mandated Councils of Government, would probably not happen because they are so entrenched into the system. Compared to the hundreds of millions of dollars spent on design and construction, the personnel cuts would seem to be minimal.

Potential Changes in Revenue Structure and Distribution

The general trend indicated by the redistribution scenarios is that the Federal Government would assume less of a proportion of the total roadway cost. Hence, the state and local share would increase. The change at the state and local level is primarily dependent on the existing relationship between the state and local governments with regard to roadway responsibility. For example, in North Carolina and Pennsylvania, where the state government is responsible for most of the roadway system except that classified as local, the impacts of the redistribution scenarios are primarily at the state level. However, in Arizona and Washington, where the local government's share of expenses for collector and arterial roadways is substantial, the local government's share of costs would appear to increase significantly as a result of the redistribution, while the state share decreases or increases only slightly. Therefore, the need for revenue, or a change in the revenue distribution or tax structure at the state and local level, is largely dependent on the existing relationship between state and local governments.

In general the federal expenses would appear to decline. Therefore, it could be argued that the federal highway tax revenues could be reduced. However, the Federal Government is not currently structured to administer the operation and maintenance of a highway system on a national basis. The operation and maintenance of the highway system would require that the Federal Government either increase its manpower or purchase these services from existing public agencies or private companies. This could alter the cost to the Federal Government and negate the potential decrease in federal taxes under several of the redistribution scenarios. If the Federal Government were to concentrate solely on the interstate system--as suggested by Scenario 1--then a reduction in the federal highway taxes would appear consistent with the significant reduction in federal expenditures.

Increases in state and local revenue would appear necessary as a result of the elimination of federal-aid and the redistribution of responsibilities. Fuel taxes, bonds, sales taxes, or other mechanisms are typically used by state and local governments to generate revenues for highway expenses. These, and perhaps other mechanisms, would be required to offset the reduction in revenue from the federal tax. The redistribution of state revenues to local governments would also be required in those states where the local share of total costs increased.

4. LEGAL REQUIREMENTS

This chapter discusses the major changes that would be required in federal and state laws in order to implement the funding redistribution schemes described earlier in this report. Another objective of this chapter is to present, as simply as possible, a description of the current federal and state highway financing programs, in order to provide a basis for the discussion of changes that are needed in the laws on which the programs are based. Therefore, discussions are presented on the federal, state, and local highway financing requirements, followed by discussions of the respective legal constraints.

FEDERAL-AID HIGHWAY PROGRAM

The basic components of the federal-aid highway program involve the federal-aid system, the Highway Trust Fund, and the apportionment formulas for each functional classification in the federal-aid system.

There are four federal-aid systems: Interstate, Primary, Secondary, and Urban. The functional classification of routes is the basis for placing routes on one of the federal-aid systems. Functional classification is concerned with three broad types of routes: arterial roads, collector roads, and local roads.

Since 1956, funding for the federal-aid highway program has come from the Highway Trust Fund. This fund is made up of tax revenues. Table 4-1, excerpted from an ADOT booklet entitled, "Highway Financing in Arizona," shows the user fees which make up this fund. This text describes the apportionment system:

> "Federal-aid apportionments to the states begin with authorizing legislation. The legislation set the upper limits on liabilities that can be incurred for federal-aid highways. After deductions for program administration and urban transportation planning, the remaining amounts are apportioned or allocated to the states. Sums are authorized for the various federal-aid program categories and apportioned based on formulas prescribed by law.
>
> A few examples of the formulas used to apportion or allocate federal-aid highway fund authorizations among the states are:
>
> - o Urban System Funds - apportioned to each state according to its percentage of the nation's urban population.

- o Interstate System - apportioned to each state based on the state's relative share of the cost to complete the system.

- o Interstate 4R - apportioned to each state based on the state's relative share of lane miles and vehicle miles of travel on the interstate system.

New appropriations are made with the passage of each new federal-aid highway program bill which is passed into law by Congress."

TABLE 4-1. FEDERAL HIGHWAY-USER FEES

Type of User Fee	Established Rate as of 1986
Gasoline	9 cents/gallon
Gasohol	3 cents/gallon
Diesel Fuel	15 cents/gallon
Other Special Fuels	9 cents/gallon
Tires	For 00-40 lbs., no tax For 40-70 lbs., 15 cents/lb. in excess of 40 lbs. For 70-90 lbs., $4.50 + 3 cents/lb. in excess of 70 lbs. Over 90 lbs., $10.50 + 50 cents/lb. in excess of 90 lbs.
Truck and Trailer Sales	12% of retailer's sales price for trucks over 33K lbs. gross vehicle weight (gvw) and trailers over 26K gvw
Heavy Vehicle Use	Annual tax: Trucks 55K lbs. gvw to 75K lbs. gvw, $100 plus $22 for each 1,000 lbs. (or fraction thereof) in excess of 55K lbs. Over 75K lbs. gvw = $550/yr.

Source: Highway Financing in Arizona, ADOT

The text quoted above also points out that although authorizations are typically enacted on a multi-year basis, Congress has the authority to place annual limitations on the amount of obligations that can be incurred in a single year.

Therefore, the money appropriated for highway projects is not always available to the extent anticipated.

The largest portion of federal assistance for highways--about 80 percent of the total federal funds authorized--is distributed to states for construction, reconstruction, and improvement of roads on the federal-aid systems. The funds are made available through the following programs:

- Interstate
- Interstate 4R
- Primary
- Secondary
- Urban

These programs, and special purpose programs, are described in more detail as follows.

Interstate Program

The Interstate program is the largest federal-aid highway program--in terms of funding. The federal share of these costs is 90 percent of the project's cost. This program provides funds for design, right-of-way acquisition, and construction of the interstate system.

Interstate 4R Program

The Interstate 4R program provides funds for resurfacing, restoring, rehabilitating, and reconstructing the interstate system. The 4R program provides for a much broader range of eligible activities and the federal share is 90 percent.

Primary Program

Primary routes, which are rural arterials and their extensions through urban areas, are chosen by the states with the approval of the Secretary of Transportation. The routes are owned and maintained by the states in most cases, or by local units of government.

The federal share for Federal-Aid Primary projects is 75 percent. Although these funds may be used for all types of highway construction projects on the Primary System, a requirement is that at least 40 percent of the funds be spent on 4R-type projects on existing highways. It should be noted that the federal share may vary due to adjustments made for the amount of current federally owned acres in the state.

Secondary Program

Comprised originally of farm-to-market and feeder roads on state highways and county and local roads, and now including the more important intra-county routes, the Secondary System totals about 400,000 miles. The Secondary System cannot exceed the total mileage of rural major collector routes in each state. It consists of many locally owned and maintained routes, as well as minor state routes.

The federal share of the cost of projects is 75 percent. Although these funds may be used for all types of highway construction projects, a requirement is that at least 40 percent of the funds be spent on 4R-type projects on existing highways.

Urban Program

In 1970, a separate Federal-Aid Urban System was established as a network of supplementary roads to serve local urban transportation needs. Selection of the specific system sections in each urban area is made by local officials with the concurrence of the state highway or transportation agency. The federal share of project costs is 75 percent.

Urban System funds, in addition to the regular eligibilities of all federal-aid highway funds, may be used for the purchase of transit buses and rapid rail cars and for the construction, reconstruction, and improvement of fixed rail facilities. This broad use of highway funds is at the discretion of local and state officials. However, at least 40 percent of the funds must be spent on 4R-type projects. Further emphasizing the local nature of the Urban System program is the requirement that projects be selected by appropriate local officials (with the subsequent concurrence of the state). Under most other programs, projects are initiated by the state highway or transportation agency.

Special Purpose Programs

This section describes federal programs that are not tied to a specific type of roadway system. These programs are aimed at solving problems common to all roadway systems, and are summarized below.

Bridge Replacement and Rehabilitation Program

This program provides funds for the rehabilitation as well as replacement of deficient bridges. Funds may be applied to projects on all highway bridges on public roads, regardless of whether they are on or off a federal-aid system. (Between 15 and 35 percent of the regularly apportioned funds must be spent for off-system bridges.) The federal matching share is 80 percent of the eligible costs.

Highway Safety Program

Improved highway safety is the goal of several individual programs. One of these is the State and Community Highway Safety Program. The FHWA and the National Highway Traffic Safety Administration share responsibility for the program, and both provide states with federal funds for administering it. Aimed at making the driver, vehicle, and roadway safer, activities include driver education and licensing, periodic motor vehicle inspection, provision of emergency medical services, identification of accident locations, encouragement of safety belt usage, and improved highway design, construction, and maintenance practices.

Also under highway safety are the following programs relating to the physical safety aspects of roads and streets.

Hazard Elimination Program

This program has as its goals the correction of high hazard locations, the elimination of roadside obstacles which are a hazard to motorists or pedestrians, the improvement of signing and pavement marking, and the installation of traffic control or warning devices at high or potentially high accident locations. Projects may be on any public road other than a highway on the interstate system. The federal share is 90 percent.

Rail-Highway Crossings Program

This program is aimed at eliminating hazards at railroad-highway crossings both on and off the federal-aid system. Funds for the program may be used for warning devices such as signs, flashing lights, gates, or any type of work which reduces or eliminates the potential conflict between trains and highway vehicles. However, at least half the apportioned funds must be used for installation of protective devices at railway-highway crossings. The federal share is 90 percent.

Interstate Substitutions

This program provides funds for the substitute highway projects which result from decisions to withdraw Interstate routes and replace them with other types of federal-aid projects. Construction of all interstate and substitution projects were to have been underway by September 30, 1986. The FHWA representative should be contacted regarding the latest transfer and substitution policies.

LEGAL CHANGES THAT WOULD BE REQUIRED TO IMPLEMENT FUNDING REDISTRIBUTION TO FEDERAL PROGRAM

The changes in the funding apportionment formulas and the definition of the roadways which comprise the federal-aid system would require changes to Title 23 of the United States Code. This title defines the federal-aid program requirements. Table 4-2 gives examples of federal eligibility requirements which would require changes under the scenarios discussed in this report. Changes to Title 23 would require an Act of Congress.

Another legal issue is the potential conflict between the funding authorizations currently approved by Congress through 1991, and the redistribution of funding hypothesized in this report. If the redistribution amounts conflict with the funding authorizations currently approved, the hypothesized programs could not begin until a new federal budget was approved.

Funds authorized by Congress can be subject to limitations on obligation per the Congressional Budget and Impoundment Control Act of 1974. While the limitations do not reduce apportionments to the states, they do restrict the total

TABLE 4-2. EXAMPLES OF FEDERAL-AID ELIGIBILITY REQUIREMENTS

Program	Eligibility Requirements	Change Required or No Change Under Proposed Funding Scenarios?
Urban Section 103 Title 23, U.S.C.	1. The project must be on an Urban System within a designated urban boundary.	Possible change required
	2. The Urban System must be selected by the appropriate local officials and approved by ADOT and FHWA.	Possible change required
	3. The comprehensive urban transportation planning process (Section 134) must be conducted in "urbanized" areas.	Possible change required
	4. The project must be sponsored by a county, city or town.	No change
	5. The project must be built to prevailing AASHTO design standards.	No change
	6. The project must be in the Council of Governments' approved Five-Year Construction Program.	No change
Rural Secondary Section 103 Title 23, U.S.C.	1. The project must be on a designated Rural Secondary route.	Possible change required
	2. The Secondary System must be selected by the appropriate local officials and approved by ADOT and FHWA.	Possible change required
	3. The project must be built to prevailing AASHTO design standards.	No change
	4. The project must be sponsored by a county, city or town not qualifying for urban designation.	Possible change required
	5. The project must be in the Council of Governments' approved Five-Year Construction Program.	No change
Bridge Replacement and Rehabilitation Program Section 144 Title 23, U.S.C.	1. The bridge must be on a road open to public travel.	No change
	2. The bridge must be inspected and inventoried in accordance with the National Bridge Inspection Standards.	No change

TABLE 4-2 EXAMPLES OF FEDERAL-AID ELIGIBILITY REQUIREMENTS (CONTINUED)

Program	Eligibility Requirements	Change Required or No Change Under Proposed Funding Scenarios?
	3. The bridge must be reported by ADOT as a candidate structure for replacement and/or rehabilitation to the FHWA. Only those candidate structures subsequently approved by the FHWA are eligible.	Possible change
	4. The bridge must be designed and constructed in accordance with the prevailing AASHTO bridge standards.	No change
	5. The project must be in the Council of Governments' approved Five-Year Construction Program.	No change
Rail-Highway Section 130 Title 23, U.S.C.	1. The project must be on a road open to public travel.	No change
	2. The sponsor must submit a detailed drawing of the proposed project.	No change
	3. The project must comply with the FHWA Manual on Uniform Traffic Control Devices.	No change
	4. The project must be sponsored by a County, City or Town.	No change
	5. The project must be in the Council of Governments' approved Five-Year Construction Program.	No change
Hazard Elimination Section 152 Title 23, U.S.C.	1. The project site must be on a road open to public travel.	No change
	2. The project must be cost effective.	No change
	3. The project must be sponsored by a county, city or town.	No change
	4. The project must be reviewed by ADOT to establish eligibility for federal funding.	Possible change
	5. The project must be in the Council of Governments' approved Five-Year Construction Program.	No change

obligations that can be incurred in a given year. It is not clear as to whether this Act would require revisions if a funding redistribution was instituted. Arizona Revised Statutes regarding definitions of federal and state responsibilities for designated roadways would need revisions. An example of this type of statute is A.R.S. § 28-1867, which discusses how to designate county Federal-Aid Secondary highways. In this example, Subsection C would require revisions, under some of the proposed funding scenarios. This statute is quoted as follows:

A. Upon petition of the board of supervisors of a county, the board shall, if it decides that the public convenience is served and the designation will not interfere with the completion and upkeep of the present county highway system, submit to the FHWA a request that the road be placed on the county Federal-Aid Secondary system.

B. Federal-Aid Secondary county highways shall be ordered constructed, improved, repaired and maintained by the county with the department acting as agent for the counties for the receipt of federal-aid funds.

C. The costs of construction, improvement, repair and maintenance of Federal-Aid Secondary state highways shall be borne by the department.

D. Matching funds for any county Federal-Aid Secondary project shall be the responsibility of the county and matching funds for state Federal-Aid Secondary projects shall be the responsibility of the department.

E. Any rural road in the state may be designated a Federal-Aid Secondary road by approval of the board with the concurrence of the FHWA.

F. "Secondary roads" as used in this section means roads having secondary order of significance to primary roads which connect centers of population."

STATE OF ARIZONA FUNDING PROGRAMS

One of the main funding sources for Arizona highway projects is the Arizona Highway User Revenue Fund (HURF). This fund is made up of highway revenues such as fuel tax revenues, motor carrier taxes, vehicle registration and licensing fees, auto-related sales taxes, and other sources such as administrative fees, auto

dealer and wrecker fees, abandoned vehicle sales tax, etc. The HURF funds are currently distributed as follows: 50 percent to the State Highway Fund, 30 percent to cities and towns, and 20 percent to counties. Phoenix and Tucson receive 7 percent of the state's 50 percent portion each year. Maricopa and Pima Counties are assured that the state will spend 15 percent of its 50 percent on access-controlled roads in these counties. Both the sources of the HURF and the percentage distributions are mandated by the Arizona Revised Statues.

Approximately half of the HURF funds described above are allocated to the State Highway Fund. This fund is used to construct and maintain the state highway system. The main sources of the State Highway Fund are the HURF distribution, federal-aid, the three cent fuel tax, the vehicle license tax, and other sources (primarily investment interest).

The three cent fuel tax was enacted by the State Legislature and became effective in January, 1986. The distribution of this tax is 64 percent to the State Highway Fund and 36 percent to local governments.

The issuance of bonds is another funding option authorized by statute. The State Transportation Board is allowed to issue public bonds for transportation when deemed necessary.

STATUTORY CHANGES THAT WOULD BE REQUIRED TO IMPLEMENT FUNDING REDISTRIBUTION

All of the state funding sources and distributions are defined by statute. Changes in the funding levels required by the state to construct and maintain highway projects may require changes to the state funding sources and distribution.

LOCAL HIGHWAY FUNDING PROGRAMS

Property Tax Revenues

Once the board of supervisors has established a roadway, it may levy a real and personal property tax, not exceeding twenty-five cents per one hundred dollars of property, for road purposes. In counties having an assessed valuation of two hundred million dollars or over, a tax not to exceed twenty-five cents per one

hundred dollars of assessed valuation may be levied in lieu of the above noted tax rate.

County Transportation Excise Tax

Counties may levy a transportation excise tax if approved by voters. There are variations in the plans based on the population of the county, i.e., the three categories are counties over 1.2 million population, counties between 400,000 and 1.2 million persons, and counties under 400,000 persons. In the largest population categories, the funds may be used for the design, right-of-way purchase or construction of controlled access highways which are included in the regional transportation plan of the county and which are accepted into the state highway system.

Also, a certain amount of funds collected from this tax are earmarked for the planning, preliminary engineering, and design necessary to develop a regional public transportation system plan.

Other planning obligations include the listing of transportation corridors by priority in the regional transportation plan. The regional transportation plan may also provide a suggested construction schedule for the corridors. Another aspect of this tax is that bonds may be issued against the anticipated revenue from this tax, if required.

A regional public transportation authority must be established. This authority administers the public transportation fund and establishes and operates a regional bus system.

For counties with a population between 400,000 and 1.2 million, the transportation excise tax may also be used for the design, right-of-way purchase, construction, standard and reduced clearance grade separation, extension and widening of arterial streets and highways included in the regional transportation plan, in addition to the use of funds for the construction of controlled access highways and related grade separations which are included in the regional transportation plan. Therefore, medium-sized counties have a greater flexibility in the type of roadways that can be improved.

As in counties of over 1.2 million population, a regional public transportation authority must be established. Also, the county, through their regional planning agency, shall list transportation corridors by priority in the regional transportation plan. This plan must be updated annually.

In counties with a population of less than 400,000 persons, A.R.S. § 42-1484 describes the revenue distribution procedure:

> "The net revenues collected under this section shall be distributed to the individual county and to the individual cities and towns in the county in the manner determined by the county board of supervisors prior to the election and described in the publicity pamphlet for the election. The revenues distributed to each jurisdiction may only be used in a manner consistent with the use of revenues distributed from the Arizona Highway User Revenue Fund under § 28-1598."

OTHER SOURCES

As described in the previous section, a portion of the HURF funds and three cent fuel tax are also allocated to local governments.

LEGAL CHANGES THAT WOULD BE REQUIRED TO IMPLEMENT FUNDING REDISTRIBUTION

To change the level of local funding required for transportation improvements would require changing the Arizona Revised Statutes and would require local action on the part of the county board of supervisors or city or municipal government if tax changes are required.

APPENDIX A

MISSING DATA ESTIMATION PROCEDURES

The basic data requirements for this study consisted of highway expenditures for state and local governments in Arizona, Pennsylvania, North Carolina, and Washington. It was necessary that these data be stratified by roadway functional class (see Table A-1) and highway expenditure category. It was also necessary that the level of federal funding within the state and local expenditures be capable of estimation.

TABLE A-1. HIGHWAY FUNCTIONAL CLASSIFICATIONS

Rural	Urban
Interstate	Interstate
Other Principal Arterial	Other Freeway and Expressway
Minor Arterial	Other Principal Arterial
Major Collector	Minor Arterial
Minor Collector	Collector
Local	Local

Data for this study were available from three sources: ADOT, FHWA, and the FHWA annual publication entitled Highway Statistics. Table A-2 summarizes the data sources used in this study and the data obtained from each source. For Arizona, the state and local jurisdiction data were obtained from ADOT as reported on FHWA Form 534 (see Figure A-1) and Arizona State Form 76-4101 (see Figure A-2). Data for the other states in the study were obtained from FHWA Form 534--filed annually by each state--and from local government information published annually in Highway Statistics (see Tables A-3 and A-4).

TABLE A-2. DATA SOURCES FOR ROUTES OF INTERSTATE SIGNIFICANCE

State(s)	Jursidiction	Source	Form
Arizona	State	ADOT	Federal Form 534
	Local (all functional classes)	ADOT	Arizona Form 76-4101
Pennsylvania, North Carolina, and Washington	State	FHWA	Federal Form 534
	Local (all functional classes combined total)	FHWA/ Highway Statistics	Federal Form 536 as reported in Highway Statistics
	Local (functional classes--collector and above)	FHWA	Federal Form 534

Every effort was made to obtain the most complete and reliable data available for the five-year study period (1981-1985). However, not all data were available for all jurisdictions and all study years. Table A-5 summarizes the general level of data availability for each of the study states. Approximately 80 percent of the data requirements were available and considered as known quantities. The remainder of the data were estimated by various means, depending on the quantity and source of the known data.

It was recognized that local jurisdiction reporting of data for Pennsylvania, North Carolina, and Washington may have been incomplete. Contacts with Department of Transportation staff in each of these states did indicate less than 100 percent reporting of expenditure data by local jurisdictions. However, the current level of reporting and reliability of the data was deemed more than adequate for the comparative analysis in this study. No effort was made to estimate missing data at the local level for these states because data by jurisdiction were not available.

Extensive effort was made to establish a database for Arizona that was as complete as possible. Data were available from ADOT for most local jurisdictions, but this was also incomplete. The procedures used to estimate the missing data required for this study are detailed in the following sections.

FHWA NOTICE N 5600.3
January 24, 1986

FORM APPROVED
OMB No. 2125-0012
Exp. 7-31-87

US Department of Transportation
Federal Highway Administration

HIGHWAY CAPITAL OUTLAY AND MAINTENANCE EXPENDITURES

(Classified by Functional and Federal-aid System)
In Dollars

FILE CODE	1 4	
	1 2	3
STATE		
	4	5
CALENDAR YEAR		
	6	7
SYSTEM CLASSIFICATION		
	8 9	10

IMPROVEMENTS GROUPED 11	LINE NO. 15-16	CAPITAL OUTLAY	FEDERAL-AID SYSTEM: FEDERAL-AID PROJECT 17-26	FEDERAL-AID SYSTEM: NON-FEDERAL-AID PROJECT 27-36	NON-FEDERAL-AID SYSTEM 37-46	TOTAL 47-56
	50	RIGHT-OF-WAY COSTS				
	00	ENGINEERING COSTS				
		CONSTRUCTION BY IMPROVEMENT TYPE				
	01	NEW CONSTRUCTION				
	02	RELOCATION				
	03	RECONSTRUCTION				
	04	MAJOR WIDENING				
	05	MINOR WIDENING				
	06	RESTORATION AND REHABILITATION				
	07	RESURFACING				
	08	NEW BRIDGE				
	09	BRIDGE REPLACEMENT				
	10	MAJOR BRIDGE REHABILITATION				
	11	MINOR BRIDGE REHABILITATION				
	12	SAFETY/TRAFFIC OPERATIONS/TSM				
	13	ENVIRONMENTALLY RELATED				
	14	TOTAL CAPITAL OUTLAY (Lines 50 to 13)				
		MAINTENANCE COSTS				TOTAL
	15	PHYSICAL MAINTENANCE		(optional)	(optional)	
	17	TRAFFIC SERVICES		(optional)	(optional)	
	22	TOTAL MAINTENANCE COSTS		(optional)	(optional)	

FORM FHWA-534
(Rev. 4-85)

PREVIOUS EDITIONS OBSOLETE.

FIGURE A-1. FEDERAL HIGHWAY ADMINSITRATION FORM 534

† ● 76-4101 7/81

ARIZONA DEPARTMENT OF TRANSPORTATION
TRAVEL AND FACILITIES

COUNTY/CITY PHOENIX

YEAR ENDED JUNE 30, 1986

CAPITAL OUTLAY AND MAINTENANCE EXPENDITURES BY FUNCTIONAL CLASS AND SYSTEM

* TOTAL ITEM II.A.1, FORM 76-4102 7/81
** TOTAL ITEM II.A.2, FORM 76-4102 7/81

			RURAL					URBAN				
	CAPITAL OUTLAY	SYSTEM TYPE	PRINCIPAL ARTERIAL	MINOR ARTERIAL	MAJOR COLLECTOR	MINOR COLLECTOR	LOCAL	PRINCIPAL ARTERIAL	MINOR ARTERIAL	COLLECTOR	LOCAL	TOTAL
01	Cost of Acquiring Right of Way	F.A.						28,123,295				
		N.F.A.								27,388	68,503	28,219,186
02	Preliminary/Const. Engineering	F.A.						9,695,741				
		N.F.A.						339,497		679,053	991,778	11,706,069
03	New Route	F.A.										
		N.F.A.						3,913,400		1,419,768	7,634,676	12,967,844
04	Relocation	F.A.										
		N.F.A.										
05	Reconstruction	F.A.						23,393,262				
		N.F.A.						1,048,024		1,588,708	2,300,325	28,330,319
06	Major Widening	F.A.										
		N.F.A.										
07	Minor Widening	F.A.										
		N.F.A.										
08	Restoration and Rehabilitation	F.A.										
		N.F.A.										
09	Resurfacing	F.A.										
		N.F.A.						1,557,713		1,106,796	1,434,736	4,099,245
10	Bridge Replacement	F.A.						72,701				
		N.F.A.						1,953,295				2,025,996
11	Bridge Rehabilitation	F.A.										
		N.F.A.										
12	Safety/Traffic Operations/TSM	F.A.										
		N.F.A.						574,812		30,253		605,065
13	Environmentally Related	F.A.										
		N.F.A.										
14	Total Capital Outlay	F.A.										
		N.F.A.						70,671,740		4,851,966	12,430,018	87,953,724
	MAINTENANCE COSTS											
15	Maintenance of Condition/Roads							5,113,792		1,340,488	3,929,053	10,383,333
16	Maintenance of Condition/Bridges											
17	Snow and Ice Removal											
18	Traffic Control/Safety Facilities							4,943,890		1,186,324	1,778,609	7,908,823
19	Unusual or Disaster Maintenance											
20	Total Maintenance Costs							10,057,682		2,526,812	5,707,662	18,292,156

FIGURE A-2. SAMPLE OF LOCAL EXPENDITURE DATA REPORTED TO ADOT

TABLE A-3. DISBURSEMENTS BY MUNICIPALITIES FOR HIGHWAYS - 1984

COMPILED FROM REPORTS OF STATE AND LOCAL GOVERNMENTS

(THOUSANDS OF DOLLARS)

TABLE UF-2
SEPTEMBER 1986

STATE	CAPITAL OUTLAY				MAINTENANCE			TRAFFIC POLICE 1/	ADMINISTRATION AND MISCELLANEOUS	INTEREST 2/	SUBTOTAL CURRENT DISBURSEMENTS	DEBT RETIREMENT 2/	TRANSFERS TO		NON-HIGHWAY	TOTAL
	RIGHT-OF-WAY 2/	ENGINEERING 3/	CONSTRUCTION	TOTAL	ROADS AND BRIDGES	SNOW REMOVAL	TOTAL						STATE GOVERNMENTS	LOCAL GOVERNMENTS		
ALABAMA	400	2,766	42,510	45,676	86,386	-	86,386	1,027	3,710	12,448	150,242	67,776	182	-	-	218,199
ALASKA	171	8,749	65,747	74,667	18,337	9,243	30,880	11,484	5,807	7,117	118,628	4,855	-	-	-	124,184
ARIZONA 4/	3,588	5,234	160,641	169,463	31,908	1,550	33,398	22,107	5,360	12,802	266,830	9,812	2,782	-	-	279,124
ARKANSAS 4/	207	1,073	15,685	17,765	41,964	-	41,964	2,567	5,085	696	68,057	12	561	-	-	68,630
CALIFORNIA	24,589	28,536	379,124	432,249	848,020	465	848,485	184,183	98,685	19,837	1,290,109	25,874	56,139	1,366	-	1,373,188
COLORADO	2,709	9,198	72,313	88,217	92,685	23,236	78,921	36,473	10,189	11,070	210,840	26,424	11,212	478	-	256,954
CONNECTICUT 4/	-	292	5,931	6,183	98,481	10,942	109,423	2,212	10,029	1,233	129,070	812	-	-	-	129,882
DELAWARE 4/	-	16	200	216	8,219	542	8,761	4,322	245	5,230	11,774	1,440	-	-	-	13,214
FLORIDA 4/	1,117	4,639	61,872	67,325	183,358	-	183,358	99,081	2,422	6,220	259,206	1,917	7,728	-	-	268,848
GEORGIA	49	1,422	22,080	23,529	64,618	-	64,618	10,918	7,881	1,492	116,138	2,791	-	-	-	118,926
HAWAII 2/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IDAHO	57	201	2,919	3,177	11,719	775	12,492	665	3,083	147	19,564	396	-	65	-	20,025
ILLINOIS 4/	1,778	12,134	88,583	82,499	230,730	13,639	244,369	64,636	21,828	8,608	432,136	2,194	9,985	-	-	444,315
INDIANA	1,300	4,323	42,325	48,948	61,737	4,624	66,361	18,794	8,828	4,497	147,442	2,440	3,914	-	-	153,796
IOWA	1,769	6,682	62,670	71,121	67,422	8,721	76,143	12,850	8,195	19,818	187,867	32,249	1,667	-	-	221,783
KANSAS 4/	-	3,112	32,871	35,683	48,788	245	49,003	10,795	1,881	13,305	110,717	8,421	6,477	-	-	122,615
KENTUCKY 4/	6	1,266	12,778	14,048	22,842	905	23,847	21,928	2,682	524	62,956	137	1,078	19	-	64,230
LOUISIANA	46	14,096	122,379	136,519	79,284	-	79,284	47,976	10,160	26,077	299,826	12,672	-	-	-	312,498
MAINE	-	867	11,517	12,384	17,488	16,244	33,733	2,142	3,846	1,502	52,307	2,868	763	-	-	55,638
MARYLAND 4/	5,401	15,398	155,696	176,498	85,316	3,062	88,378	6,986	7,373	7,905	287,107	476	-	-	293	287,876
MASSACHUSETTS	593	2,521	17,777	20,891	102,289	28,834	132,119	45,436	27,164	1,303	227,913	14,882	537	68	-	243,397
MICHIGAN 4/	-	7,280	69,710	76,990	117,062	13,321	131,213	109,260	11,680	4,050	333,193	3,021	2,968	1,630	-	340,812
MINNESOTA	-	9,723	167,377	177,100	117,013	16,244	133,257	41,929	24,321	21,743	408,350	62,455	3,763	-	-	474,572
MISSISSIPPI 4/	410	1,616	16,196	18,424	41,849	-	41,849	1,782	891	8,078	67,698	475	3,445	-	-	71,619
MISSOURI 4/	278	1,637	35,977	37,892	100,697	1,076	101,773	1,081	2,477	4,339	147,562	2,765	4,240	-	-	154,567
MONTANA	102	336	1,025	1,463	7,082	87	7,169	2,380	693	484	12,959	5,296	-	-	-	18,255
NEBRASKA	46	4,852	50,900	55,499	32,914	4,472	38,386	9,782	7,178	13,238	124,076	24,018	9,789	21	-	133,871
NEVADA 4/	-	1,389	14,007	15,392	9,868	-	9,868	3,592	1,850	312	30,414	10	-	-	-	30,424
NEW HAMPSHIRE 4/	-	420	6,077	6,497	8,466	8,320	16,786	2,820	2,872	728	29,403	9,675	2,710	-	-	41,788
NEW JERSEY 4/	-	8,327	110,640	118,967	184,138	24,401	208,539	42,489	26,121	10,245	406,360	91,307	-	-	-	497,667
NEW MEXICO 4/	-	597	8,482	9,079	13,234	-	13,234	7,847	3,535	1,264	35,059	573	-	-	-	35,632
NEW YORK 4/	-	24,069	294,352	318,421	422,671	67,551	490,222	82,739	82,066	87,003	1,060,481	145,865	-	196	237,550	1,464,062
NORTH CAROLINA	2,597	4,698	27,932	35,628	67,309	664	67,973	41,099	13,639	3,414	151,753	6,691	2,963	-	-	161,407
NORTH DAKOTA 4/	680	2,380	21,898	24,958	10,144	1,511	11,655	2,225	540	9,092	48,370	1,884	3,480	1,266	-	94,200
OHIO 4/	260	9,362	91,786	101,408	187,200	11,660	198,860	65,334	21,061	25,962	412,633	95,886	17,707	-	-	526,226
OKLAHOMA 4/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OREGON	1,416	4,487	22,845	28,748	31,379	821	32,200	16,058	10,463	5,815	93,301	21,177	2,344	1	-	116,823
PENNSYLVANIA	-	3,471	38,091	38,562	141,287	13,817	155,104	207,968	44,139	6,678	482,449	22,423	8,242	-	-	481,120
RHODE ISLAND	1	648	6,554	7,203	7,858	3,276	10,834	5,100	2,219	899	26,251	438	-	-	-	26,689
SOUTH CAROLINA 4/	67	206	2,429	2,702	9,238	36	9,271	18,810	1,661	293	32,737	280	357	-	-	33,374
SOUTH DAKOTA	-	650	8,622	9,282	12,391	1,150	13,543	11,018	2,618	1,364	27,831	2,170	-	-	-	40,001
TENNESSEE	-	2,136	28,382	30,518	58,711	2,446	61,157	11,891	4,886	8,847	114,300	11,072	3,010	-	-	128,382
TEXAS	16,626	47,138	249,442	313,203	262,366	-	262,366	362,314	42,738	112,928	1,093,807	88,954	10,881	259	4,353	1,198,354
UTAH	152	3,185	11,120	14,471	20,196	2,915	23,111	753	4,161	-	42,536	-	1,050	261	-	43,847
VERMONT 4/	-	137	2,020	2,157	6,503	1,372	7,875	36	528	28	10,621	330	-	-	-	10,951
VIRGINIA 4/	450	3,637	36,773	40,860	69,030	2,590	71,620	32,800	14,459	15,178	174,957	13,555	7,031	-	-	195,543
WASHINGTON	9,414	31,510	94,029	130,953	87,464	1,627	89,091	28,286	16,266	7,500	242,195	16,746	1,298	-	-	260,240
WEST VIRGINIA	65	768	8,195	9,018	30,066	227	30,293	4,039	1,962	462	46,274	339	793	-	-	47,406
WISCONSIN	-	21,647	98,734	120,381	100,741	11,193	111,934	187,316	24,621	29,043	473,295	41,271	7,887	-	-	522,453
WYOMING	426	2,583	20,664	23,673	10,485	2,017	12,502	8,612	7,106	410	52,703	6,391	1,862	-	-	60,856
TOTAL	73,170	322,263	2,918,179	3,313,612	3,921,933	342,901	4,264,834	1,934,790	634,689	841,500	10,689,395	908,429	192,916	9,627	242,196	12,038,163

1/ THIS TABLE RECORDS THE DISBURSEMENTS FOR ROAD AND STREET PURPOSES BY MUNICIPALITIES INCLUDING TOLL FACILITIES. SEE TABLE UF-1, NOTE 1 FOR ADDITIONAL INFORMATION ON LOCAL HIGHWAY FINANCE SERIES.

2/ IDENTIFIABLE DISBURSEMENTS FOR RIGHT-OF-WAY. IN SOME CASES, THESE EXPENDITURES MAY BE INCLUDED WITH CONSTRUCTION COSTS.

3/ ENGINEERING COSTS WERE ESTIMATED WHEN THE COMPLETE CLASSIFICATION OF EXPENDITURES WAS NOT AVAILABLE.

4/ TRAFFIC POLICE COSTS WHEN COMMINGLED WITH GENERAL POLICE ACTIVITIES ARE USUALLY NOT REPORTED. IN SOME INSTANCES, ESTIMATES WERE USED.

5/ INCLUDES PAYMENTS FOR LONG AND SHORT TERM DEBT. ALSO, THE INTEREST COLUMN INCLUDES SMALL CHARGES FOR ADMINISTRATION.

6/ ESTIMATED BY FHWA.

7/ DATA INCLUDED IN THE COUNTY AND TOWNSHIP HIGHWAY FINANCE SERIES.

8/ NOT ESTIMATED DUE TO INCOMPLETE HISTORICAL DATA.

Source: Highway Statistics, 1985

TABLE A-4. DISBURSEMENTS BY COUNTIES AND TOWNSHIPS FOR HIGHWAYS - 1984

COMPILED FROM REPORTS OF STATE AND LOCAL GOVERNMENTS

(THOUSANDS OF DOLLARS)

TABLE LF-2
SEPTEMBER 1986

STATE	CAPITAL OUTLAY				MAINTENANCE			TRAFFIC POLICE	ADMINISTRATION AND MISCELLANEOUS	INTEREST 4/	SUBTOTAL, CURRENT DISBURSEMENTS	DEBT RETIREMENT 4/	TRANSFERS TO		NON-HIGHWAY	TOTAL
	RIGHT-OF-WAY 2/	ENGINEERING 3/	CONSTRUCTION	TOTAL	ROADS AND BRIDGES	SNOW REMOVAL	TOTAL						STATE GOVERNMENTS	LOCAL GOVERNMENTS		
ALABAMA 5/ 6/	262	2,096	32,230	34,588	120,590	-	120,590	359	9,206	4,872	169,315	1,717	12,176	-	-	183,208
ALASKA	693	12,760	9,875	23,328	2,084	669	2,753	75	90	7,008	34,214	1,317	-	-	-	35,531
ARIZONA 6/	1,200	4,009	52,135	57,344	31,200	3,072	34,272	2,875	9,269	2,092	101,874	3,042	1,801	-	-	105,817
ARKANSAS 6/	229	1,232	32,934	34,395	37,508	-	37,508	918	18,160	-	90,996	-	1,922	8,599	-	101,475
CALIFORNIA	7,549	10,122	159,587	177,258	278,200	4,020	279,220	24,373	67,933	1,454	560,638	9,585	21,105	48,330	8,812	641,550
COLORADO	519	3,010	34,530	38,059	78,280	13,678	89,858	430	11,923	5,184	148,454	1,034	9,109	15,074	-	170,671
CONNECTICUT 5/	-	68	1,062	1,131	16,150	1,794	17,944	2,278	802	26	22,258	158	-	-	-	22,416
DELAWARE 5/ 6/	-	-	-	-	-	-	-	4,160	-	-	4,160	-	-	-	-	4,160
FLORIDA 6/	7,351	4,368	177,875	189,594	238,470	-	238,470	20,787	7,808	22,274	478,133	8,518	8,246	7,060	788	501,814
GEORGIA	2,179	3,039	45,368	50,586	111,654	-	111,654	8,903	11,232	3,121	185,496	8,060	-	-	-	187,556
HAWAII 6/	256	335	15,179	15,770	17,059	-	17,059	1,080	7,267	2,386	43,602	2,200	550	-	-	46,352
IDAHO	468	937	7,564	9,369	40,868	3,742	44,607	744	8,713	68	63,901	422	1,978	2,171	-	68,069
ILLINOIS 6/	2,284	22,079	99,803	123,866	212,330	5,701	219,031	94	20,924	1,301	373,216	9,909	10,844	-	18,000	408,669
INDIANA	2,629	6,872	65,724	74,925	88,888	12,256	98,144	2,034	8,630	687	184,417	23	7,598	411	-	192,453
IOWA	3,440	3,487	47,351	54,472	181,626	12,643	194,269	1,697	22,923	-	248,962	-	1,082	241	-	244,285
KANSAS 6/	59	2,968	39,317	43,324	100,478	-	100,478	1,818	1,668	4,757	151,782	1,249	8,118	3,340	-	164,456
KENTUCKY 6/	444	2,783	26,247	29,474	40,608	2,200	42,808	9,411	8,376	186	83,258	-	2,914	97	-	86,264
LOUISIANA	-	2,095	21,097	23,192	136,449	-	136,449	6,943	13,473	13,231	193,248	41,860	-	-	-	235,108
MAINE	-	184	1,863	2,047	10,701	13,809	24,510	1,092	2,198	31	29,838	180	4,007	-	-	34,032
MARYLAND 5/ 6/	1,657	3,322	42,477	47,456	68,602	8,688	72,287	16,142	15,463	16,728	170,277	6,747	91	1,659	-	178,774
MASSACHUSETTS	198	2,554	11,561	14,273	16,978	4,717	21,695	1,851	3,608	531	41,977	2,447	95	938	-	45,454
MICHIGAN 6/	-	3,082	40,940	44,022	341,014	30,888	371,902	7,934	18,657	6,503	449,019	8,966	1,338	1,918	-	459,241
MINNESOTA	6,388	9,627	143,886	159,901	155,995	21,089	177,084	20,938	26,077	2,290	388,960	4,385	11,463	8,165	-	418,973
MISSISSIPPI 6/	-	1,886	25,054	26,940	117,447	-	117,447	1,701	8,180	2,046	153,216	707	4,834	4,131	-	162,688
MISSOURI 6/	6	2,904	23,633	26,543	84,867	3,526	88,118	3,187	4,182	6,370	128,400	2,018	603	-	-	131,018
MONTANA	811	1,392	4,896	6,761	36,277	844	37,121	422	4,640	80	49,024	100	-	-	-	49,124
NEBRASKA	277	2,621	18,489	21,383	82,657	200	82,857	2,941	6,452	2,807	119,280	1,718	4,104	38	-	125,107
NEVADA	7,661	2,726	29,879	40,266	4,889	250	4,939	4,810	9,317	2,600	57,732	-	2,388	1,456	-	61,576
NEW HAMPSHIRE 6/	-	197	2,503	2,700	4,444	4,804	9,248	1,300	1,493	226	14,967	448	513	-	-	15,928
NEW JERSEY 6/	1,215	5,200	92,527	98,952	69,698	12,837	81,535	13,759	9,501	910	164,657	10,874	-	-	1,201	176,732
NEW MEXICO 6/	17	126	4,866	5,009	13,448	-	13,448	1,040	373	-	19,867	-	625	-	-	20,492
NEW YORK 6/	697	16,207	163,903	180,957	292,850	89,146	381,896	58,334	41,382	26,184	690,563	83,741	-	18,788	-	801,092
NORTH CAROLINA 5/	-	-	-	-	-	-	-	-	-	6	6	20	1,316	-	-	1,342
NORTH DAKOTA 6/	709	1,673	17,532	19,913	27,623	2,118	29,741	409	1,280	108	51,422	60	6,539	203	-	58,228
OHIO 6/	728	4,592	56,332	61,652	276,600	12,118	288,718	6,406	20,818	846	383,137	9,744	10,982	9,720	-	409,583
OKLAHOMA 7/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OREGON	1,324	7,757	34,284	43,365	88,763	2,250	90,013	6,001	11,761	616	129,798	1,209	1,728	1,788	-	134,484
PENNSYLVANIA	-	3,824	43,978	47,802	151,043	15,999	167,042	57,646	26,318	2,569	302,349	12,193	1,481	1,964	-	317,987
RHODE ISLAND	-	24	312	336	915	195	1,110	165	48	-	1,679	-	-	-	-	1,679
SOUTH CAROLINA 6/	15	321	6,649	6,991	28,684	7	28,681	1,906	2,852	114	37,124	643	374	629	-	38,770
SOUTH DAKOTA	7	945	12,948	13,900	37,763	2,707	40,470	1,262	1,179	-	56,412	-	2,060	975	-	59,347
TENNESSEE	193	1,944	17,861	19,998	81,657	3,403	85,078	69	6,207	2,261	112,988	8,068	3,693	-	3,150	124,896
TEXAS	3,267	16,492	128,432	148,192	243,608	-	243,608	9,098	72,384	42,444	515,726	48,918	9,960	-	-	570,604
UTAH	196	806	4,077	5,079	21,301	3,193	24,494	368	5,284	-	37,028	-	2,100	-	-	39,128
VERMONT 6/	18	356	7,147	7,521	21,951	6,849	28,700	75	1,867	99	38,264	50	-	-	-	38,314
VIRGINIA 5/ 6/	317	1,210	12,235	13,762	6,703	413	7,116	36,500	816	1,657	60,051	2,901	9,981	224	-	68,757
WASHINGTON	3,025	12,259	59,638	78,922	108,119	6,584	114,703	6,032	34,326	5,924	237,907	2,699	638	2,142	-	243,386
WEST VIRGINIA 5/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WISCONSIN	-	8,518	96,246	104,764	185,700	16,148	201,848	62,651	11,394	4,083	384,908	12,242	8,283	1,371	-	406,804
WYOMING	86	873	8,407	9,368	18,287	1,212	19,479	3,117	3,883	-	31,845	-	530	-	-	32,375
TOTAL	93,493	196,138	1,940,668	2,196,299	4,264,829	319,747	4,584,576	433,939	983,374	200,853	7,990,937	296,798	167,240	138,282	25,919	8,627,176

1/ THIS TABLE RECORDS DISBURSEMENTS FOR ROAD AND STREET PURPOSES, INCLUDING TOLL FACILITY DATA, BY COUNTY AND TOWNSHIP GOVERNMENTS. REFER TO TABLE LF-1, NOTE 1 FOR ADDITIONAL INFORMATION CONCERNING THE LOCAL HIGHWAY FINANCE SERIES.

2/ IDENTIFIABLE DISBURSEMENTS FOR RIGHT-OF-WAY. IN SOME CASES, THESE EXPENDITURES MAY BE INCLUDED WITH CONSTRUCTION COSTS.

3/ ENGINEERING COSTS WERE ESTIMATED WHEN THE COMPLETE CLASSIFICATION OF EXPENDITURES WAS NOT AVAILABLE.

4/ INCLUDES PAYMENTS FOR LONG AND SHORT TERM DEBT; INTEREST COLUMN ALSO INCLUDES SMALL CHARGES FOR DEBT ADMINISTRATION.

5/ COUNTY ROADS ARE UNDER STATE CONTROL IN DELAWARE (EXCEPT TRANSACTIONS UNDER PROVISIONS OF THE 1945 SUBURBAN COMMUNITY ROAD ACT), NORTH CAROLINA, WEST VIRGINIA, TEN COUNTIES IN ALABAMA, ALL BUT TWO COUNTIES IN VIRGINIA, AND IN MARYLAND THE STATE PERFORMS THE HIGHWAY FUNCTION IN SIX COUNTIES. DATA FOR THESE SYSTEMS ARE INCLUDED IN THE STATE HIGHWAY FINANCE SERIES.

6/ ESTIMATED BY FHWA.

7/ NOT ESTIMATED DUE TO INCOMPLETE HISTORICAL DATA.

Source: Highway Statistics, 1985

TABLE A-5. MATRIX OF AVAILABLE EXPENDITURE DATA

State	Form 534	1981	1982	1983	1984	1985
Arizona	State	N/A	X	X	X	X
	Local[a]	Y	Y	Y	Y	Y
North Carolina	State	X	X	X	X	X
	Local	X	X	X	N/A	N/A
Washington	State	X	X	X	X	X
	Local	X	X	X	X	
Pennsylvania	State	X	N/A	X	X	X
	Local	N/A	X	X	X	X

(a) Arizona local jurisdiction data obtained from ADOT records
X = Available
Y = Partially available, required some estimation
N/A = Not available, required estimation

ARIZONA LOCAL JURISDICTION DATA

The data given in Table A-6 represents the reported local jurisdiction expenditures for the years 1981 through 1986 obtained from ADOT records. A sample of the individual forms used to report this data is given in Figure A-2. The data are total local expenditures for all roadway functional classifications. The data in Table A-6 are stratified by cities/towns and counties. A total of 79 cities/towns and 15 counties are required to report expenditure data.

An element complicating the estimation of the missing data was the erratic reporting among the local jurisdictions. For example, Table A-7 indicates that only 19 of the 94 jurisdictions reported data for each of the six years. Seventy-six (81 percent) of the jurisdictions reported data for three or more years. Overall, 65.8 percent (371 values) of the possible quantities in Table A-6 were actually reported. Table A-8 indicates that as much as 82 percent and as little as 49 percent of the data were reported for a given year.

TABLE A-6. REPORTED ANNUAL HIGHWAY EXPENDITURES BY ARIZONA JURISDICTION (THOUSANDS OF DOLLARS)

JURISDICTION NAME	TOTAL ANNUAL EXPENDITURE(KNOWN DATA) 1981	1982	1983	1984	1985	1986	NUMBER
APACHE JCT	708.8	591.1	597.8			1601	4
AVONDALE		321.3					1
BENSON	325.6	332.1		352.6	416.2	659.3	5
BISBEE	65.1	118.6				13.3	3
BUCKEYE	187.3	261.2	207.1	383.4	557.6	450	6
BULLHEAD CITY							0
CAREFREE						35.1	1
CASA GRANDE		889.5	1533.6		7173.2		3
CHANDLER	22909.1	13053.8	6553.7	7974.7	9442.3		5
CHINO VALLEY	293.6	202.8	276.3	614.2	567.1	1049.9	6
CLARKDALE	49.8	75.8	39.6	2732.1	201.2	402.9	6
CLIFTON	258.8	330.2		852.6			3
COLORADO CITY							0
COOLIDGE	387	831.8	508.6			1294.2	4
COTTONWOOD	359.9	394.8	550.6	435.9	577.9	1123.2	6
DOUGLAS	1621.7	1500.2	945.9	1120.8	1254.8	2073.6	6
DUNCAN	35.1	52.7				133.8	3
EAGAR	439.6	456	598.4			1452.7	4
EL MIRAGE		80.3					1
ELOY	198	851.8	427.6	1071	33.6		5
FLAGSTAFF	3972.5	1572.9	3851.4	2620.4	4770.8	4553.5	6
FLORENCE	94		61.5		560	184.1	4
FREDONIA	60.1	57	93.5			104.1	4
GILA BEND		183.3	261.1	224.4	240.1	317.8	5
GILBERT		36.5	115.8				2
GLENDALE		8617.6	8128.6	13935.3	26751.3		4
GLOBE	336.1	948.8	710.8	961.9		1813.2	5
GOODYEAR	215.3	92.1	144.4	194.3	480.7	475.9	6
GUADALUPE	35.6	214	431.9				3
HAYDEN	125.2	136.9	147.2		61.7	96.5	5
HOLBROOK	604.7	375.8	1299.2	1902.5	1253	1355	6
HUACHUCA CITY	79	50.2	45.7	51	250.8	85.6	6
JEROME	33.1	33.9					2
KEARNY	160.9	210.6		131.8	278.5	713.4	5
KINGMAN	380.4	1675.3	1332.4			3982.6	4
LAKE HAVASU CITY	1961.2	2659.4	2282.1		1652.2	2213.3	5
MAMMOTH	63.6	80.1	192.6			901.2	4
MARANA		102.4	369.1	375.4			3
MESA	22533.1	22718.3	34519.5	52176.3	76266.3		5
MIAMI	198.6	375.5	243				3
NOGALES	259.7			2338.4		1892.9	3
ORO VALLEY	43.9	42.6	129.9	201.1		66.2	5
PAGE	374.5	134.7	696.7	875.7		697	5
PARADISE VALLEY	1075	964.4	74.9				3
PARKER	292.5	208.5	661.8	273.6	1239.8		5
PATAGONIA	25.1	49.1	51.7	102.5	15.2	62.7	6
PAYSON	880.4	802.4	1252.1	959			4
PEORIA	215.8	205	778.9	1186	2074	7818.8	6
PHOENIX	98281.6	125196.	160614.	184970.8	219026.3	212491.8	6
PIMA	64.7	51.8		229.3	290.8	265.1	5
PINETOP-LAKESIDE						1241.2	1
PRESCOTT	1152.9	2193.3	2221.2	2430.2	3694.8		5
PRESCOTT VALLEY	74.4	916.4	308.3	223.8	558.8		5

JURISDICTION NAME	TOTAL ANNUAL EXPENDITURE(KNOWN DATA) 1981	1982	1983	1984	1985	1986	NUMBER
SAFFORD	302.6	389.7		85	437	934.4	5
ST JOHNS	2272.5	566.8	982.8	1338.6	872.1	1173.7	6
SAN LUIS	100.8	94.1			402.2		3
SCOTTSDALE	41044.8	70203.2	20921.2	38929.2			4
SHOW LOW					821.3		1
SIERRA VISTA	2713.8	3713.4	3086.2	1679.8		6243.7	5
SNOWFLAKE		278.1		1088	668	1277.1	4
SOMERTON	183.2	0.2	246.9	491.3	594.7		5
SOUTH TUCSON			196.5	118.6			2
SPRINGERVILLE			371.5	442.7		292.6	3
SUPERIOR		177.5	197.4				2
SURPRISE	111.8	98.5	281.2	300.9	220.6		5
TAYLOR	179.8	103.3	177.6	167.3		310.6	5
TEMPE						18810.1	1
THATCHER	444.1	626.2	560.3	584.5	568.4	1523.5	6
TOLLESON	144	158.6	361.3	286.7	655.1		5
TOMBSTONE	75.3						1
TUCSON	17537.7	37637.4	64927.8	43541.5	51651.2	77836.1	6
WELLTON	57.4					54.6	2
WICKENBURG	405.1	61.3	239.2			341.9	4
WILLCOX	148.3	1259.6	403	461.4	417.9	472.2	6
WILLIAMS			647.7		1175.7		2
WINKELMAN	41	96.7	116.9		330.8	434.2	5
WINSLOW	752	968.5	1376.3	839.3		1734.9	5
YOUNGTOWN	42.1	43	105.7				3
YUMA	2671.3	2602.9	3523.7	3914.2	6347.6		5
COUNT	61	66	58	46	41	47	79
SUBTOTAL	230560.	310319.	332382.	376170	424841.6	362860.5	319
APACHE	1475.5	2023.8		158.2	3830.9	4981.1	5
COCHISE	3787.6	2913	3766.7	4472	10549.7	13209.6	6
COCONINO	5596.4	6894.2	7557.2	8993.5	7273.4	10637.9	6
GILA	4381.7	5344.9	3748.4	4573.1			4
GRAHAM	891.6	1496	1197.3				3
GREENLEE	925.5		611.2			928.2	3
LA PAZ			47.2	338.3	2258.9		3
MARICOPA	78595.8	52710.1					2
MOJAVE	2901.3	3101.7	3581.8				3
NAVAJO	4518.8	1606.6	1544.5	3889.7	2196.6	3177.8	6
PIMA		35631.3	35311.3	54504.5			3
PINAL		6408.8	4438.2			5841	3
SANTA CRUZ	1070.9	610.1	953.6			906.5	4
YAVAPAI							0
YUMA						859.2	1
COUNT	10	11	11	7	5	8	15
SUBTOTAL	104145.	118730.	62557.4	76929.3	26107.5	40541.3	52
TOTAL COUNT	71	77	69	53	46	55	94
GRAND TOTAL	334705	429049.	395339.	453099.3	450951.1	403401.8	371

TABLE A-7. NUMBER OF YEARS OF DATA REPORTED FOR ARIZONA LOCAL JURISDICTIONS

Years of Data Reported	Number of Jurisdictions Reporting	Percent Reporting
0	3	3
1	8	9
2	7	7
3	18	19
4	14	15
5	25	27
6	19	20

Total number of jurisdictions = 94

TABLE A-8. NUMBER OF ARIZONA LOCAL JURISDICTIONS REPORTING ANNUAL EXPENDITURES

Year	Number of Jurisdictions Reporting	Percent Reporting
1981	71	76
1982	77	82
1983	69	73
1984	53	56
1985	46	49
1986	55	59

Total Jurisdictions = 94
Cities/Towns = 79
Counties = 15

Thirty-four percent of the data required to establish a complete matrix of annual expenditures by local jurisdiction were estimated using the procedure outlined in Figure A-3. Initially the jurisdictions were separated into two groups based on whether or not at least three years of data were reported. A linear regression analysis was performed for each jurisdiction having three or more years of data. Annual expenditures were regressed against year, with 1981 representing year 1, 1982 representing year 2, etc. The slope (S_i) of the regression line for each jurisdiction (i) represented an estimate of the average annual change in highway expenditures. The change in expenditures from year 1 to any succeeding year was calculated as:

$$CE_{ij} = S_i \times (j-1) \qquad \text{(A-1)}$$

where:

CE_{ij} = the change in annual highway expenditures for jurisdiction i from year 1 to succeeding year j, and

S_i = the average annual change in expenditures for jurisdiction i based on a linear regression analysis.

An initial estimate of the statewide change (SC) in highway expenditures was determined for the cities/towns and counties separately based on the individual jurisdiction results from Equation A-1. That is:

$SC_{j,cities}$ = C_{ij} where i is the index of cities with known data. (A-2)

$SC_{j,counties}$ = C_{ij} where i is the index of counties with known data.

The initial estimate of the total annual change in expenditures required adjustment for the unaccounted for cities and counties reporting less than three years of data. Population based expansion factors were used to increase the initial estimate of the annual change in expenditures. The population of the incorporated and unincorporated areas is given in Table A-9. The expansion factors were calculated using Equation A-3.

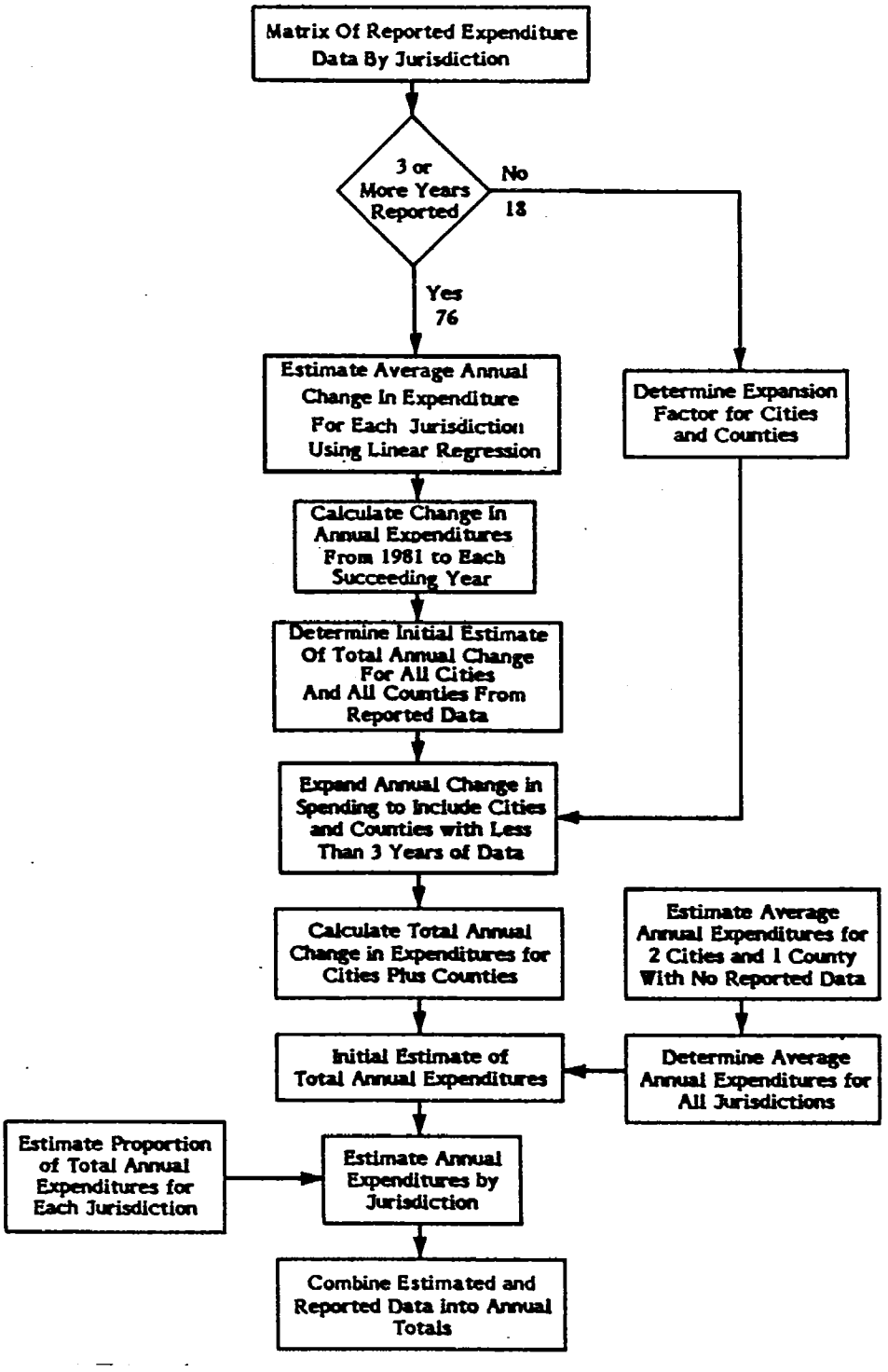

FIGURE A-3. PROCEDURE FOR ESTIMATING MISSING ARIZONA LOCAL JURISDICTION HIGHWAY EXPENDITURE DATA

TABLE A-9. POPULATION OF JURISDICTIONS WITH LESS THAN THREE-YEARS OF REPORTED EXPENDITURE DATA

Jurisdiction	1985 Total[a,b] Population
Cities/Towns	
Avondale	9,525
Bullhead City	17,290
Carefree	1,500
Colorado City	2,110
El Mirage	3,915
Gilbert	11,320
Jerome	470
Pinetop-Lakeside	2,390
Show Low	5,030
South Tucson	6,040
Superior	4,190
Tempe	129,595
Tombstone	1,790
Wellton	940
Williams	2,375
Total Cities/Towns	**198,480**

Jurisdiction	1985 Total Population	1985 Population of Cities/Towns	County Rural[c] Population
Counties			
Maricopa	1,814,200	1,622,900	191,800
Yavapai	86,400	34,250	52,150
Yuma	84,800	50,800	34,000
Total Counties			**277,950**

(a) Arizona Population = 3,160,000
Arizona Cities/Town Population = 2,378,040
Arizona Population Outside Cities/Towns = 782,560

(b) Source: "A Demographic Guide to Arizona - 1985," Arizona Department of Economic Security, Population Statistics Unit, Report #14

(c) Obtained as the difference between total jurisdiction population and the jurisdiction population within Cities/Town.

$$EF_{cities} = 1/(1 - (P_{cities}/AP_{cities}))$$

$$EF_{counties} = 1/(1 - (P_{counties}/AP_{counties})) \quad \text{(A-3)}$$

where:

EF = the expansion factor for city or county expenditures,

P = the population within incorporated city boundaries or within unincorporated county areas for cities or counties with less than three years of reported data, and

AP = the state total population within incorporated city boundaries or within unincorporated county areas.

The initial estimate of the city and county total expenditures were expanded as the product of the expansion factor as shown in Equation A-4.

$$ESC_{j,cities} = SC_{j,cities} \times EF_{j,cities}$$

$$ESC_{j,counties} = SC_{j,counties} \times EF_{j,counties} \quad \text{(A-4)}$$

where:

ESC_j = the expanded annual change in expenditures for cities or counties in year j.

The 15 cities and towns with less than three years of data had a 1985 population of 198,480 (see Table A-9). The total population of the 79 cities and towns was 2,378,040. Therefore the expansion factor for the cities and towns was 1.091.

The population in unincorporated areas of the three counties with less than three years of data was 277,950, and the total unincorporated area population of the 15 counties was 782,560. This resulted in a county expansion factor of 1.551.

The total statewide change (TSC) in expenditures from year 1 to any succeeding year j was calculated as:

$$TSC_j = ESC_{j,cities} + ESC_{j,counties} \quad \text{(A-5)}$$

It remained to determined an estimate of the total annual expenses for local jurisdictions for each year. The next step in the determination of the total annual expenditures was the determination of the average annual expenditures for all jurisdictions from the known data. This was calculated as:

$$X_i = \sum_j x_{ij}/N_i \qquad \text{(A-6)}$$

$$TX = \sum_i X_i \qquad \text{(A-7)}$$

where:

X_i = the total average annual expenditure for each jurisdiction i,

x_{ij} = the known annual expenditure for jurisdiction i in year j,

N_i = the number of years of reported data for jurisdiction i, and

TX = total of the average annual expenditures for all jurisdictions

Bullhead City, Colorado City and Yavapai County did not report data for any of the years from 1981 through 1986. An estimate of the annual average expenditures for this time period was made based on a comparison to other jurisdictions of similar population and geographic location. Although these estimates are somewhat arbitrary, they did not significantly effect the results of this analysis, and the order of magnitude estimates appeared reasonable. The jurisdictions used in the comparative analysis are shown in Table A-10 along with the estimates of average expenditures for these jurisdictions failing to report any data.

TABLE A-10. ESTIMATES OF AVERAGE ANNUAL EXPENDITURES FOR LOCAL JURISDICTION WITH NO REPORTED EXPENSE DATA

Jurisdiction with No Reported Data	1985 Population[a]	Estimated Average Expenditure
Bullhead City	17,290	$1,500,000
Colorado City	2,110	80,000
Yavapai	86,400	5,000,000

TABLE A-10 (CONTINUED)

Jurisdictions with Similar Population and Geographic Characteristics	1985 Population	Average Annual Expenditures (1981-1986)
Lake Havasu City	18,310	$2,153,000
Huachuca City	2,010	93,700
Cochise County	94,600	6,483,000

(a) Source: "A Demographic Guide to Arizona - 1985," Arizona Department of Economic Security, Population Statistics Unit, Report #14

The initial estimate of the total annual expenditures (TAE) for 1981 was generated from Equation A-8:

$$TAE_{1981} = TX - (2.5 \times TSC_{1981}) \qquad \text{(A-8)}$$

Equation A-8 assumes that the total of the average annual expenditures (TX) represents the midpoint of the time period from 1981 through 1986. Thus, subtracting 2.5 times the annual change in total expenditures results in an initial estimate of the total expenditures for 1981.

The initial estimate for the total annual expenditures for the succeeding years was calculated using Equation A-9:

$$TAE_j = TAE_{1981} + TSC_j \qquad \text{(A-9)}$$

The initial estimate of the total annual expenditures was proportioned using Equation A-10 to generate the individual jurisdiction estimates of the missing data for each year.

$$EAE_{ij} = P_i \times TAE_j \qquad \text{(A-10)}$$

where:

EAE_{ij} = the estimated annual expenditures for jurisdiction i in year j, and

P_i = estimated proportion of the total annual expenses for each jurisdiction i.

$$P_i = X_i/TX \qquad \text{(A-11)}$$

The EAE for jurisdictions with missing data were combined with the known data to generate the final matrix of expenditures for Arizona local jurisdictions (see Table A-11). The final estimates of the total annual expenditures were based on the combination of the estimated and known data as shown in Equation A-12.

$$AE_j = \sum_i (EAE_{ij} + x_{ij}) \qquad \text{(A-12)}$$

The final estimates of the total annual expenses for the local jurisdictions are given in Table A-12. In general, as the percent of reporting jurisdictions declined so did the percent of the estimated total annual expenditures that were reported. The exception is 1985 where 49 percent of the jurisdictions reported data which accounted for 64 percent of the estimated total annual expenditures. This is a smaller percent of reporting jurisdictions than in 1986 and accounts for a larger percent of the estimated expenditures. However, a review of the reported data in Table A-11 indicated that several jurisdictions, with a history of relatively large expenditures, reported data in 1985, but not in 1986 (Casa Grande, Chandler, Glendale, and Mesa). This does not appear offset by jurisdictions reporting in 1986 and not in 1985. Therefore, the estimates of the annual total expenditures appear consistent with the trends in the reported data, and also appear to represent reasonable values within the context of this study.

The estimated annual expenditures for each jurisdiction were proportioned among the roadway functional classes based on the historical trends from the reported data. Although this may be somewhat arbitrary it was deemed sufficiently accurate within the context of the use of these data for this study. The percent of the total local jurisdiction expenditures attributable to each functional class of

TABLE A-11. REPORTED PLUS ESTIMATED HIGHWAY EXPENDITURES BY ARIZONA JURISDICTION (THOUSANDS OF DOLLARS)

JURISDICTION NAME	ACTUAL EXPENDITURE DATA COMBINED WITH ESTIMATED EXPENDITURES					
	1981	1982	1983	1984	1985	1986
APACHE JCT	708.8	591.1	997.8	1048.2	1195.3	1601.0
AVONDALE	200.1	321.3	297.1	345.5	394.0	442.5
BENSON	325.6	332.1	385.7	352.6	416.2	659.3
BISBEE	65.1	118.6	60.7	70.6	80.5	13.3
BUCKEYE	187.3	261.2	207.1	383.4	557.6	450.0
BULLHEAD CITY	934.1	1160.4	1386.8	1613.2	1839.6	2065.9
CAREFREE	21.9	27.2	32.5	37.7	43.0	35.1
CASA GRANDE	1990.0	880.5	1533.6	3436.9	7173.2	4401.5
CHANDLER	22909.1	13053.8	6553.7	7974.7	9442.3	16509.2
CHINO VALLEY	293.6	202.8	276.3	614.2	567.1	1049.9
CLARKDALE	49.8	75.8	39.6	2732.1	201.2	402.9
CLIFTON	258.8	330.2	444.3	852.6	589.3	661.8
COLORADO CITY	49.8	61.9	74.0	86.0	98.1	110.2
COOLIDGE	387.0	831.8	508.6	812.4	926.4	1294.2
COTTONWOOD	359.9	394.8	550.6	435.9	577.9	1123.2
DOUGLAS	1621.7	1500.2	945.9	1120.8	1254.8	2073.6
DUNCAN	35.1	52.7	69.3	79.4	90.6	133.8
EAGAR	439.6	456.0	598.4	792.3	903.4	1452.7
EL MIRAGE	50.0	80.3	74.2	86.4	98.5	110.6
ELOY	198.0	851.8	427.6	1071.0	33.6	711.2
FLAGSTAFF	3872.5	1572.9	3851.4	2620.4	4770.8	4553.5
FLORENCE	94.0	174.0	61.5	241.9	560.0	184.1
FREDONIA	60.1	57.0	93.5	84.6	96.5	104.1
GILA BEND	152.8	183.3	261.1	224.4	240.1	317.8
GILBERT	47.4	36.5	115.8	81.9	93.4	104.9
GLENDALE	8941.0	8617.6	8128.6	13935.3	26751.3	19775.4
GLOBE	336.1	948.8	710.8	961.9	1170.2	1813.2
GOODYEAR	215.3	92.1	144.4	194.3	480.7	475.9
GUADALUPE	35.6	214.0	431.9	244.3	278.6	312.9
HAYDEN	125.2	136.9	147.2	122.1	61.7	96.5
HOLBROOK	604.7	375.8	1299.2	1902.5	1253.0	1355.0
HUACHUCA CITY	79.0	50.2	45.7	51.0	250.8	85.6
JEROME	33.1	33.9	31.0	36.0	41.1	46.1
KEARNY	160.9	210.6	276.5	131.8	278.5	713.4
KINGMAN	380.4	1675.3	1332.4	1981.7	2259.8	3982.6
LAKE HAVASU CITY	1961.2	2659.4	2282.1	2316.1	1652.2	2213.3
MAMMOTH	63.6	80.1	192.6	332.7	379.4	901.2
MARANA	175.8	102.4	369.1	375.4	346.2	388.8
MESA	22533.1	22718.3	34519.5	52176.3	76266.3	57354.0
MIAMI	198.6	375.5	243.0	292.9	334.0	375.1
NOGALES	259.7	1106.5	1322.4	2338.4	1754.1	1692.9
ORO VALLEY	43.9	42.6	127.9	201.1	118.6	66.2
PAGE	374.5	134.7	696.7	875.7	681.5	697.0
PARADISE VALLEY	1075.0	964.4	74.9	757.9	864.3	970.7
PARKER	292.5	208.5	661.8	273.6	1239.8	737.2
PATAGONIA	25.1	49.1	51.7	102.5	15.2	62.7
PAYSON	880.4	802.4	1252.1	959.0	1193.8	1340.8
PEORIA	215.8	205.0	778.9	1186.0	2074.0	7818.8
PHOENIX	98281.6	125196.3	160614.4	184970.8	219026.3	212491.8
PIMA	64.7	51.8	166.7	229.3	290.8	265.1
PINETOP-LAKESIDE	772.9	960.2	1147.5	1334.9	1522.2	1241.2
PRESCOTT	1152.9	2193.3	2221.2	2430.2	3684.8	3218.0
PRESCOTT VALLEY	74.4	916.4	308.3	223.8	558.8	573.4
SAFFORD	302.6	389.7	397.3	85.0	437.0	934.4
ST JOHNS	2272.5	586.8	982.8	1338.6	872.1	1173.7
SAN LUIS	100.8	94.1	184.0	214.1	402.2	274.1
SCOTTSDALE	41044.8	70203.2	20921.2	38729.2	52457.6	58913.0
SHOW LOW	511.4	635.4	759.3	883.3	821.3	1131.2
SIERRA VISTA	2713.8	3713.4	3086.2	1679.8	4276.8	6243.7
SNOWFLAKE	515.5	278.1	765.3	1088.0	668.0	1277.1
SOMERTON	183.2	0.2	246.9	491.3	594.7	417.7
SOUTH TUCSON	98.1	121.9	196.5	118.6	193.2	217.0
SPRINGERVILLE	229.7	285.4	371.5	442.7	452.4	292.6
SUPERIOR	116.7	177.5	197.4	201.6	229.9	259.2
SURPRISE	111.8	98.5	281.2	300.9	220.6	279.0
TAYLOR	179.8	103.3	177.6	167.3	230.2	310.6
TEMPE	11713.3	14552.0	17390.7	20229.5	23068.2	18810.1
THATCHER	444.1	626.2	560.3	584.5	568.4	1523.5
TOLLESON	144.0	158.6	361.3	286.7	655.1	442.3
TOMBSTONE	75.3	58.3	69.6	81.0	92.3	103.7
TUCSON	17537.7	37637.4	64927.8	43541.5	51651.2	77836.1
WELLTON	57.4	43.3	51.8	60.2	68.7	54.6
WICKENBURG	405.1	61.3	239.2	281.6	321.2	341.9
WILLCOX	148.3	1259.6	403.0	461.4	417.9	472.2
WILLIAMS	567.7	705.3	847.7	980.5	1175.7	1255.7
WINKELMAN	41.0	96.7	116.9	219.3	330.8	434.2
WINSLOW	752.0	968.5	1376.3	839.3	1391.0	1734.9
YOUNGTOWN	42.1	43.0	105.7	68.4	78.0	87.6
YUMA	2671.3	2602.9	3523.7	3914.2	6347.6	5250.1
SUBTOTAL	257649.2	330210.9	357767.8	415625.3	525093.7	541700.3
APACHE	1475.5	2023.8	2305.7	158.2	3830.9	4981.1
COCHISE	3787.6	2913.0	3966.7	4472.0	10549.7	13209.6
COCONINO	5596.4	6984.2	7557.2	8393.5	7273.4	10637.9
GILA	4381.7	5344.9	3748.4	4573.1	5533.4	6214.4
GRAHAM	891.6	1496.0	1197.3	1285.1	1465.5	1645.8
GREENLEE	925.5	635.6	611.2	883.6	1007.6	928.2
LA PAZ	548.9	681.9	47.2	338.3	2258.9	1214.0
MARICOPA	78595.8	52710.1	60698.9	70607.0	80515.0	90423.1
MOJAVE	2901.3	3101.7	3581.8	3436.0	3918.2	-4400.3
NAVAJO	4518.8	1606.6	1544.5	3889.7	2196.6	3177.8
PIMA	26039.1	35631.3	35311.3	54504.5	51281.6	57592.3
PINAL	3463.9	6408.8	4438.2	5982.4	6821.9	5841.0
SANTA CRUZ	1070.9	610.1	953.6	952.1	1085.7	906.5
YAVAPAI	3113.6	3868.1	4622.7	5377.3	6131.9	6885.4
YUMA	535.0	664.7	794.4	924.0	1053.7	859.2
SUBTOTAL	137845.6	124580.9	131379.1	166376.9	184924.0	209917.6
GRAND TOTAL	395494.8	454791.8	489146.9	582002.1	710017.7	750617.9

roadway was developed from the reported data. An aggregate summary of these data are shown in Table A-13.

TABLE A-12. REPORTED AND ESTIMATED TOTAL ANNUAL EXPENDITURES FOR ARIZONA LOCAL JURISDICTION (THOUSANDS OF DOLLARS)

Year	Annual Expenditures From Known Data	Total Estimated Annual Expenditures	Percent Reported
1981	$334,706	$395,495	85
1982	429,049	454,792	94
1983	395,339	489,147	81
1984	453,099	582,002	78
1985	450,951	710,018	64
1986	403,402	750,618	54

TABLE A-13. PERCENT OF ARIZONA LOCAL JURISDICTION EXPENDITURES BY ROADWAY FUNCTIONAL CLASS

Jurisdiction	Functional Class	Year 1981	1982	1983	1984	1985	Weighted Average
County (Rural)							
	Principal Arterial	8.6	5.4	7.7	18.1	12.1	11.1
	Minor Arterial	2.1	1.9	6.4	4.8	4.2	4.1
	Major Collector	15.7	25.5	23.2	19.4	21.8	21.5
	Minor Collector	22.6	6.6	11.0	9.6	17.0	13.9
	Local	51.0	60.6	51.7	48.1	44.9	49.4
	Rural Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
City (Urban)							
	Principal Arterial	20.3	44.0	50.2	50.2	52.9	45.6
	Minor Arterial	21.9	16.5	6.5	10.0	8.2	11.7
	Collector	22.0	8.0	10.4	11.0	10.6	11.8
	Local	35.8	31.4	32.9	28.8	28.3	30.9
	Urban Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Generated from ADOT data

Within each functional class of roadway, it was necessary to estimate the percent of expenditures for each of the spending categories. This was accomplished using the averages from the reported data that are shown in Table A-14.

TABLE A-14. ARIZONA LOCAL JURISIDICTION AVERAGE ANNUAL PERCENT OF EXPENDITURES BY SPENDING CATEGORY AND ROADWAY FUNCTIONAL CLASS (1981-1985)

Spending Category	Functional Class								
	Rural					Urban			
	PA	MiA	MC	MiC	Lo	PA	MiA	NC	Lo
Right-of-Way	0.2	0.2	15.9	1.3	0.4	24.5	7.7	6.1	1.3
Preliminary Engineering	2.1	1.4	17.4	1.7	4.3	9.6	6.3	5.9	2.9
New Construction	0.0	0.0	0.0	0.8	32.4	6.1	9.9	23.6	44.9
Total Reconstruction	12.0	27.3	41.6	18.9	14.3	35.8	52.1	28.5	20.9
Total Bridge	0.9	1.2	0.7	39.8	0.4	10.1	15.9	15.5	0.1
Safety/Traffic Ops/ TSM	3.2	1.0	9.8	3.5	1.6	2.3	2.0	3.6	2.5
Environmental	0.0	0.0	0.1	0.0	0.3	0.4	1.1	0.6	1.4
Total Maintenance	81.6	68.9	14.5	34.0	46.3	11.2	5.1	17.0	26.0
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
UC = Urban Collector
Lo = Local
Source: Generated from ADOT data

It was also necessary to estimate the percent of each spending category for a functional class that was associated with a federal-aid project. In this way, the amount of federal dollars spent at the local level could be estimated.

The reporting of federal-aid, illustrated in Figure A-2 for the City of Phoenix, was determined to be inconsistent and sporadic for the majority of jurisdictions. A simplified procedure for estimating the percent of funds for each spending category and functional class was used based on a summary of two years of local data supplied by ADOT on the FHWA Form 534. The data represented local expenditures for 1981 and 1982. The percent of each spending category attributed to federal-aid projects is shown in Tables A-15 and A-16 by roadway functional class. These percents were applied to the local jurisdiction data to estimate expenditures on federal-aid projects at the local level. These expenditures were then factored by the federal matching ratios to generate an estimate of federal spending at the local level.

TABLE A-15. AVERAGE PERCENT OF ARIZONA RURAL LOCAL JURISDICTION FEDERAL-AID (FAP) AND NON-FEDERAL-AID PROJECT (NFAP) (1981-1982)

Spending Category	Functional Class							
	PA(a)		MiA		MC		MiC	
	FAP	NFAP	FAP	NFAP	FAP	NFAP	FAP	NFAP
Right-of-Way	---	---	100.0	0.0	88.0	12.0	0.0	100.0
Engineering	---	---	26.9	73.1	99.2	0.8	0.0	100.0
New Construction	---	---	0.0	0.0	0.0	0.0	0.0	100.0
Total Reconstruction	---	---	24.6	75.4	94.6	5.4	0.0	100.0
Total Bridge	---	---	100.0	0.0	100.0	0.0	0.0	100.0
Safety/Traffic Ops/ TSM	---	---	0.8	99.2	88.0	12.0	0.0	100.0
Environmental	---	---	0.0	0.0	0.0	0.0	0.0	100.0
Total Maintenance	---	---	0.0	100.0	0.0	100.0	0.0	100.0
TOTAL	---	---	**8.4**	**91.6**	**50.6**	**49.5**	**0.0**	**100.0**

(a) Data not available
PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
Lo = Local

TABLE A-16. AVERAGE PERCENT OF ARIZONA URBAN LOCAL JURISDICTION EXPENDITURES BY FEDERAL-AID (FAP) AND NONFEDERAL-AID (NFAP) PROJECT (1981-1982)

Spending Category	Functional Class							
	PA		MiA		UC		Lo	
	FAP	NFAP	FAP	NFAP	FAP	NFAP	FAP	NFAP
Right-of-Way	82.7	17.3	82.1	17.9	33.1	66.9	0.0	100.0
Engineering	76.2	24.0	52.7	47.3	16.6	83.4	0.0	100.0
New Construction	34.8	65.2	25.9	74.1	29.1	70.9	0.0	100.0
Total Reconstruction	40.5	59.5	42.1	57.9	9.3	90.7	0.0	100.0
Total Bridge	76.4	23.6	29.6	70.4	49.5	50.5	0.0	100.0
Safety/Traffic Ops/ TSM	71.5	28.5	54.9	45.1	21.6	78.4	0.0	100.0
Environmental	100.0	0.0	97.6	2.4	0.0	100.0	0.0	100.0
Total Maintenance	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
TOTAL	**42.8**	**57.2**	**38.2**	**61.8**	**18.7**	**81.3**	**0.0**	**100.0**

PA = Principal Arterial
MiA = Minor Arterial
UC = Urban Collector
Lo = Local
Source: Generated from ADOT data

STATE AND LOCAL EXPENDITURES FOR OTHER STATES

Missing state level data and local expenditures for other states were estimated in two steps. First, the missing total state and local expenditures, equivalent to the data reported on FHWA Form 534, were estimated based on the trends in the reported data. These estimates represented expenditures on roadways with a functional class of collector and above.

The second step was to estimate local expenditures for local roadways. This was based on data reported in Highway Statistics and the data for local government expenditures for roadways with a functional class of collector and above.

State and Local Expenditures (FHWA Form 534 Data)

The basis for the estimates of state and local expenditures, equivalent to those reported on FHWA Form 534, was the estimate of the annual total expenditure for those years when no data were reported. The estimated annual total expenditures were proportioned to derive the estimates of expenditures by roadway functional class, expenditure category, and project funding source designation. These proportions were based on those exhibited in the reported data.

Table A-17 is a matrix with the known and estimated annual expenditures for state and local jurisdictions stratified by federal-aid project (FAP), non-federal-aid project (NFAP), and non-federal-aid system projects (NFASP). The 1981 estimates for Arizona were generated by linearly regressing annual expenditures against year for each of the funding categories, and extrapolating the resulting equation.

TABLE A-17. MATRIX OF KNOWN AND ESTIMATED ANNUAL EXPENDITURE DATA (THOUSANDS OF DOLLARS)

			Year(a)				
State	Level	Category	1981	1982	1983	1984	1985
Arizona	State	FAS-FAP(b)	**83,343**	114,980	146,978	210,724	265,656
		FAS-Non FAP	**11,682**	16,190	20,694	29,867	72,248
		Non FAS	**37,304**	38,250	43,462	42,275	0
North Carolina	State	FAS-FAP	212,709	177,722	192,085	241,417	320,325
		FAS-Non FAP	172,552	141,331	172,695	145,373	124,882
		Non FAS	12,806	31,272	18,825	40,445	35,708
	Local	FAS-FAP	0	0	0	**0**	**0**
		FAS-Non FAP	6,428	7,875	7,875	**7,393**	**7,393**
		Non FAS	3,896	2,432	2,432	**2,920**	**2,920**
Pennsylvania	State	FAS-FAP	438,614	**633,956**	519,896	626,426	950,887
		FAS-Non FAP	549,596	**534,206**	462,464	554,854	569,909
		Non FAS	0	**10,245**	1	17,301	23,677
	Local	FAS-FAP	**19,270**	22,481	21,141	16,525	16,931
		FAS-Non FAP	**254,337**	110,775	293,686	275,898	336,990
		Non FAS	**30,400**	14,806	34,980	32,491	39,324
Washington	State	FAS-FAP	204,785	278,105	308,673	338,864	385,302
		FAS-Non FAP	72,784	104,650	105,752	120,474	141,063
		Non FAS	53	294	396	25	516
	Local	FAS-FAP	71,123	78,004	68,581	51,562	**66,318**
		FAS-Non FAP	53,292	160,946	156,391	216,236	**146,716**
		Non FAS	41,419	28,994	32,389	38,350	**35,288**

(a) Bold numbers are estimated quantities.
(b) FAS = Federal-Aid System, FAP = Federal-Aid Project

The estimates of the annual totals for the other states and the local jurisdictions in other states were generated using averages of the reported data. This was done because the reported data did not show trends conducive to utilizing linear regression techniques. Overall, 18 out of 105 (17 percent) of the annual totals reported in Table A-17 required estimation.

The estimated annual total expenditures by funding category were proportioned based on the historical data to represent expenditures by functional class and spending category within functional class. The percentages applied to the estimated state and local totals are given in Tables A-18 through A-25. These percentages represent averages over all years of reported data.

TABLE A-18. AVERAGE PERCENT OF STATE LEVEL EXPENDITURES BY ROADWAY FUNCTIONAL CLASS (1981-1985)

Functional Class	State			
	Arizona	North Carolina	Pennsylvania	Washington
Rural:				
Interstate	32.1	17.1	5.6	14.6
Principal Arterial	10.7	22.4	6.1	17.5
Minor Arterial	9.5	6.4	6.5	12.0
Major Collector	4.4	22.6	6.4	4.6
Minor Collector	1.2	7.0	1.2	0.1
Local	0.0	0.0	0.0	0.0
Urban:				
Interstate	20.4	6.1	21.3	35.6
Freeway/Expressway	15.4	2.8	14.0	3.5
Principal Arterial	5.2	8.9	10.7	8.2
Minor Arterial	0.6	5.7	25.2	2.8
Collector	0.5	1.0	3.0	1.1
Local	0.0	0.0	0.0	0.0
TOTAL	100.00	100.00	100.00	100.00

TABLE A-19. ARIZONA STATE AVERAGE ANNUAL PERCENT OF EXPENDITURES BY SPENDING CATEGORY AND ROADWAY FUNCTIONAL CLASS (1981-1985)

Spending Category	Functional Class									
	Rural					Urban				
	I	PA	MiA	MC	MiC	I	OF	PA	MiA	UC
Right-of-Way	4.0	6.3	2.5	3.1	9.1	13.5	33.1	1.8	9.4	53.5
Preliminary Engineering	8.4	4.8	6.8	7.3	4.7	12.8	12.5	4.4	6.3	0.8
New Construction	25.4	0.0	0.0	0.0	0.0	35.3	42.8	0.0	1.2	36.1
Total Reconstruction	36.5	59.1	40.2	37.4	37.5	27.6	8.2	84.4	71.7	9.6
Total Bridge	2.1	0.1	6.0	15.6	19.6	0.0	0.0	7.6	9.3	0.0
Safety/Traffic Ops/TSM	10.3	2.4	2.6	5.4	7.0	5.3	1.4	0.4	0.3	0.0
Environmental	0.6	0.0	0.0	0.0	0.0	4.4	0.5	0.0	1.8	0.0
Total Maintenance	12.7	27.3	41.9	31.2	22.1	1.1	1.5	1.4	0.0	0.0
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

I = Interstate
PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
UC = Urban Collector
OF = Other Freeway

TABLE A-20. NORTH CAROLINA STATE AVERAGE ANNUAL PERCENT OF EXPENDITURES BY SPENDING CATEGORY AND ROADWAY FUNCTIONAL CLASS (1981-1985)

Spending Category	Functional Class									
	Rural					Urban				
	I	PA	MiA	MC	MiC	I	OF	PA	MiA	UC
Right-of-Way	10.5	12.1	4.1	5.3	2.7	22.1	26.2	16.4	8.4	1.7
Preliminary Engineering	7.5	5.5	9.5	6.0	2.6	4.9	15.2	4.5	3.0	3.0
New Construction	42.4	36.2	11.9	6.3	0.2	30.3	21.8	18.3	7.2	4.3
Total Reconstruction	15.5	30.0	32.0	31.1	28.4	27.8	12.8	31.1	28.6	23.7
Total Bridge	0.2	2.3	12.2	10.9	12.2	1.6	0.0	1.8	8.6	13.1
Safety/Traffic Ops/TSM	7.5	1.9	0.9	2.0	1.4	4.2	14.0	5.5	8.0	5.1
Environmental	6.4	0.2	0.0	0.1	0.0	0.0	0.1	0.7	0.1	0.6
Total Maintenance	10.0	11.8	29.4	38.3	52.5	9.1	9.9	21.7	36.3	48.5
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

I = Interstate
PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
UC = Urban Collector
OF = Other Freeway

TABLE A-21. PENNSYLVANIA STATE AVERAGE ANNUAL PERCENT OF EXPENDITURES BY SPENDING CATEGORY AND ROADWAY FUNCTIONAL CLASS (1981-1985)

Spending Category	Functional Class									
	Rural					Urban				
	I	PA	MiA	MC	MiC	I	OF	PA	MiA	UC
Right-of-Way	0.1	4.1	5.8	0.6	15.7	3.0	2.6	1.2	5.7	5.7
Preliminary Engineering	0.2	1.5	9.0	3.2	19.4	3.0	5.2	3.7	5.3	13.4
New Construction	38.6	25.2	22.9	1.4	25.1	34.5	17.5	5.6	15.0	21.8
Total Reconstruction	35.8	23.4	21.2	1.3	23.4	33.1	16.8	5.4	14.4	20.9
Total Bridge	20.7	13.5	12.3	0.7	13.6	20.8	10.6	3.4	9.0	13.1
Safety/Traffic Ops/TSM	1.3	0.8	0.8	0.1	0.9	1.4	0.7	0.2	0.6	0.9
Environmental	0.6	0.4	0.3	0.0	0.4	0.4	0.2	0.1	0.2	0.3
Total Maintenance	2.7	31.1	27.7	92.7	1.5	3.8	46.4	80.4	49.8	23.9
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

I = Interstate
PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
UC = Urban Collector
OF = Other Freeway

TABLE A-22. WASHINGTON STATE AVERAGE ANNUAL PERCENT OF EXPENDITURES BY SPENDING CATEGORY AND ROADWAY FUNCTIONAL CLASS (1981-1985)

Spending Category	Functional Class									
	Rural					Urban				
	I	PA	MiA	MC	MiC	I	OF	PA	MiA	UC
Right-of-Way	3.8	2.2	2.8	2.2	3.2	11.2	3.1	8.0	4.0	13.5
Preliminary Engineering	11.0	14.0	17.7	14.1	58.6	18.4	22.3	17.4	24.0	20.2
New Construction	35.7	4.9	1.1	6.8	0.0	16.2	23.4	22.7	13.1	0.4
Total Reconstruction	18.6	30.0	37.7	35.3	25.7	36.5	25.8	30.1	29.9	43.0
Total Bridge	1.1	26.7	8.7	11.0	4.4	2.1	0.8	1.6	8.3	12.3
Safety/Traffic Ops/TSM	6.1	5.3	6.9	5.1	4.9	8.1	12.1	7.3	12.8	6.5
Environmental	0.8	2.4	1.2	0.5	0.0	0.8	1.3	1.7	0.6	0.4
Total Maintenance	23.1	14.5	23.9	25.0	3.2	6.7	11.2	11.2	7.3	3.7
TOTAL	**100.2**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

I = Interstate
PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
UC = Urban Collector
OF = Other Freeway

TABLE A-23. NORTH CAROLINA LOCAL JURISDICTION AVERAGE ANNUAL PERCENT OF EXPENDITURES BY SPENDING CATEGORY AND ROADWAY FUNCTIONAL CLASS (1981-1985)

Spending Category	Functional Class							
	Rural (County)				Urban (City/Town)			
	PA	MiA	MC	MiC	OF	PA	MiA	UC
Right-of-Way	1.0	1.0	1.0	0.9	5.4	5.1	3.3	2.7
Preliminary Engineering	1.1	1.1	1.1	1.1	6.1	6.0	5.5	5.3
New Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Reconstruction	37.0	37.0	37.0	35.9	34.9	34.3	33.3	33.2
Total Bridge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Safety/Traffic Ops/ TSM	0.5	0.5	0.5	0.4	2.2	2.0	0.9	0.5
Environmental	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Maintenance	60.4	60.4	60.4	61.7	51.4	52.6	57.0	60.2
TOTAL	**100.1**	**100.1**	**100.1**	**100.0**	**100.0**	**100.1**	**100.0**	**100.0**

PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
OF = Other Freeway
UC = Urban Collector

TABLE A-24. PENNSYLVANIA LOCAL JURISDICTION AVERAGE ANNUAL PERCENT OF EXPENDITURES BY SPENDING CATEGORY AND ROADWAY FUNCTIONAL CLASS (1981-1985)

Spending Category	Functional Class							
	Rural (County				Urban (City/Town)			
	PA	MiA	MC	MiC	OF	PA	MiA	UC
Right-of-Way	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3
Preliminary Engineering	0.0	0.0	0.0	1.9	0.0	0.0	0.0	1.9
New Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Reconstruction	0.0	0.0	0.0	26.8	0.0	0.0	0.0	26.7
Total Bridge	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0
Safety/Traffic Ops/ TSM	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.8
Environmental	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4
Total Maintenance	0.0	0.0	0.0	67.9	0.0	0.0	0.0	67.9
TOTAL	**0.0**	**0.0**	**0.0**	**100.0**	**0.0**	**0.0**	**0.0**	**100.0**

PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
OF = Other Freeway
UC = Urban Collector

TABLE A-25. WASHINGTON LOCAL JURISDICTION AVERAGE ANNUAL PERCENT OF EXPENDITURES BY SPENDING CATEGORY AND ROADWAY FUNCTIONAL CLASS (1981-1985)

Spending Category	Functional Class							
	Rural (County)				Urban (City/Town)			
	PA	MiA	MC	MiC	OF	PA	MiA	UC
Right-of-Way	0.0	0.0	1.7	1.8	0.0	1.8	2.6	2.9
Preliminary Engineering	0.0	0.0	5.3	5.7	0.0	9.0	8.5	8.0
New Construction	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1
Total Reconstruction	0.0	0.0	20.1	19.4	0.0	21.0	27.0	26.6
Total Bridge	0.0	0.0	7.7	4.7	0.0	31.9	6.1	7.9
Safety/Traffic Ops/ TSM	0.0	0.0	3.4	3.1	0.0	5.0	7.0	7.1
Environmental	0.0	0.0	0.3	0.3	0.0	0.6	0.6	0.4
Total Maintenance	0.0	0.0	61.4	64.9	0.0	30.6	48.1	47.0
TOTAL	**0.0**	**0.0**	**100.1**	**100.0**	**0.0**	**100.2**	**100.0**	**100.0**

PA = Principal Arterial
MiA = Minor Arterial
MC = Major Collector
MiC = Minor Collector
OF = Other Freeway
UC = Urban Collector

TABLE A-26. NORTH CAROLINA ROADWAY

EXPENDITURES FOR LOCAL JURISDICTION

(THOUSANDS OF DOLLARS)

		Roadway Functional Class				
		All[a]			Collector and Above	Local
Year	Local Jurisdiction	Capital	Maintenance	Total	Total	Total
1981	City	33,688	42,025	75,713		
	County[b]	0	0	0		
				75,713	10,324	65,389
1982	City	31,879	42,779	74,658		
	County	0	0	0		
				74,648	10,307	64,351
1983	City	35,164	54,270	89,434		
	County	0	0	0		
				89,434	10,307	79,127
1984	City	35,628	57,973	93,601		
	County	0	0	0		
				93,601	10,363	83,208
1985	City	36,366[c]	64,095[c]	100,461		
	County	0	0	0		
				100,461	10,313	83,208

(a) Source: Highway Statistics, 1982, 1983, 1984, 1985
(b) County Roads are under State Control
(c) Estimated using linear regression

TABLE A-27. PENNSYLVANIA ROADWAY EXPENDITURES FOR LOCAL JURISDICTION (THOUSANDS OF DOLLARS)

		Roadway Functional Class				
		All[a]			Collector and Above	Local
Year	Local Jurisdiction	Capital	Maintenance	Total	Total	Total
1981	City	76,236	102,735	178,971		
	County	54,270	119,874	174,144		
				355,115	304,007	49,108
1982	City	45,978	116,605	162,583		
	County	58,569	134,775	193,344		
				355,927	148,062	207,865
1983	City	44,049	125,801	169,850		
	County	57,434	154,087	211,521		
				381,371	349,807	31,564
1984	City	38,562	155,104	193,666		
	County	47,802	167,042	214,844		
				408,510	324,914	83,496
1985	City	35,447[b]	166,637[b]	202,084		
	County	49,384[b]	184,148[b]	233,532		
				435,616	393,245	42,371

(a) Source: Highway Statistics, 1982, 1983, 1984, 1985
(b) Estimated using linear regression

TABLE A-28. WASHINGTON ROADWAY EXPENDITURES FOR LOCAL JURISDICTION (THOUSANDS OF DOLLARS)

		Roadway Functional Class				
		All[a]			Collector and Above	Local
Year	Local Jurisdiction	Capital	Maintenance	Total	Total	Total
1981	City	95,741	33,529	129,270		
	County	37,950	92,368	130,318		
				259,588	165,834	93,754
1982	City	116,269	41,135	157,404		
	County	43,944	90,046	133,990		
				291,394	267,944	234,450
1983	City	115,305	50,526	165,831		
	County	50,064	102,117	152,181		
				218,012	257,361	60,651
1984	City	130,953	59,091	190,044		
	County	75,922	114,703	190,625		
				380,669	306,148	74,521
1985	City	140,735[b]	67,589[b]	208,324		
	County	81,979[b]	199,577[b]	281,556		
				489,880	249,322	240,558

(a) Source: Highway Statistics, 1982, 1983, 1984, 1985
(b) Estimated using linear regression

This procedure essentially created data in the format of FHWA Form 534 for each year of missing data. The local level data from this estimation procedure represented roadways of functional class collector and above.

Local Expenditures for Local Roads

The basis for the estimate of the data representing local expenditures on local roads was data presented in Highway Statistics. The data shown in Tables A-26 through A-28 represent total local highway expenditures for all roadway classes. These data are reported to the FHWA on Form 536 and is similar to the information reported on Form 534 for local jurisdictions. The primary difference between the data reported on Forms 536 and 534 is that Form 534 data represents expenditures on roadways classified as collector and above, while the Form 536 data represents all functional classes including local roadways.

The data contained in Form 536 are not reported for as many expenditure categories as the Form 534 data, and were aggregated to represent only total capital outlay and total maintenance.

The data from Highway Statistics were only available for 1981 through 1984. The data for 1985 were estimated using linear regression analysis. The annual total expenditures (capital outlay plus maintenance) for each state were regressed against year. The resulting regression equation was used to extrapolate the 1985 total expenditures for each state for all roadway classes.

The total expenses for local roadways were determined as the difference between the data reported on Form 536 and that reported on Form 534 as shown in Equation A-13, and reported in Tables A-26 through A-28.

$$T_k = (\sum_i \sum_j X_{ijk}) - Y_k \qquad \text{(A-13)}$$

where:

T_k = the aggregate capital and maintenance expenditures by local jurisdictions within a state for all local roadways, for year k,

X_{ijk} = the city or county (i) expenditures for capital and maintenance (j) during year k, obtained from Highway Statistics, and

Y_k = the total expenditures by local jurisdictions within a state for roadways classified as collectors or above, for year k, obtained from Form 534 supplied by the FHWA.

The total expenditures for local roadways were proportioned between city and county jurisdictions based on the proportions for all roadway classes as shown in Equation A-14.

$$EX_{ijk} = T_k \times (X_{ijk}/(\sum_i \sum_j (X_{ijk}))) \qquad \text{(A-14)}$$

where:

EX_{ijk} = the estimated city or county (i) proportion of total expenses for local roadways for capital or maintenance (j) during year k.

The results of the proportioning are given in Tables 29 through 31. Note that the city proportion of expenses were considered to apply to urban roadway for all cities with a population of 5,000 or more. Cities or towns with a population of less than 5,000 and all county expenditures were considered to apply to rural roadways. This is consistent with the accounting procedures used in reporting data to the FHWA. The cities and towns in Arizona with a 1985 population less than 5,000 are shown in Table A-32. This results in values for cities and counties shown in Table A-11 differing from the urban and rural values shown in Table C-4 Appendix C.

TABLE A-29. NORTH CAROLINA ESTIMATED LOCAL EXPENDITURES ON LOCAL ROADS FOR CITIES AND COUNTIES

Year	Local Jurisdiction	Total	Capital	Maintenance
1981	City	65,389	29,094	36,295
	County	0	0	0
1982	City	64,351	27,478	36,873
	County	0	0	0
1983	City	79,127	31,111	48,016
	County	0	0	0
1984	City	83,288	31,702	51,586
	County	0	0	0
1985	City	90,148	32,633	57,515
	County	0	0	0
TOTAL	City	382,303	152,019	230,284
TOTAL	County	0	0	0

TABLE A-30. PENNSYLVANIA ESTIMATED LOCAL EXPENDITURES ON LOCAL ROADS FOR CITIES AND COUNTIES

Year	Local Jurisdiction	Total	Capital	Maintenance
1981	City	49,108	10,602	14,287
	County	0	7,547	16,671
1982	City	207,865	26,852	68,099
	County	0	34,205	78,710
1983	City	31,564	3,646	10,412
	County	0	4,753	12,753
1984	City	83,596	7,891	31,470
	County	0	9,782	34,183
1985	City	42,371	3,448	16,208
	County	0	4,803	17,911
TOTAL	City	0	52,439	140,746
TOTAL	County	0	61,091	160,228

TABLE A-31. WASHINGTON ESTIMATED LOCAL EXPENDITURES ON LOCAL ROADS FOR CITIES AND COUNTIES

Year	Local Jurisdiction	Total	Capital	Maintenance
1981	City	93,754	34,578	12,109
	County	0	13,706	33,360
1982	City	23,450	9,357	3,310
	County	0	3,536	7,246
1983	City	60,651	21,991	9,636
	County	0	9,548	19,476
1984	City	74,521	25,636	11,568
	County	0	14,863	22,455
1985	City	240,558	69,109	33,190
	County	0	40,256	98,003
TOTAL	City	0	160,670	69,814
TOTAL	County	0	81,910	180,540

TABLE A-32. ARIZONA CITIES AND TOWNS LESS THAN 5,000 POPULATION (1985)

Benson
Buckeye
Carefree
Chino Valley
Clarkdale
Clifton
Colorado City
Duncan
Eager
El Mirage
Fredonia
Gila Bend
Goodyear
Guadalupe
Hayden
Huachuca City
Jerome
Kearny
Mammoth
Marana
Miami
Oro Valley
Parker
Patagonia
Pima
Pinetop-Lakeside
St. Johns
San Luis
Snowflake
Somerton
Springerville
Superior
Surprise
Taylor
Thatcher
Tolleson
Tombstone
Wellton
Wickenburg
Willcox
Williams
Winkelman
Youngtown

APPENDIX B

FUNCTIONAL SYSTEM CHARACTERISTICS

The following material is excerpted directly from the FHWA publication Highway Functional Classification--Concepts, Criteria and Procedures (FHWA, July 1974).

FUNCTIONAL SYSTEMS FOR RURAL AREAS

Rural roads consist of those facilities that are outside of small urban and urbanized areas. They are classified into four major systems: principal arterials, minor arterial roads, major and minor collector roads, and local roads.

RURAL PRINCIPAL ARTERIAL SYSTEM

The rural principal arterial system consists of a connected rural network of continuous routes having the following characteristics:

1. Serve corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel.

2. Serve all, or virtually all, urban areas with populations of 50,000 and over and a large majority of those with populations of 25,000 and over.

3. Provide an integrated network without stub connections except where unusual geographic or traffic flow conditions dictate otherwise, e.g., international boundary connections and connections to coastal cities.

In the more densely populated states, this class of highway may not include all heavily traveled routes which might warrant multilane improvements. It is likely, however, that in the majority of states the principal arterial systems will include most, if not all, existing rural freeways.

The principal arterial system is stratified into the following two categories:

Interstate System - The Interstate subclassification consists of all presently designated routes of the Interstate System.

Other principal arterials - This subclassification consists of all non-Interstate principal arterials.

RURAL MINOR ARTERIAL ROAD SYSTEM

The rural minor arterial road system should, in conjunction with the principal arterial system, form a rural network having the following characteristics:

1. Link cities and larger towns (and other traffic generators, such as major resort areas, that are capable of attracting travel over similarly long distances) and form an integrated network providing interstate and intercounty service.

2. Be spaced at such intervals--consistent with population density--so that all developed areas of the State are within a reasonable distance of an arterial highway.

3. Provide (because of the the two characteristics defined immediately above) service to corridors with trip lengths and travel density greater than those predominantly served by rural collector or local systems. Therefore, minor arterials constitute routes whose design should be expected to provide for relatively high overall travel speeds, with minimum interference to through movement.

RURAL ROAD COLLECTOR SYSTEM

The rural collector routes generally serve travel of primarily intracounty rather than statewide importance and constitute those routes on which (regardless of traffic volume) predominant travel distances are shorter than on arterial routes. Consequently, on the average, more moderate speeds may be typical.

In order to more clearly define the characteristics of rural collectors, this sytem should be subclassified according to the following criteria:

Major collector roads - These routes should: (1) Provide service to any county seat not on an arterial route, to the larger towns not directly served by the higher systems, and to other traffic generators of equivalent intracounty importance, such as consolidated schools, shipping points, county parks, important mining and agricultural areas, etc., (2) link these places with nearby larger towns or cities, or with routes of higher classification, and (3) serve the more important intracounty travel corridors.

Minor collector roads - These routes should: (1) Be spaced at intervals--consistent with population density--to collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road, (2) provide service to the remaining smaller communities, and (3) link the locally important traffic generators with their rural hinterland.

RURAL LOCAL ROAD SYSTEM

The rural local road system should have the following characteristics: (1) Serve primarily to provide access to adjacent land, and (2) provide service to travel over relatively short distances as compared to collectors or other higher systems. Local roads will, of course, constitute the rural mileage not classified as principal arterial, minor arterial roads, or collector road.

FUNCTIONAL SYSTEMS IN URBANIZED AREAS

The four functional systems for urbanized areas are urban principal arterials, minor arterial streets, collector streets, and local streets. The differences in the nature and intensity of development between rural and urban areas cause these systems to have characteristics that are somewhat different from the correspondingly named rural systems.

URBAN PRINCIPAL ARTERIAL SYSTEM

In every urban environment there exists a system of streets and highways which can be identified as unusally significant to the area in which it lies in terms of the nature and composition of travel it serves. In smaller urban areas (under 50,000) these facilities may be very limited in number and extent, and their importance may be primarily derived from the service provided to travel passing through the area. In larger urban areas their importance is also derived from service to rural oriented traffic, but equally or even more important, from service for major movements within these urbanized areas.

This system of streets and highways--the urban principal arterial system--should serve the major centers of activity of a metropolitan area, the highest traffic

volume corridcrs, and the longest trip desires, and should carry a high proportion of the total urban area travel on a minimum of mileage. The system should be integrated, both internally and between major rural connections.

The principal arterial system should carry the major portion of trips entering and leaving the urban area, as well as the majority of through movements desiring to bypass the central city. In addition, significant intra-area travel, such as between major inner city communities, or between major suburban centers should be served by this class of facilities. Frequently the principal arterial system will carry important intraurban as well as intercity bus routes. Finally, this system in urbanized areas should provide continuity for all rural arterials which intercept the urban boundary.

Because of the nature of the travel served by the principal arterial system, almost all fully and partially controlled access facilities will be part of this functional class. However, this system is not restricted to controlled access facilities. The principal arterial system should be stratified as follows: (1) interstate, (2) other freeways and expressways, and (3) other principal arterials (with no control of access).

URBAN MINOR ARTERIAL STREET SYSTEM

The minor arterial street system should interconnect with and augment the urban principal arterial system and provide service to trips of moderate length at a somewhat lower level of travel mobility than major arterials. This system also distributes travel to geographic areas smaller than those identified with the higher system.

The minor arterial street system includes all arterials not classified as principal and contains facilities that place more emphasis on land access than the higher system, and offer a lower level of traffic mobility. Such facilities may carry local bus routes and provide intracommunity continuity, but ideally should not penetrate identifiable neighborhoods. This system should include urban connections to rural collector roads where such connections have not been classified for internal reasons as urban principal arterials.

URBAN COLLECTOR STREET SYSTEM

The collector street system provides both land access service and traffic circulation within residential neighborhoods, commercial areas and industrial areas. It differs from the arterial system in that facilities on the collector system may penetrate residential neighborhoods, distributing trips from the arterials through the area to the ultimate destination. Conversely, the collector street also collects traffic from local streets in residential neighborhoods and channels it into the arterial system. In the central business district, and in other areas of like development and traffic density, the collector system may include the street grid which forms a logical entity for traffic circulation.

URBAN LOCAL STREET SYSTEM

The local street system comprises all facilities not on one of the higher systems. It serves primarily to provide direct access to abutting land and access to the higher order systems. It offers the lowest level of mobility and usually contains no bus routes. Service to through traffic movement usually is deliberately discouraged.

APPENDIX C

PROGRAM DOCUMENTATION
FEDERAL-STATE HIGHWAY EXPENDITURE
DISTRIBUTION SPEADSHEET
(F-SHEDS)

INTRODUCTION

The Federal-State Highway Expenditure Distribution Spreadsheet (F-SHEDS) was created as part of the Study of Potential Impacts of Limiting the Federal-Aid Highway Program to Routes of Interstate Significance. The spreadsheet provides state officials with the ability to analyze highway funding source alternatives on a microscopic scale. With F-SHEDS, the user will be able to allocate funding responsibilities between the federal, state, and local governments by roadway functional classification and expenditure category.

The functional classifications used in F-SHEDS are similar to those used by FHWA for expenditure reporting in the Highway Statistics publication. The difference is that the small and large urban functional classes have been combined into a single set of urban functional classes. The functional classifications used in F-SHEDS are listed in Table C-1.

TABLE C-1. F-SHEDS FUNCTIONAL CLASSIFICATIONS

Rural	Urban
Interstate	Interstate
Other Principal Arterial	Other Freeway and Expressway
Minor Arterial	Other Principal Arterial
Major Collector	Minor Arterial
Minor Collector	Collector
Local	Local

The expenditure categories used in F-SHEDS are a condensed version of the categories used by FHWA for expenditure reporting in the Highway Statistics

publication. The primary headings in Table C-2 list the expenditures used in F-SHEDS. If a particular expenditure is a combination of more specific expenditure categories, the latter categories are listed using indentation.

TABLE C-2. F-SHEDS EXPENDITURE CATEGORIES

- Right-of-Way
- Preliminary Engineering
- New Construction
- Reconstruction
  - Relocation
  - Reconstruction
  - Major Widening
  - Minor Widening
  - Restoration and Rehabilitation
  - Resurfacing
- Bridges
  - New Bridges
  - Bridge Replacement
  - Major Bridge Rehabilitation
  - Minor Bridge Rehabilitation
- Safety-Traffic Operations-Transportation Systems Management
- Environmental Preservation
- Maintenance
  - Traffic Services
  - Physical Maintenance

The expenditures for each functional class and each spending category are further broken down into six project/system classifications. These classifications have three levels of subdivision and are listed in Table C-3.

TABLE C-3. F-SHEDS PROJECT/SYSTEM CLASSIFICATIONS

- Federal/State Participation
  - Federal-Aid Highway System
    - Federal-Aid Project
    - Non-Federal-Aid Project
  - Non-Federal-Aid System
- Federal/Local Participation
  - Federal-Aid Highway System
    - Federal-Aid Project
    - Non-Federal-Aid Project
  - Non-Federal-Aid System

DEFINITION OF TERMINOLOGY

Federal/State Participation - These projects are funded either entirely by the state, or jointly by the federal and state governments using a federally-defined matching ratio. Highways funded are typically part of the designated state highway system. Interstate highways are normally included in state highway systems.

Federal/Local Participation - These projects are funded either entirely by local jurisdictions, or jointly by the federal and local governments using a federally-defined matching ratio. Highways funded in these ways are typically part of the highway system for a local jurisdiction.

Federal-Aid Highway System (FAS) - Projects for the highways in this system may be eligible for partial federal funding using a federally-defined matching ratio. The magnitude of the matching ratio depends on the expenditure category.

Non-Federal-Aid Highway System - Projects for the highways in this system are not eligible for federal funding. Funding must be provided entirely by the state or local jurisdiction in control.

Federal-Aid Project (FAP) - A project performed on part of the federal-aid system that was partially funded by the Federal Government using a federally-defined matching ratio.

Non-Federal-Aid Project - A project performed on part of the federal-aid system that received no federal funding.

SPREADSHEET LAYOUT

A complete printout of the F-SHEDS spreadsheet for the State of Arizona is included in this appendix (see Table C-4). The complete spreadsheet consists of 146 rows and 21 columns of information. The first column lists the rural and urban functional classes. Under each functional class, the eight spending categories are listed. In the case of Arizona, the rural and urban local functional class includes all eight expenditure categories. For other states, detailed information about expenditures on local roads was not available. As a result, only capital outlay and maintenance expenditures are reported. The capital outlay expenditure includes all eight of the expenditure categories except maintenance. The other 20 columns contain numeric information including raw expenditure data and the computational algorithm required to break these raw expenditures up into a federal, state, and local component.

The first six columns of numeric information contain the total expenditures for the given functional class, spending category, and system/project type during the inclusive period from 1981 to 1985. The first three columns are federal/state expenditures. The last three columns are federal/local expenditures.

The next seven columns break down the expenditure data into federal, state, and local portions according to current federal funding ratios. The current conditions are referred to as the "Existing Conditions" in the table and are designated to be "Scenario Zero." An abbreviated matrix describing the existing conditions for North Carolina, Pennsylvania, and Washington is included in Tables C-5 through C-7. The funding ratios are the proportions of the federal-aid system/federal-aid project dollars that were paid for by the Federal Government. The actual ratios for each spending category appear under the column marked "Percent Federal Dollars" under Scenario Zero. The computed total federal participation appears in the next column. The total state participation consists of all federal/state participation dollars except that portion of the federal/state FAS/FAP dollars paid for by the Federal Government. The total local participation consists of all federal/local participation dollars except for that portion of the federal/local FAS/FAP dollars paid for by the Federal Government.

The three columns containing percentages give the proportions of total expenditures funded by that level of government for each expenditure category. The last row of information for each functional class gives total expenditures and the overall funding responsibility proportions for that functional class. Similar totals are provided for all rural and all urban functional classes, as well as a grand total for all functional classes.

The next seven columns of numeric information encompass the user-defined funding scenario algorithm. The heading for these seven columns (currently marked "Scenario 3B") may be changed to reflect whatever funding proportion scheme is provided by the user. The user selects funding schemes by changing the federal matching ratios in the column marked "Percent Federal Dollars." When the spreadsheet is recalculated, the expenditures are proportioned based upon the user-supplied matching ratios. Totals for each functional class, the rural and urban totals, and the grand totals are computed just as those in Scenario Zero.

TIPS FOR LOTUS 1-2-3 and SYMPHONY USERS

- F-SHEDS was written using Lotus Symphony Version 1.2. If you are using Lotus 123 or another version of Symphony, it may be necessary to use the file conversion utility to make F-SHEDS compatible with your software.

- For purposes of easy reference, it is recommended that the first column and the first eight rows of the F-SHEDS spreadsheet be set up as titles using the appropriate title command.

- Note that when new percentages are entered into the user scenario section of the worksheet, the new funding splits must be recalculated using the appropriate recalculation function key. (For Symphony, use "F8".) Check your Lotus 123 or Symphony manual for details.

- Note that the data and formulas in the F-SHEDS spreadsheet have not been "protected" or "locked". If you should inadvertently destroy the contents of a raw data cell or a formula cell, do not save the altered spreadsheet. Simply load the disk copy of the spreadsheet, thus overwriting the altered spreadsheet, and start over.

- The Lotus 123 and Symphony print commands provide a wide range of flexibility as to what rows and columns may be printed and what headers may be used. The sample printout at the end of this report uses columns 1 through 7 and rows 1 through 8 as title headers for each page. The user may choose to omit printing the seven columns of Scenario Zero, and print only the user-defined scenarios.

TABLE C-4. ARIZONA SPREADSHEET

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985)

SCENARIO 0 — EXISTING CONDITIONS

SCENARIO 3B — FEDERAL RESPONSIBILITY FOR INTERSTATES PLUS ALL OF BOTH RURAL PRINCIPAL ARTERIALS AND URBAN FREEWAYS

STATE OF ARIZONA (THOUSANDS OF DOLLARS)	FEDERAL/STATE (141) FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL/STATE (141) FEDERAL AID SYSTEM NON FED AID PROJ	FEDERAL/STATE (141) NON FEDERAL AID SYSTEM	FEDERAL/LOCAL (142) FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL/LOCAL (142) FEDERAL AID SYSTEM NON FED AID PROJ	FEDERAL/LOCAL (142) NON FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
RURAL INTERSTATE																				
RIGHT OF WAY	14357	461	0	0	0	0	94.27%	13535	1283	0	91.34%	8.66%	0.00%	100.00%	14818	0	0	100.00%	0.00%	0.00%
PRELIM ENGIN	29396	1363	0	0	0	0	94.27%	27711	3048	0	90.09%	9.91%	0.00%	100.00%	30759	0	0	100.00%	0.00%	0.00%
NEW CONSTRUCT	93367	0	0	0	0	0	94.27%	88018	5350	0	94.27%	5.73%	0.00%	100.00%	93367	0	0	100.00%	0.00%	0.00%
TOT RECONSTRUCT	133687	624	0	0	0	0	94.27%	126028	8284	0	93.83%	6.17%	0.00%	100.00%	134311	0	0	100.00%	0.00%	0.00%
TOTAL BRIDGE	6900	699	0	0	0	0	80.00%	5520	2079	0	72.64%	27.36%	0.00%	100.00%	7599	0	0	100.00%	0.00%	0.00%
SFTY/TRF-OP/TSM	37443	375	0	0	0	0	90.00%	33698	4119	0	89.11%	10.89%	0.00%	100.00%	37818	0	0	100.00%	0.00%	0.00%
ENVIRONMENTAL	2088	0	0	0	0	0	94.27%	1968	120	0	94.27%	5.73%	0.00%	100.00%	2088	0	0	100.00%	0.00%	0.00%
TOT MAINTENANCE	0	0	46799	0	0	0		0	46799	0	0.00%	100.00%	0.00%	100.00%	46799	0	0	100.00%	0.00%	0.00%
TOTAL *****	317237	3522	46799	0	0	0		296478	71082	0	80.66%	19.34%	0.00%		367558	0	0	100.00%	0.00%	0.00%
RURAL OTHER PRINCIPAL ARTERIAL																				
RIGHT OF WAY	1309	6442	0	134	0	0	92.40%	1334	6540	10	16.92%	82.95%	0.13%	100.00%	7885	0	0	100.00%	0.00%	0.00%
PRELIM ENGIN	2998	2988	0	325	807	0	92.40%	3073	3213	911	42.69%	44.64%	12.66%	100.00%	7197	0	0	100.00%	0.00%	0.00%
NEW CONSTRUCT	29	0	0	0	0	0	92.40%	27	2	0	92.40%	7.52%	0.00%	100.00%	29	0	0	100.00%	0.00%	0.00%
TOT RECONSTRUCT	45081	20149	0	1865	5785	0	94.27%	44275	38732	5883	54.73%	37.99%	7.28%	100.00%	80900	0	0	100.00%	0.00%	0.00%
TOTAL BRIDGE	129	0	0	538	0	0	80.00%	534	26	108	80.00%	3.87%	16.13%	100.00%	667	0	0	100.00%	0.00%	0.00%
SFTY/TRF-OP/TSM	1030	996	0	18	1876	0	90.00%	1753	1169	1870	36.57%	24.00%	38.96%	100.00%	4820	0	0	100.00%	0.00%	0.00%
ENVIRONMENTAL	0	0	0	0	0	0	92.40%	0	0	0	0.00%	0.00%	0.00%	100.00%	0	0	0	0.00%	0.00%	0.00%
TOT MAINTENANCE	0	0	33787	0	0	48732		0	33787	48732	0.00%	40.94%	59.06%	100.00%	82519	0	0	100.00%	0.00%	0.00%
TOTAL *****	51475	30574	33787	2980	8548	48732		50095	75480	57532	27.71%	41.02%	31.26%		184017	0	0	100.00%	0.00%	0.00%
RURAL MINOR ARTERIAL																				
RIGHT OF WAY	1810	844	0	44	0	0	92.40%	1722	981	3	63.63%	36.25%	0.12%	0.00%	0	2697	9	0.00%	99.66%	0.34%
PRELIM ENGIN	4439	2950	0	82	224	0	92.40%	4101	3283	230	54.33%	42.67%	2.99%	0.00%	0	7190	504	0.00%	93.45%	6.55%
NEW CONSTRUCT	0	1	0	0	0	0	92.40%	0	1	0	0.00%	100.00%	0.00%	0.00%	0	1	0	0.00%	100.00%	0.00%
TOT RECONSTRUCT	32886	10798	0	1446	4438	0	94.27%	32385	12874	4521	65.30%	25.57%	9.12%	0.00%	0	36530	13030	0.00%	73.71%	26.29%
TOTAL BRIDGE	6520	0	0	254	0	0	80.00%	5419	1384	51	80.00%	19.25%	0.75%	0.00%	0	6520	254	0.00%	96.25%	3.75%
SFTY/TRF-OP/TSM	1038	1033	0	2	212	0	90.00%	1656	1217	212	53.88%	39.44%	6.88%	0.00%	0	2627	458	0.00%	85.15%	14.85%
ENVIRONMENTAL	0	22	0	0	0	0	92.40%	0	22	0	0.00%	100.00%	0.00%	0.00%	0	22	0	0.00%	100.00%	0.00%
TOT MAINTENANCE	0	0	45437	0	0	14044		0	45437	14044	0.00%	75.38%	24.62%	0.00%	0	45437	14044	0.00%	75.38%	24.62%
TOTAL *****	47580	15640	45437	1828	4874	14044		45342	64919	19061	34.85%	48.89%	15.26%		0	101023	29099	0.00%	77.64%	22.36%
RURAL MAJOR COLLECTOR																				
RIGHT OF WAY	771	789	0	15078	2176	0	92.40%	15397	847	3370	78.50%	4.32%	17.18%	0.00%	0	3941	15674	0.00%	20.09%	79.91%
PRELIM ENGIN	1782	1667	0	10714	164	0	92.40%	10879	2001	1846	84.58%	8.51%	7.00%	0.00%	0	12907	10620	0.00%	54.86%	45.14%
NEW CONSTRUCT	0	0	0	18	0	0	92.40%	17	0	1	92.40%	0.00%	7.52%	0.00%	0	0	18	0.00%	0.00%	100.00%
TOT RECONSTRUCT	8944	9852	0	44826	2554	0	94.27%	50889	10304	5123	76.60%	15.68%	7.74%	0.00%	0	44287	21889	0.00%	66.92%	33.08%
TOTAL BRIDGE	4862	2989	0	860	0	0	80.00%	4578	3961	172	52.55%	45.47%	1.97%	0.00%	0	8348	363	0.00%	95.84%	4.16%
SFTY/TRF-OP/TSM	2314	390	0	8882	1332	0	90.00%	10904	622	2312	78.89%	4.49%	16.71%	0.00%	0	2932	10906	0.00%	21.19%	78.81%
ENVIRONMENTAL	0	0	0	58	0	0	92.40%	54	0	4	92.40%	0.00%	7.52%	0.00%	0	0	58	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	15683	0	0	16556		0	15683	16556	0.00%	48.65%	51.35%	0.00%	0	15683	16556	0.00%	48.65%	51.35%
TOTAL *****	18673	15887	15683	91158	6226	16556		101518	33479	29185	61.83%	20.38%	17.78%		0	88099	76083	0.00%	53.66%	46.34%

Source: JHK generated from FHWA 534 data

TABLE C-4. ARIZONA SPREADSHEET (CONTINUED)

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985)

SCENARIO 0: EXISTING CONDITIONS

SCENARIO 3D: FEDERAL RESPONSIBILITY FOR INTERSTATES PLUS ALL OF BOTH RURAL PRINCIPAL ARTERIALS AND URBAN FREEWAYS

STATE OF ARIZONA (THOUSANDS OF DOLLARS)	FEDERAL/STATE (141) FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	FEDERAL/LOCAL (142) FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	PERCENT FEDERAL	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL	PERCENT FEDERAL	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
TOT RECONSTRUCT	50285	0	0	139092	203782	0	92.48%	175136	3781	214242	46.55%	0.95%	54.49%	0.00%	0	6819	386340	0.00%	1.73%	99.27%
TOTAL BRIDGE	4520	0	0	73860	22530	0	89.00%	62880	990	37156	81.99%	0.99%	37.18%	0.00%	0	2378	97759	0.00%	2.38%	97.62%
SFTY/TRF-OP/TSM	211	0	0	15574	6204	0	90.00%	14207	21	7761	64.61%	0.10%	35.30%	0.00%	0	60	21929	0.00%	0.27%	99.73%
ENVIRONMENTAL	0	0	0	4110	0	0	92.48%	3801	0	309	92.48%	0.00%	7.52%	0.00%	0	0	4110	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	808	0	0	106306		0	808	106306	0.00%	0.75%	99.25%	0.00%	0	808	106306	0.00%	0.75%	99.25%
TOTAL *****	58445	249	808	514765	331920	106306		520032	6021	466442.0	51.36%	0.59%	48.04%		0	11917	1000580	0.00%	1.18%	98.82%
URBAN MINOR ARTERIAL																				
RIGHT OF WAY	598	74	0	15332	3356	0	92.48%	14732	110	4509	76.10%	0.61%	23.29%	0.00%	0	498	18862	0.00%	2.57%	97.43%
PRELIM ENGIN	0	451	0	8096	7254	0	92.48%	7487	451	7063	47.38%	2.85%	49.76%	0.00%	0	857	14944	0.00%	5.42%	94.58%
NEW CONSTRUCT	0	87	0	6204	17724	0	92.48%	5737	87	18193	23.89%	0.36%	75.75%	0.00%	0	114	23991	0.00%	0.48%	99.52%
TOT RECONSTRUCT	5159	0	0	53290	73178	0	92.48%	54054	388	77185	41.87%	0.29%	58.04%	0.00%	0	658	130969	0.00%	0.50%	99.50%
TOTAL BRIDGE	664	0	0	11410	27804	0	88.00%	9666	133	30008	24.23%	0.33%	75.43%	0.00%	0	175	39711	0.00%	0.44%	99.56%
SFTY/TRF-OP/TSM	24	0	0	2722	2238	0	90.00%	2471	2	2510	49.50%	0.05%	50.37%	0.00%	0	5	4979	0.00%	0.10%	99.90%
ENVIRONMENTAL	130	0	0	2694	66	0	92.48%	2612	10	269	90.37%	0.34%	9.29%	0.00%	0	101	2789	0.00%	3.51%	96.49%
TOT MAINTENANCE	0	0	0	0	0	12260		0	0	12260	0.00%	0.00%	100.00%	0.00%	0	0	12260	0.00%	0.00%	100.00%
TOTAL *****	6575	612	0	99756	131620	12260		88758	1130	152074.1	38.58%	0.47%	60.95%		0	2409	248414	0.00%	0.96%	99.04%
URBAN COLLECTOR																				
RIGHT OF WAY	2820	0	0	4962	10016	0	92.48%	7204	213	10309	40.46%	1.19%	58.35%	0.00%	0	357	17449	0.00%	2.01%	97.99%
PRELIM ENGIN	0	41	0	2962	10396	0	92.48%	1907	41	10551	15.26%	0.33%	84.42%	0.00%	0	48	12451	0.00%	0.39%	99.61%
NEW CONSTRUCT	1904	0	0	16896	41084	0	92.48%	17308	143	42355	29.04%	0.24%	70.72%	0.00%	0	202	59684	0.00%	0.34%	99.66%
TOT RECONSTRUCT	509	0	0	8490	63264	0	92.48%	6473	30	65752	9.21%	0.05%	90.73%	0.00%	0	42	70221	0.00%	0.06%	99.94%
TOTAL BRIDGE	0	0	0	10002	19150	0	88.00%	15842	0	22910	39.63%	0.00%	60.37%	0.00%	0	0	37952	0.00%	0.00%	100.00%
SFTY/TRF-OP/TSM	0	0	0	1900	6926	0	90.00%	1717	0	7117	19.44%	0.00%	80.56%	0.00%	0	0	8834	0.00%	0.00%	100.00%
ENVIRONMENTAL	0	0	0	0	1502	0	92.48%	0	0	1502	0.00%	0.00%	100.00%	0.00%	0	0	1502	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	0	0	0	41670		0	0	41670	0.00%	0.00%	100.00%	0.00%	0	0	41670	0.00%	0.00%	100.00%
TOTAL *****	5241	41	0	51122	152330	41670		49731	435	200246.1	19.06%	0.17%	79.87%		0	649	249763	0.00%	0.26%	99.74%
URBAN LOCAL																				
RIGHT OF WAY	0	0	0	0	0	8006	92.48%	0	0	8006	0.00%	0.00%	100.00%	0.00%	0	0	8006	0.00%	0.00%	100.00%
PRELIM ENGIN	0	0	0	0	0	18610	92.48%	0	0	18610	0.00%	0.00%	100.00%	0.00%	0	0	18510	0.00%	0.00%	100.00%
NEW CONSTRUCT	0	0	0	0	0	209396	92.48%	0	0	209396	0.00%	0.00%	100.00%	0.00%	0	0	209396	0.00%	0.00%	100.00%
TOT RECONSTRUCT	0	0	0	0	0	134054	92.48%	0	0	134054	0.00%	0.00%	100.00%	0.00%	0	0	134054	0.00%	0.00%	100.00%
TOTAL BRIDGE	0	0	0	0	0	472	88.00%	0	0	472	0.00%	0.00%	100.00%	0.00%	0	0	472	0.00%	0.00%	100.00%
SFTY/TRF-OP/TSM	0	0	0	0	0	16280	90.00%	0	0	16280	0.00%	0.00%	100.00%	0.00%	0	0	16280	0.00%	0.00%	100.00%
ENVIRONMENTAL	0	0	0	0	0	9054	92.48%	0	0	9054	0.00%	0.00%	100.00%	0.00%	0	0	9054	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	0	0	0	166170		0	0	166170	0.00%	0.00%	100.00%	0.00%	0	0	166170	0.00%	0.00%	100.00%
TOTAL *****	0	0	0	0	0	642050		0	0	642050	0.00%	0.00%	100.00%		0	0	642050	0.00%	0.00%	100.00%
URBAN TOTAL	386793	77044	5819	685843	615878	802286		962541	109308	1481619	37.70%	4.28%	58.02%		397681	14975	2140806	15.57%	0.59%	83.84%
GRAND TOTAL	821681	150681	161291	761527	635526	1233930		1456875	368057	1939711	38.70%	9.78%	51.52%		949257	217878	2597310	25.22%	5.79%	69.00%

Source: JHK generated from FHWA 534 data

TABLE C-4. ARIZONA SPREADSHEET (CONTINUED)

SUMMARY OF FIVE YEAR TOTALS (1981 - 1985)
HIGHWAY EXPENDITURES — FEDERAL/STATE (141) — FEDERAL/LOCAL (142)

SCENARIO 0
EXISTING CONDITIONS

SCENARIO 3B
FEDERAL RESPONSIBILITY FOR INTERSTATES PLUS ALL OF BOTH RURAL PRINCIPAL ARTERIALS AND URBAN FREEWAYS

STATE OF ARIZONA (THOUSANDS OF DOLLARS)	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	FEDERAL AID SYSTEM	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	FEDERAL AID SYSTEM	PERCENT FEDERAL	TOTAL FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL	PERCENT FEDERAL	TOTAL FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
RURAL MINOR COLLECTOR																						
RIGHT OF WAY	2	0	1256	0	0	934	92.48%	2	1256	934	0.00%	57.31%	42.80%	0.00%	0	1257	935	0.00%	57.36%	42.64%
PRELIM ENGIN	0	14	835	0	0	1258	92.48%	0	849	1258	0.00%	34.02%	65.98%	0.00%	0	849	1258	0.00%	34.02%	65.98%
NEW CONSTRUCT	0	0	0	0	0	626	92.48%	0	0	626	0.00%	0.00%	100.00%	0.00%	0	0	626	0.00%	0.00%	100.00%
TOT RECONSTRUCT	0	0	5154	0	0	13974	94.27%	0	5154	13974	0.00%	26.94%	73.06%	0.00%	0	5154	13974	0.00%	26.94%	73.06%
TOTAL BRIDGE	0	0	2705	0	0	29944	90.00%	0	2705	29944	0.00%	8.28%	91.72%	0.00%	0	2705	29944	0.00%	8.28%	91.72%
SFTY/TRF-OP/TSM	0	0	969	0	0	2570	90.00%	0	969	2570	0.00%	27.38%	72.62%	0.00%	0	969	2570	0.00%	27.38%	72.62%
ENVIRONMENTAL	0	0	0	0	0	16	92.48%	0	0	16	0.00%	0.00%	100.00%	0.00%	0	0	16	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	3047	0	0	25652		0	3047	25652	0.00%	10.62%	89.38%	0.00%	0	3047	25652	0.00%	10.62%	89.38%
TOTAL *****	2	14	13765	0	0	73978		2	13779	74978	0.00%	15.52%	84.47%		0	13781	74977	0.00%	15.53%	84.47%
RURAL LOCAL																						
RIGHT OF WAY	0	0	0	0	0	1110	92.48%	0	0	1110	0.00%	0.00%	100.00%	0.00%	0	0	1110	0.00%	0.00%	100.00%
PRELIM ENGIN	0	0	0	0	0	11968	92.48%	0	0	11968	0.00%	0.00%	100.00%	0.00%	0	0	11968	0.00%	0.00%	100.00%
NEW CONSTRUCT	0	0	0	0	0	89682	92.48%	0	0	89682	0.00%	0.00%	100.00%	0.00%	0	0	89682	0.00%	0.00%	100.00%
TOT RECONSTRUCT	0	0	0	0	0	39468	94.27%	0	0	39468	0.00%	0.00%	100.00%	0.00%	0	0	39468	0.00%	0.00%	100.00%
TOTAL BRIDGE	0	0	0	0	0	1016	90.00%	0	0	1016	0.00%	0.00%	100.00%	0.00%	0	0	1016	0.00%	0.00%	100.00%
SFTY/TRF-OP/TSM	0	0	0	0	0	4510	90.00%	0	0	4510	0.00%	0.00%	100.00%	0.00%	0	0	4510	0.00%	0.00%	100.00%
ENVIRONMENTAL	0	0	0	0	0	750	92.48%	0	0	750	0.00%	0.00%	100.00%	0.00%	0	0	750	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	0	0	0	128040		0	0	128040	0.00%	0.00%	100.00%	0.00%	0	0	128040	0.00%	0.00%	100.00%
TOTAL *****	0	0	0	0	0	276544		0	0	276544	0.00%	0.00%	100.00%		0	0	276544	0.00%	0.00%	100.00%
RURAL TOTAL	634800	73037	155472	95804	18648	431652		494336	258749	458098	40.81%	21.36%	37.82%		551375	202902	456703	45.34%	16.75%	37.71%
URBAN INTERSTATE																						
RIGHT OF WAY	31342	373	0	0	0	0	94.27%	29546	2189	0	93.10%	6.84%	0.00%	100.00%	31716	0	0	100.00%	0.00%	0.00%
PRELIM ENGIN	28497	1514	0	0	0	0	94.27%	26864	3147	0	89.51%	10.49%	0.00%	100.00%	30011	0	0	100.00%	0.00%	0.00%
NEW CONSTRUCT	82534	0	0	0	0	0	94.27%	77805	4729	0	94.27%	5.73%	0.00%	100.00%	82534	0	0	100.00%	0.00%	0.00%
TOT RECONSTRUCT	45140	19471	0	0	0	0	94.27%	42554	22057	0	65.86%	34.14%	0.00%	100.00%	64611	0	0	100.00%	0.00%	0.00%
TOTAL BRIDGE	0	0	0	0	0	0	90.00%	0	0	0	0.00%	0.00%	0.00%	100.00%	0	0	0	0.00%	0.00%	0.00%
SFTY/TRF-OP/TSM	9864	2558	0	0	0	0	90.00%	8878	3543	0	71.48%	28.52%	0.00%	100.00%	12420	0	0	100.00%	0.00%	0.00%
ENVIRONMENTAL	10346	0	0	0	0	0	94.27%	9753	593	0	94.27%	5.73%	0.00%	100.00%	10346	0	0	100.00%	0.00%	0.00%
TOT MAINTENANCE	0	0	2628	0	0	0		0	2628	0	0.00%	100.00%	0.00%	100.00%	2628	0	0	100.00%	0.00%	0.00%
TOTAL *****	207723	23915	2628	0	0	0		195599	38856	0	83.41%	16.59%	0.00%		234245	0	0	100.00%	0.00%	0.00%
URBAN OTHER FREEWAY AND EXPRESSWAY																						
RIGHT OF WAY	8548	45581	0	0	0	0	92.48%	7906	46224	0	14.60%	85.40%	0.00%	100.00%	54127	0	0	100.00%	0.00%	0.00%
PRELIM ENGIN	19567	878	0	0	0	0	92.48%	18096	2347	0	88.52%	11.48%	0.00%	100.00%	20443	0	0	100.00%	0.00%	0.00%
NEW CONSTRUCT	66647	3273	0	0	0	0	92.48%	61635	8285	0	88.15%	11.85%	0.00%	100.00%	69920	0	0	100.00%	0.00%	0.00%
TOT RECONSTRUCT	13136	272	0	0	0	0	92.48%	12148	1260	0	90.60%	9.40%	0.00%	100.00%	13408	0	0	100.00%	0.00%	0.00%
TOTAL BRIDGE	0	0	0	0	0	0	90.00%	0	0	0	0.00%	0.00%	0.00%	100.00%	0	0	0	0.00%	0.00%	0.00%
SFTY/TRF-OP/TSM	112	2225	0	0	0	0	90.00%	101	2236	0	4.31%	95.69%	0.00%	100.00%	2337	0	0	100.00%	0.00%	0.00%
ENVIRONMENTAL	797	0	0	0	0	0	92.48%	737	60	0	92.48%	7.52%	0.00%	100.00%	797	0	0	100.00%	0.00%	0.00%
TOT MAINTENANCE	0	0	2384	0	0	0		0	2384	0	0.00%	100.00%	0.00%	100.00%	2384	0	0	100.00%	0.00%	0.00%
TOTAL *****	108805	52227	2384	0	0	0		100820	62708	0	61.57%	38.43%	0.00%		163416	0	0	100.00%	0.00%	0.00%
URBAN OTHER PRINCIPAL ARTERIAL																						
RIGHT OF WAY	1011	51	0	133533	30928	0	92.48%	179914	127	54408	76.72%	0.05%	23.23%	0.00%	0	546	233975	0.00%	0.23%	99.77%
PRELIM ENGIN	2422	198	0	63190	21594	0	92.48%	66227	388	26793	70.98%	0.41%	28.59%	0.00%	0	1307	92098	0.00%	1.40%	98.60%
NEW CONSTRUCT	0	0	0	28184	37878	0	92.48%	18068	0	38394	32.15%	0.00%	67.85%	0.00%	0	0	58062	0.00%	0.00%	100.00%

Source: JHK generated from FHWA 534 data

TABLE C-5. NORTH CAROLINA DATA

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985) — SCENARIO 0 EXISTING CONDITIONS

STATE OF NORTH CAROLINA DOLLARS	FEDERAL/STATE (141) FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL/STATE (141) FEDERAL AID SYSTEM NON FED AID PROJ	FEDERAL/STATE (141) NON FEDERAL AID SYSTEM	FEDERAL/LOCAL (142) FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL/LOCAL (142) FEDERAL AID SYSTEM NON FED AID PROJ	FEDERAL/LOCAL (142) NON FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
RURAL INTERSTATE													
RIGHT OF WAY	36538682	109947	0	0	0	0	94.27%	34445016	2203613	0	93.39%	6.01%	0.00%
PRELIM ENGIN	26111591	159793	0	0	0	0	94.27%	24615397	1655987	0	93.70%	6.30%	0.00%
NEW CONSTRUCT	144016702	3877919	0	0	0	0	94.27%	135764545	12130076	0	91.80%	8.20%	0.00%
TOT RECONSTRUCT	52182327	1925710	0	0	0	0	94.27%	49116064	4911173	0	90.91%	9.09%	0.00%
TOTAL BRIDGE	590421	0	0	0	0	0	80.00%	472337	118084	0	80.00%	20.00%	0.00%
SFTY/TRF-OP/TSM	25793463	297260	0	0	0	0	90.00%	23214117	2876606	0	88.97%	11.03%	0.00%
ENVIRONMENTAL	21552540	863407	0	0	0	0	94.27%	20317579	2098368	0	90.64%	9.36%	0.00%
TOT MAINTENANCE	0	35045775	0	0	0	0		0	35045775	0	0.00%	100.00%	0.00%
TOTAL *****	306705726	42279811	0	0	0	0		287945854	61039683	0	82.51%	17.49%	0.00%
RURAL OTHER PRINCIPAL ARTERIAL													
RIGHT OF WAY	38754659	16240116	0	0	1305	0	92.48%	35840389	19154466	1305	65.17%	34.83%	0.00%
PRELIM ENGIN	19725804	5391026	0	0	1557	0	92.48%	18241758	6874352	1557	72.63%	27.37%	0.01%
NEW CONSTRUCT	119912715	45478239	0	0	0	0	92.48%	110895279	54495675	0	67.05%	32.95%	0.00%
TOT RECONSTRUCT	96284643	40849139	0	0	51055	0	94.27%	90767533	46366249	51055	66.16%	33.80%	0.04%
TOTAL BRIDGE	9891749	464135	0	0	0	0	80.00%	7913399	2442485	0	76.41%	23.59%	0.00%
SFTY/TRF-OP/TSM	5554446	3262553	0	0	643	0	90.00%	4999001	3817998	643	56.69%	43.30%	0.01%
ENVIRONMENTAL	67749	695276	0	0	0	0	92.48%	62654	700371	0	8.21%	91.79%	0.00%
TOT MAINTENANCE	0	53943487	0	0	83373	0		0	53943487	83373	0.00%	99.85%	0.15%
TOTAL *****	290191045	166323971	0	0	137933	0		268719933	187795083	137933	58.85%	41.12%	0.03%
RURAL MINOR ARTERIAL													
RIGHT OF WAY	4137372	1220708	0	0	1262	0	92.48%	3826242	1531830	1262	71.39%	28.58%	0.02%
PRELIM ENGIN	12137524	227929	0	0	1497	0	92.48%	11224782	1140671	1497	90.76%	9.22%	0.01%
NEW CONSTRUCT	9632841	5936387	0	0	0	0	92.48%	8908451	6660777	0	57.22%	42.78%	0.00%
TOT RECONSTRUCT	23779829	18120206	0	0	49143	0	94.27%	22417245	19482790	49143	53.44%	46.44%	0.12%
TOTAL BRIDGE	15664258	326588	0	0	0	0	80.00%	12531406	3459440	0	78.37%	21.63%	0.00%
SFTY/TRF-OP/TSM	208035	940588	0	0	630	0	90.00%	187232	961392	630	16.29%	83.65%	0.05%
ENVIRONMENTAL	0	34544	0	0	0	0	92.48%	0	34544	0	0.00%	100.00%	0.00%
TOT MAINTENANCE	0	38367406	0	0	80258	0		0	38367406	80258	0.00%	99.79%	0.21%
TOTAL *****	65559859	65174356	0	0	132789	0		59095358	71638857	132789	45.16%	54.74%	0.10%
RURAL MAJOR COLLECTOR													
RIGHT OF WAY	21542536	2935059	95931	0	8494	0	92.48%	19922537	4650989	8494	81.05%	18.92%	0.03%
PRELIM ENGIN	27078859	486253	231062	0	10140	0	92.48%	25041781	2753584	10140	90.06%	9.90%	0.04%
NEW CONSTRUCT	27234548	1857468	0	0	0	0	92.48%	25186510	3905586	0	86.58%	13.42%	0.00%
TOT RECONSTRUCT	52992553	89870279	1213815	0	331936	0	94.27%	49871237	94115410	331936	34.56%	65.21%	0.23%
TOTAL BRIDGE	42917653	4469292	3022622	0	0	0	80.00%	34334122	16075445	0	68.11%	31.89%	0.00%
SFTY/TRF-OP/TSM	3238587	5404253	369431	0	4328	0	90.00%	2914728	6097543	4328	32.33%	67.63%	0.05%
ENVIRONMENTAL	0	526546	0	0	0	0	92.48%	0	526546	0	0.00%	100.00%	0.00%
TOT MAINTENANCE	0	177948626	0	0	544518	0		0	177948626	544518	0.00%	99.69%	0.31%
TOTAL *****	174913927	283497776	4932861	0	899416	0		157270915	306873649	899416	33.88%	65.93%	0.19%

Source: JHK generated from FHWA 534 data

TABLE C-5. NORTH CAROLINA DATA (CONTINUED)

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985)

SCENARIO 0 — EXISTING CONDITIONS

STATE OF NORTH CAROLINA

DOLLARS	FEDERAL/STATE (141) FED AID PROJECT	FED/STATE (141) NON FED AID PROJ	FED/STATE (141) NON FEDERAL AID SYSTEM	FEDERAL/LOCAL (142) FED AID PROJECT	FED/LOCAL (142) NON FED AID PROJ	FED/LOCAL (142) NON FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
RURAL MINOR COLLECTOR													
RIGHT OF WAY	200041	0	3531609	0	0	3927	92.48%	258982	3552668	3927	6.79%	93.11%	0.10%
PRELIM ENGIN	1150261	0	2601046	0	0	5297	92.48%	1063761	2687546	5297	28.32%	71.54%	0.14%
NEW CONSTRUCT	198140	0	23117	0	0	3	92.48%	183240	38017	0	82.82%	17.18%	0.00%
TOT RECONSTRUCT	12613	0	40312140	0	0	166675	94.27%	11890	40312263	166675	0.03%	99.56%	0.41%
TOTAL BRIDGE	3367942	0	13957677	0	0	0	80.00%	2694354	14631265	0	15.55%	84.45%	0.00%
SFTY/TRF-OP/TSM	273401	0	1651697	0	0	1922	90.00%	246061	1679037	1922	12.77%	87.13%	0.10%
ENVIRONMENTAL	0	0	5457	0	0	0	92.48%	0	5457	0	0.00%	100.00%	0.00%
TOT MAINTENANCE	0	44717576	29875112	0	286278	0		0	74592688	286278	0.00%	99.62%	0.38%
TOTAL *****	5282398	44717576	91957855	0	286278	177820		4458288	137499541	464097.81	3.13%	96.54%	0.33%
RURAL LOCAL													
CAPITAL OUTLAY	0	0	0	0	0	0	92.48%	0	0	0	0.00%	0.00%	0.00%
TOT MAINTENANCE	0	0	0	0	0	0		0	0	0	0.00%	0.00%	0.00%
TOTAL *****	0	0	0	0	0	0		0	0	0	0.00%	0.00%	0.00%
RURAL TOTAL	842652955	601993490	96899716	0	1456416	177820		777490348	764046813	1634236	50.38%	49.51%	0.11%
URBAN INTERSTATE													
RIGHT OF WAY	27511481	12039	0	0	0	0	94.27%	25935073	1588447	0	94.23%	5.77%	0.00%
PRELIM ENGIN	5920940	173411	0	0	0	0	94.27%	5581670	512681	0	91.59%	8.41%	0.00%
NEW CONSTRUCT	37451494	417160	0	0	0	0	94.27%	35305523	2563139	0	93.23%	6.77%	0.00%
TOT RECONSTRUCT	34081756	518766	0	0	0	0	94.27%	32128871	2471651	0	92.86%	7.14%	0.00%
TOTAL BRIDGE	1935374	0	0	0	0	0	80.00%	1548299	387075	0	80.00%	20.00%	0.00%
SFTY/TRF-OP/TSM	4925728	312922	0	0	0	0	90.00%	4433155	805495	0	84.62%	15.38%	0.00%
ENVIRONMENTAL	0	0	0	0	0	0	94.27%	0	0	0	0.00%	0.00%	0.00%
TOT MAINTENANCE	0	11370048	0	0	0	0		0	11370048	0	0.00%	100.00%	0.00%
TOTAL *****	111826773	12804354	0	0	0	0		104932592	19698535	0	84.19%	15.81%	0.00%
URBAN OTHER FREEWAY AND EXPRESSWAY													
RIGHT OF WAY	14103330	939326	0	0	35553	0	92.48%	13042760	1999896	35553	86.50%	13.26%	0.24%
PRELIM ENGIN	8372440	480794	0	0	40146	0	92.48%	7742833	1030401	40146	87.85%	11.69%	0.46%
NEW CONSTRUCT	11921385	599682	0	0	0	0	92.48%	11024897	1496170	0	88.05%	11.95%	0.00%
TOT RECONSTRUCT	4861551	2512203	0	0	227269	0	92.48%	4495962	2877792	227269	59.15%	37.86%	2.99%
TOTAL BRIDGE	5484	14857	0	0	0	0	80.00%	4387	15954	0	21.57%	78.43%	0.00%
SFTY/TRF-OP/TSM	4524727	3540035	0	0	14684	0	90.00%	4072254	3992508	14684	50.40%	49.42%	0.18%
ENVIRONMENTAL	0	68656	0	0	0	0	92.48%	0	68656	0	0.00%	100.00%	0.00%
TOT MAINTENANCE	0	5710202	0	0	336436	0		0	5710202	336436	0.00%	94.44%	5.56%
TOTAL *****	43788917	13785755	0	0	654088	0		40383093	17191579	654087.95	69.35%	29.52%	1.12%
URBAN OTHER PRINCIPAL ARTERIAL													
RIGHT OF WAY	27561322	1795957	208912	0	283498	103359	92.48%	25488711	4077480	386847	85.10%	13.61%	1.29%
PRELIM ENGIN	7171863	857416	21959	0	391433	66594	92.48%	6632539	1418699	458027	77.94%	16.67%	5.38%
NEW CONSTRUCT	27298114	5512704	364427	0	0	0	92.48%	25245296	7865949	0	76.23%	23.77%	0.00%
TOT RECONSTRUCT	25490471	25867481	5181198	0	2254603	378572	92.48%	23573588	32965562	2633175	39.84%	55.71%	4.45%
TOTAL BRIDGE	3248974	27535	5245	0	0	0	80.00%	2599179	682575	0	79.20%	20.80%	0.00%
SFTY/TRF-OP/TSM	2862783	5642636	1445724	0	151912	4748	90.00%	2576433	7374630	156660	25.49%	72.96%	1.55%
ENVIRONMENTAL	1009073	213153	26220	0	0	0	92.48%	933191	315255	0	74.75%	25.25%	0.00%
TOT MAINTENANCE	0	39226955	0	0	4032428	0		0	39226955	4032428	0.00%	90.58%	9.32%
TOTAL *****	94642520	79143837	7193685	0	7113885	553263		87048935	93931106	7667128.3	46.14%	49.79%	4.06%

Source: JHK generated from FHWA 534 data

TABLE C-5. NORTH CAROLINA DATA (CONTINUED)

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985) — SCENARIO 0 EXISTING CONDITIONS

STATE OF NORTH CAROLINA DOLLARS	FEDERAL/STATE (141) FED AID PROJECT	FEDERAL/STATE (141) NON FED AID PROJ	FEDERAL/STATE (141) NON FEDERAL AID SYSTEM	FEDERAL/LOCAL (142) FED AID PROJECT	FEDERAL/LOCAL (142) NON FED AID PROJ	FEDERAL/LOCAL (142) NON FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
URBAN MINOR ARTERIAL													
RIGHT OF WAY	8925338	352156	451210	0	311467	324164	92.48%	8254153	1474551	635631	79.64%	14.23%	6.13%
PRELIM ENGIN	2677692	373947	436096	0	519242	540407	92.48%	2476330	1011315	1059649	54.46%	22.24%	23.30%
NEW CONSTRUCT	7691659	331365	344092	0	0	0	92.48%	7113246	1254670	0	85.01%	14.99%	0.00%
TOT RECONSTRUCT	10978745	10920833	11366581	0	3161300	3290166	92.48%	10153143	23113016	6451466	25.56%	58.19%	16.24%
TOTAL BRIDGE	9288390	339941	353903	0	0	0	80.00%	7430712	2551522	0	74.44%	25.56%	0.00%
SFTY/TRF-OP/TSM	7242264	989375	1029465	0	80886	84185	90.00%	6518038	2743066	165071	69.15%	29.10%	1.75%
ENVIRONMENTAL	0	6565	6832	0	0	0	92.48%	0	13397	0	0.00%	100.00%	0.00%
TOT MAINTENANCE	0	42151093	0	0	10999460	0		0	42151093	10999460	0.00%	79.31%	20.69%
TOTAL *****	46804088	55465275	13988089	0	15072354	4238923		41945621	74312631	19311277	30.94%	54.02%	14.24%
URBAN COLLECTOR													
RIGHT OF WAY	156676	19954	158558	0	96590	507076	92.48%	144894	190294	603666	15.43%	20.27%	64.30%
PRELIM ENGIN	584089	2724	14301	0	190481	999976	92.48%	540166	60948	1190457	30.15%	3.40%	66.45%
NEW CONSTRUCT	367482	80963	426539	0	0	0	92.48%	339847	535137	0	38.84%	61.16%	0.00%
TOT RECONSTRUCT	93375	754472	3961079	0	1184655	6219126	92.48%	86353	4722573	7403781	0.71%	38.67%	60.62%
TOTAL BRIDGE	2573241	13665	71735	0	0	0	80.00%	2058593	600048	0	77.43%	22.57%	0.00%
SFTY/TRF-OP/TSM	984992	20878	109601	0	16334	85748	90.00%	914493	220978	102882	71.60%	19.43%	8.97%
ENVIRONMENTAL	0	20565	107964	0	0	0	92.48%	0	128529	0	0.00%	100.00%	0.00%
TOT MAINTENANCE	0	9832229	0	0	11178412	1818459		0	9832229	12996871	0.00%	43.07%	56.93%
TOTAL *****	4679855	10745450	4849777	0	12666472	9630385		3984346	16290736	22296857	9.36%	38.27%	52.37%
URBAN LOCAL													
CAPITAL OUTLAY	0	0	0	0	0	152019000	92.48%	0	0	152019000	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	0	0	0	230284000		0	0	230284000	0.00%	0.00%	100.00%
TOTAL *****	0	0	0	0	0	382303000		0	0	382303000	0.00%	0.00%	100.00%
URBAN TOTAL	301742153	171944671	26032351	0	35506778	396725571		278294588	221424587	432232350	29.86%	23.76%	46.38%
GRAND TOTAL	1144395188	773938161	122923067	0	36163195	396903391		1055784936	985471400	433866586	42.66%	39.82%	17.53%

Source: JHK generated from FHWA 534 data

TABLE C-6. PENNSYLVANIA DATA

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985)

FEDERAL/STATE (141) — FEDERAL/LOCAL (142) — SCENARIO 0 EXISTING CONDITIONS

STATE OF PENNSYLVANIA DOLLARS	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
RURAL INTERSTATE													
RIGHT OF WAY	35640393	1875645	0	0	0	0	94.27%	33605740	3910297	0	89.56%	10.44%	0.00%
PRELIM ENGIN	35301818	2816379	0	0	0	0	94.27%	33279024	4839173	0	87.30%	12.70%	0.00%
NEW CONSTRUCT	425038532	7619847	0	0	0	0	94.27%	400676283	31974096	0	92.61%	7.39%	0.00%
TOT RECONSTRUCT	329598609	85484462	0	0	0	0	94.27%	310712609	104370462	0	74.86%	25.14%	0.00%
TOTAL BRIDGE	224484309	36221181	0	0	0	0	80.00%	179587448	81118043	0	68.89%	31.11%	0.00%
SFTY/TRF-OP/TSM	16786864	462022	0	0	0	0	90.00%	15108178	2140708	0	87.59%	12.41%	0.00%
ENVIRONMENTAL	5299903	48463	0	0	0	0	94.27%	4996218	352148	0	93.42%	6.58%	0.00%
TOT MAINTENANCE	0	48098812	0	0	0	0		0	48098812	0	0.00%	100.00%	0.00%
TOTAL *****	1072150428	182626811	0	0	0	0		977965499	276811740	0	77.94%	22.06%	0.00%
RURAL OTHER PRINCIPAL ARTERIAL													
RIGHT OF WAY	20529835	1080167	0	0	0	0	92.48%	18985991	2624011	0	87.86%	12.14%	0.00%
PRELIM ENGIN	39989275	3190331	0	0	0	0	92.48%	36982082	6197525	0	85.65%	14.35%	0.00%
NEW CONSTRUCT	141991652	2545709	0	0	0	0	92.48%	131313680	13223482	0	90.85%	9.15%	0.00%
TOT RECONSTRUCT	110113820	28557460	0	0	0	0	94.27%	103804298	34866981	0	74.86%	25.14%	0.00%
TOTAL BRIDGE	74994959	12188864	0	0	0	0	80.00%	59995967	27099856	0	68.89%	31.11%	0.00%
SFTY/TRF-OP/TSM	5608190	154347	0	0	0	0	90.00%	5047371	715167	0	87.59%	12.41%	0.00%
ENVIRONMENTAL	1770643	16193	0	0	0	0	92.48%	1637490	149346	0	91.64%	8.36%	0.00%
TOT MAINTENANCE	0	382408580	0	0	0	0		0	382408580	0	0.00%	100.00%	0.00%
TOTAL *****	394998374	438053652	0	0	0	0		357767079	467284946	0	43.36%	56.64%	0.00%
RURAL MINOR ARTERIAL													
RIGHT OF WAY	7024330	369658	0	0	0	0	92.48%	6496180	897808	0	87.86%	12.14%	0.00%
PRELIM ENGIN	21795424	1738865	0	0	0	0	92.48%	20156400	3377881	0	85.65%	14.35%	0.00%
NEW CONSTRUCT	34990787	627182	0	0	0	0	92.48%	32359480	3258489	0	90.85%	9.15%	0.00%
TOT RECONSTRUCT	27130641	7038021	0	0	0	0	94.27%	25576055	8592607	0	74.85%	25.15%	0.00%
TOTAL BRIDGE	18480134	2981595	0	0	0	0	80.00%	14784107	6677622	0	68.89%	31.11%	0.00%
SFTY/TRF-OP/TSM	1381842	38038	0	0	0	0	90.00%	1243658	176222	0	87.59%	12.41%	0.00%
ENVIRONMENTAL	436237	3988	0	0	0	0	92.48%	403432	36793	0	91.64%	8.36%	0.00%
TOT MAINTENANCE	0	507245947	0	0	0	0		0	507245947	0	0.00%	100.00%	0.00%
TOTAL *****	111239394	520043293	0	0	0	0		101019240	530263447	0	16.00%	84.00%	0.00%
RURAL MAJOR COLLECTOR													
RIGHT OF WAY	80332763	4225841	0	0	0	0	92.48%	74291740	10267865	0	87.86%	12.14%	0.00%
PRELIM ENGIN	73289523	5847022	0	0	0	0	92.48%	67778151	11358394	0	85.65%	14.35%	0.00%
NEW CONSTRUCT	218589882	3918707	0	0	0	0	92.48%	202151183	20356606	0	90.85%	9.15%	0.00%
TOT RECONSTRUCT	169586245	43964429	0	0	0	0	94.27%	159793538	53677137	0	74.85%	25.14%	0.00%
TOTAL BRIDGE	115449583	18627925	0	0	0	0	80.00%	92359666	41717842	0	68.89%	31.11%	0.00%
SFTY/TRF-OP/TSM	8633280	237616	0	0	0	0	90.00%	7769880	1100936	0	87.59%	12.41%	0.00%
ENVIRONMENTAL	2725624	24922	0	0	0	0	92.48%	2520657	229889	0	91.64%	8.36%	0.00%
TOT MAINTENANCE	0	740939864	0	0	0	0		0	740939864	0	0.00%	100.00%	0.00%
TOTAL *****	668526021	817787327	0	0	0	0		606664815	879648533	0	40.82%	59.18%	0.00%

Source: JHK generated from FHWA 534 data

TABLE C-6. PENNSYLVANIA DATA (CONTINUED)

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985) — FEDERAL/STATE (141) — FEDERAL/LOCAL (142) — SCENARIO 0 EXISTING CONDITIONS

STATE OF PENNSYLVANIA

DOLLARS	FEDERAL AID SYSTEM: FED AID PROJECT	FEDERAL AID SYSTEM: NON FED AID PROJ	NON FEDERAL AID SYSTEM	FEDERAL AID SYSTEM: FED AID PROJECT	FEDERAL AID SYSTEM: NON FED AID PROJ	NON FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
RURAL MINOR COLLECTOR													
RIGHT OF WAY	9654561	507846	0	901113	3492179	0	92.48%	9761087	1233869	3559942	67.07%	8.48%	24.46%
PRELIM ENGIN	22213726	1772104	0	6012824	20346920	0	92.48%	28103913	3442576	20799884	51.85%	6.84%	41.31%
NEW CONSTRUCT	38352436	688325	0	0	0	0	92.48%	35468333	3572428	0	90.85%	9.15%	0.00%
TOT RECONSTRUCT	29763570	7709341	0	71303522	293862661	0	94.27%	95275947	9414794	297140353	23.71%	2.34%	73.95%
TOTAL BRIDGE	20259959	3270385	0	11818285	15997781	0	80.00%	25662603	7322378	16361438	49.98%	14.26%	35.76%
SFTY/TRF-OP/TSM	1515618	41685	0	4777422	6217273	0	90.00%	5663736	193247	6695015	45.12%	1.54%	53.34%
ENVIRONMENTAL	478709	4302	0	1537765	3861313	0	92.48%	1864035	40381	3976953	31.78%	0.69%	67.61%
TOT MAINTENANCE	0	42870137	0	0	928710634	0		0	42870137	928710634	0.00%	4.41%	95.59%
TOTAL *****	122238588	56864205	0	96358931	1271688760	0		199801255	68089810	1279251419	12.91%	4.40%	82.68%
RURAL LOCAL													
CAPITAL OUTLAY	0	0	0	0	0	61091000	92.48%	0	0	61091000	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	0	0	0	160228000		0	0	160228000	0.00%	0.00%	100.00%
TOTAL *****	0	0	0	0	0	221319000		0	0	221319000	0.00%	0.00%	100.00%
RURAL TOTAL	2369152805	2007375287	0	96358931	1271688760	221319000		2243217884	2222098477	1500570419	37.60%	37.25%	25.15%
URBAN INTERSTATE													
RIGHT OF WAY	448002	12434	0	0	0	0	94.27%	422331	38105	0	91.72%	8.28%	0.00%
PRELIM ENGIN	492266	36502	0	0	0	0	94.27%	464060	64709	0	87.76%	12.24%	0.00%
NEW CONSTRUCT	123788425	2549950	0	0	0	0	94.27%	116687807	9642568	0	92.37%	7.63%	0.00%
TOT RECONSTRUCT	96384482	20924284	0	0	0	0	94.27%	90861652	26447115	0	77.46%	22.54%	0.00%
TOTAL BRIDGE	57105738	10832152	0	0	0	0	80.00%	45684590	22253299	0	67.24%	32.76%	0.00%
SFTY/TRF-OP/TSM	4184555	136659	0	0	0	0	90.00%	3694180	547114	0	87.10%	12.90%	0.00%
ENVIRONMENTAL	1809148	14061	0	0	0	0	94.27%	1705484	118525	0	93.50%	6.50%	0.00%
TOT MAINTENANCE	0	8863988	0	0	0	0		0	8863988	0	0.00%	100.00%	0.00%
TOTAL *****	284124617	43378831	0	0	0	0		259520023	67975424	0	79.24%	20.76%	0.00%
URBAN OTHER FREEWAY AND EXPRESSWAY													
RIGHT OF WAY	14185785	394233	0	0	0	0	92.48%	13119014	1461004	0	89.98%	10.02%	0.00%
PRELIM ENGIN	5085194	377857	0	0	0	0	92.48%	4702787	759464	0	86.10%	13.90%	0.00%
NEW CONSTRUCT	90313053	1819005	0	0	0	0	92.48%	81671911	8460227	0	90.61%	9.39%	0.00%
TOT RECONSTRUCT	68759239	14929714	0	0	0	0	92.48%	63588545	20100409	0	75.98%	24.02%	0.00%
TOTAL BRIDGE	40722169	7727712	0	0	0	0	80.00%	32577735	15872146	0	67.24%	32.76%	0.00%
SFTY/TRF-OP/TSM	2920050	97503	0	0	0	0	90.00%	2835245	390308	0	87.10%	12.90%	0.00%
ENVIRONMENTAL	1308997	10599	0	0	0	0	92.48%	1210560	109036	0	91.74%	8.26%	0.00%
TOT MAINTENANCE	0	111751772	0	0	0	0		0	111751772	0	0.00%	100.00%	0.00%
TOTAL *****	221302487	137187676	0	0	0	0		199505797	158904365	0	55.66%	44.34%	0.00%
URBAN OTHER PRINCIPAL ARTERIAL													
RIGHT OF WAY	21707610	603245	0	0	0	0	92.48%	20075197	2235657	0	89.98%	10.02%	0.00%
PRELIM ENGIN	32355817	2399114	0	0	0	0	92.48%	29922660	4832272	0	86.10%	13.90%	0.00%
NEW CONSTRUCT	86356391	1776789	0	0	0	0	92.48%	79862390	8272790	0	90.61%	9.39%	0.00%
TOT RECONSTRUCT	67236066	14598896	0	0	0	0	92.48%	62179914	19655049	0	75.98%	24.02%	0.00%
TOTAL BRIDGE	39820907	7556520	0	0	0	0	80.00%	31856006	15520522	0	67.24%	32.76%	0.00%
SFTY/TRF-OP/TSM	2863188	95343	0	0	0	0	90.00%	2576869	381662	0	87.10%	12.90%	0.00%
ENVIRONMENTAL	1280003	10365	0	0	0	0	92.48%	1183747	106621	0	91.74%	8.26%	0.00%
TOT MAINTENANCE	0	106646413	0	0	0	0		0	106646413	0	0.00%	100.00%	0.00%
TOTAL *****	251619002	133688686	0	0	0	0		227656783	157650905	0	59.08%	40.92%	0.00%

Source: JHK generated from FHWA 534 data

TABLE C-6. PENNSYLVANIA DATA (CONTINUED)

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985) — FEDERAL/STATE (141) — FEDERAL/LOCAL (142) — SCENARIO 0 EXISTING CONDITIONS

STATE OF PENNSYLVANIA DOLLARS	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
URBAN MINOR ARTERIAL													
RIGHT OF WAY	2327376	64677	0	0	0	0	92.48%	2152357	239696	0	89.38%	10.02%	0.00%
PRELIM ENGIN	11084672	822198	0	0	0	0	92.48%	10254083	1656066	0	86.10%	13.90%	0.00%
NEW CONSTRUCT	4910430	101358	0	0	0	0	92.48%	4541165	470623	0	90.61%	9.39%	0.00%
TOT RECONSTRUCT	3038789	829192	0	0	0	0	92.48%	3542714	1117268	0	76.02%	23.98%	0.00%
TOTAL BRIDGE	2266651	430320	0	0	0	0	80.00%	1813321	883650	0	67.26%	32.76%	0.00%
SFTY/TRF-OP/TSM	163208	5418	0	0	0	0	90.00%	146887	21739	0	87.11%	12.89%	0.00%
ENVIRONMENTAL	72907	592	0	0	0	0	92.48%	67425	6075	0	91.73%	8.27%	0.00%
TOT MAINTENANCE	0	344650054	0	0	0	0		0	344650054	0	0.00%	100.00%	0.00%
TOTAL *****	24660832	346903810	0	0	0	0		22518672	349045170	0	6.06%	93.94%	0.00%
URBAN COLLECTOR													
RIGHT OF WAY	4037532	64401	7329403	0	0	488142	92.48%	3733910	7697427	488142	31.33%	64.58%	4.10%
PRELIM ENGIN	4254997	312937	9639257	0	0	2928846	92.48%	3935022	10272171	2928846	22.96%	59.94%	17.09%
NEW CONSTRUCT	6402675	12556	11990875	0	0	0	92.48%	5921194	12484912	0	32.17%	67.83%	0.00%
TOT RECONSTRUCT	2375405	1049492	13699806	0	0	40739101	92.48%	2196775	14927927	40739101	3.00%	25.00%	70.41%
TOTAL BRIDGE	1735251	331228	7845186	0	0	2928848	80.00%	1388201	8523464	2928848	10.81%	66.38%	22.81%
SFTY/TRF-OP/TSM	103539	2966	512783	0	0	1129162	90.00%	93185	526183	1129162	5.33%	30.09%	64.58%
ENVIRONMENTAL	12662	60	257762	0	0	599894	92.48%	11710	258773	599894	1.35%	29.73%	68.92%
TOT MAINTENANCE	0	811888	305889	0	0	103189536		0	1117777	103189536	0.00%	1.07%	98.93%
TOTAL *****	18922063	2585528	51580960	0	0	152003530		17279996	55808554	152003529.	7.68%	24.79%	67.53%
URBAN LOCAL													
CAPITAL OUTLAY	0	0	0	0	0	52439000	92.48%	0	0	52439000	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	0	0	0	140746000		0	0	140746000	0.00%	0.00%	100.00%
TOTAL *****	0	0	0	0	0	193185000		0	0	193185000	0.00%	0.00%	100.00%
URBAN TOTAL	800628280.	663656530	51580960	0	0	345188529		726481272	789384490	345188530	39.04%	42.42%	18.55%
GRAND TOTAL	3169781086	2671031817	51580960	96350931	1271688760	566507530		2969699160	3011482975	1045758949	37.94%	38.48%	23.58%

Source: JHK generated from FHWA 534 data

TABLE C-7. WASHINGTON DATA

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985) — FEDERAL/STATE (141) — FEDERAL/LOCAL (142) — SCENARIO 0 EXISTING CONDITIONS

STATE OF WASHINGTON DOLLARS	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
RURAL INTERSTATE													
RIGHT OF WAY	77365691	5330270	0	0	0	0	94.27%	72932637	9763324	0	88.15%	11.81%	0.00%
PRELIM ENGIN	136306747	312229	0	0	0	0	94.27%	128496370	8122606	0	94.05%	5.95%	0.00%
NEW CONSTRUCT	120339731	0	0	0	0	0	94.27%	113444264	6895467	0	94.27%	5.73%	0.00%
TOT RECONSTRUCT	268931394	1244394	53800	0	0	0	94.27%	253521625	16707163	0	93.82%	6.18%	0.00%
TOTAL BRIDGE	12532656	3350412	0	0	0	0	80.30%	10026125	5856343	0	63.12%	36.88%	0.00%
SFTY/TRF-OP/TSM	59776698	378172	0	0	0	0	90.00%	53799028	6355842	0	89.43%	10.57%	0.00%
ENVIRONMENTAL	5729608	1796	0	0	0	0	94.27%	5401301	330103	0	94.24%	5.76%	0.00%
TOT MAINTENANCE	0	49565107	0	0	0	0		0	49565107	0	0.00%	100.00%	0.00%
TOTAL *****	680982525	60182380	53800	0	0	0		637621351	103596554	0	86.02%	13.98%	0.00%
RURAL OTHER PRINCIPAL ARTERIAL													
RIGHT OF WAY	306277	1954841	0	0	0	0	92.48%	283245	1977873	0	12.53%	87.47%	0.00%
PRELIM ENGIN	8497775	7851542	0	0	0	0	92.48%	7858742	8490575	0	48.07%	51.93%	0.00%
NEW CONSTRUCT	72162	17884133	0	0	0	0	92.48%	66735	17889560	0	0.39%	99.61%	0.00%
TOT RECONSTRUCT	18102589	8798685	0	0	0	0	94.27%	9523711	9377563	0	50.39%	49.61%	0.00%
TOTAL BRIDGE	607950	0	0	0	0	0	80.00%	486360	121590	0	80.00%	20.00%	0.00%
SFTY/TRF-OP/TSM	5148660	3734619	0	0	0	0	90.00%	4633734	4249485	0	52.16%	47.84%	0.00%
ENVIRONMENTAL	545254	391706	0	0	0	0	92.48%	504251	432709	0	53.82%	46.18%	0.00%
TOT MAINTENANCE	0	8235704	0	0	0	0		0	8235704	0	0.00%	100.00%	0.00%
TOTAL *****	25280667	48051238	0	0	0	0		23356838	49975059	0	31.85%	68.15%	0.00%
RURAL MINOR ARTERIAL													
RIGHT OF WAY	3223104	10281941	0	3148499	3293698	1390	92.48%	5892459	10524318	3531855	29.54%	52.76%	17.70%
PRELIM ENGIN	14412137	14918497	112032	20514360	11217226	38470	92.48%	32300025	16114322	12790376	52.77%	26.33%	20.96%
NEW CONSTRUCT	124132	38425794	0	473161	0	0	92.48%	552377	38435129	35582	1.42%	98.49%	0.09%
TOT RECONSTRUCT	35708885	15405669	0	26990983	46457644	219918	94.27%	59099624	17451330	48224145	47.36%	13.99%	38.65%
TOTAL BRIDGE	2222416	441166	0	106860422	5968323	4879	80.00%	86626271	885649	27185286	75.53%	0.77%	23.70%
SFTY/TRF-OP/TSM	7603264	4739778	0	10286524	7168008	18435	90.00%	16100809	5580104	8215695	54.00%	18.45%	27.55%
ENVIRONMENTAL	1345563	1465133	0	1834229	989663	0	92.48%	2200832	1566319	987437	46.29%	32.94%	20.77%
TOT MAINTENANCE	0	18903436	0	0	107678403	0		0	18903436	107678403	0.00%	14.93%	85.07%
TOTAL *****	64631591	104581414	112032	168508179	182693944	275092		202772396	109380687	208648259	38.93%	21.00%	40.06%
RURAL MAJOR COLLECTOR													
RIGHT OF WAY	1339052	968471	2220	2641706	4264031	22971	92.48%	3681405	1071388	4485658	39.85%	11.60%	48.55%
PRELIM ENGIN	8383169	5388979	14249	9586847	12870328	47194	92.48%	16544623	6033637	13632437	45.69%	16.66%	37.65%
NEW CONSTRUCT	108806	7401474	0	220787	0	0	92.48%	304068	7409596	16603	3.93%	95.85%	0.21%
TOT RECONSTRUCT	10368615	6672211	68876	28814229	42653540	169272	94.27%	36937867	7335289	44473867	41.62%	8.27%	50.11%
TOTAL BRIDGE	4734573	27860	0	6138074	9935901	71376	80.00%	8698118	974775	11234892	41.60%	4.66%	53.74%
SFTY/TRF-OP/TSM	5525920	1762789	1109	10926314	7630682	47984	90.00%	14861064	2322496	8771297	57.26%	8.95%	33.79%
ENVIRONMENTAL	186298	155959	0	498035	1117536	917	92.48%	625472	169969	1155304	32.06%	8.71%	59.22%
TOT MAINTENANCE	0	4192915	0	0	127418682	0		0	4192915	127418682	0.00%	3.19%	96.81%
TOTAL *****	30705624	26570658	86454	58737992	205890701	359714		81652417	29589984	211188741	25.33%	9.15%	65.52%

Source: JHK generated from FHWA 534 data

TABLE C-7. WASHINGTON DATA (CONTINUED)

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985) — SCENARIO 0 EXISTING CONDITIONS

STATE OF WASHINGTON DOLLARS	FEDERAL AID SYSTEM FEDERAL/STATE (141) FED AID PROJECT	FEDERAL AID SYSTEM FEDERAL/STATE (141) NON FED AID PROJ	NON FEDERAL AID SYSTEM	FEDERAL AID SYSTEM FEDERAL/LOCAL (142) FED AID PROJECT	FEDERAL AID SYSTEM FEDERAL/LOCAL (142) NON FED AID PROJ	NON FEDERAL AID SYSTEM	PERCENT FEDERAL DOLLARS	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
RURAL MINOR COLLECTOR													
RIGHT OF WAY	444627	2504735	7214	2730496	3236552	51002	92.48%	2936354	2625385	3492887	32.43%	28.99%	38.58%
PRELIM ENGIN	3403347	1022717	115376	6066779	10797122	134707	92.48%	6757972	1394025	11388051	40.06%	6.47%	52.87%
NEW CONSTRUCT	84019	0	0	291501	0	0	92.48%	347281	6318	21921	92.48%	1.68%	5.84%
TOT RECONSTRUCT	3903663	5745851	17857	20873941	34543948	672895	94.27%	23357848	5987358	36412920	35.52%	9.11%	55.37%
TOTAL BRIDGE	2759886	4640	0	8997502	7618792	135562	80.00%	9405911	556617	9552855	48.19%	2.85%	48.95%
SFTY/TRF-OP/TSM	919596	524863	3608	7924748	6314647	123047	90.00%	7959909	628431	7830169	48.50%	3.78%	47.71%
ENVIRONMENTAL	53467	43130	0	71110	848128	0	92.48%	115209	47151	845475	11.43%	4.68%	83.89%
TOT MAINTENANCE	0	824547	0	0	99333402	0		0	824547	99333402	0.00%	0.82%	99.18%
TOTAL *****	11568685	10750483	144055	46956077	163284591	1117214		52080484	12961861	160870680	22.62%	5.16%	72.23%
RURAL LOCAL													
CAPITAL OUTLAY	0	0	0	0	0	160670000	92.48%	0	0	160670000	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	0	0	0	69814000		0	0	69814000	0.00%	0.00%	100.00%
TOTAL *****	0	0	0	0	0	230484000		0	0	230484000	0.00%	0.00%	100.00%
RURAL TOTAL	813168922	250136165	395541	274202248	551868335	232236019		998283486	304524065	819199680	47.04%	14.35%	38.60%
URBAN INTERSTATE													
RIGHT OF WAY	11329496	31661	0	0	0	0	94.27%	10680316	680841	0	94.01%	5.99%	0.00%
PRELIM ENGIN	32935683	217370	0	0	0	0	94.27%	31048468	2104585	0	93.65%	6.35%	0.00%
NEW CONSTRUCT	107090593	0	0	0	0	0	94.27%	101716004	6182589	0	94.27%	5.73%	0.00%
TOT RECONSTRUCT	56347679	341	0	0	0	0	94.27%	53118957	3229063	0	94.27%	5.73%	0.00%
TOTAL BRIDGE	3195972	0	0	0	0	0	80.00%	2556778	639194	0	80.00%	20.00%	0.00%
SFTY/TRF-OP/TSM	17979694	472717	0	0	0	0	90.00%	16181725	2270686	0	87.69%	12.31%	0.00%
ENVIRONMENTAL	2285142	4964	0	0	0	0	94.27%	2154283	135903	0	94.07%	5.93%	0.00%
TOT MAINTENANCE	0	69789731	0	0	0	0		0	69789731	0	0.00%	100.00%	0.00%
TOTAL *****	231972259	70516784	0	0	0	0		217456450	85032593	0	71.89%	28.11%	0.00%
URBAN OTHER FREEWAY AND EXPRESSWAY													
RIGHT OF WAY	4068532	3968376	0	0	0	0	92.48%	3762578	4274330	0	46.82%	53.18%	0.00%
PRELIM ENGIN	35840522	14818991	0	0	0	0	92.48%	33145315	17514198	0	65.43%	34.57%	0.00%
NEW CONSTRUCT	8735815	9161531	0	0	0	0	92.48%	8078882	9818464	0	45.14%	54.86%	0.00%
TOT RECONSTRUCT	79188963	29777602	0	0	0	0	92.48%	73232103	35732462	0	67.21%	32.79%	0.00%
TOTAL BRIDGE	94197802	2747821	0	0	0	0	80.00%	75357602	21587221	0	77.73%	22.27%	0.00%
SFTY/TRF-OP/TSM	16281809	2878130	0	0	0	0	90.00%	14653628	4506311	0	76.48%	23.52%	0.00%
ENVIRONMENTAL	7534277	1343633	0	0	0	0	92.48%	6967699	1910211	0	78.48%	21.52%	0.00%
TOT MAINTENANCE	0	52623675	0	0	0	0		0	52623675	0	0.00%	100.00%	0.00%
TOTAL *****	245844920	117319759	0	0	0	0		215197807	147966872	0	59.26%	40.74%	0.00%
URBAN OTHER PRINCIPAL ARTERIAL													
RIGHT OF WAY	5742368	1296475	0	0	0	0	92.48%	5310542	1728301	0	75.45%	24.55%	0.00%
PRELIM ENGIN	39180970	5114813	0	0	0	0	92.48%	36241959	8061824	0	81.80%	18.20%	0.00%
NEW CONSTRUCT	762406	1979267	0	0	0	0	92.48%	705147	2036686	0	25.72%	74.28%	0.00%
TOT RECONSTRUCT	90060789	4012642	0	0	0	0	92.48%	83288218	10785213	0	88.54%	11.46%	0.00%
TOTAL BRIDGE	17094523	3899366	0	0	0	0	80.00%	14315618	7478271	0	65.69%	34.31%	0.00%
SFTY/TRF-OP/TSM	16641179	656986	0	0	0	0	90.00%	14977061	2321104	0	86.58%	13.42%	0.00%
ENVIRONMENTAL	2561010	352028	0	0	0	0	92.48%	2368422	544616	0	81.30%	18.70%	0.00%
TOT MAINTENANCE	0	59581579	0	0	0	0		0	59581579	0	0.00%	100.00%	0.00%
TOTAL *****	172951325	76892356	0	0	0	0		157266968	92536713	0	62.95%	37.05%	0.00%

Source: JHK generated from FHWA 534 data

TABLE C-7. WASHINGTON DATA (CONTINUED)

SUMMARY OF HIGHWAY EXPENDITURES — FIVE YEAR TOTALS (1981 - 1985) — FEDERAL/STATE (141) — FEDERAL/LOCAL (142) — SCENARIO 0 EXISTING CONDITIONS

STATE OF WASHINGTON DOLLARS	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	FEDERAL AID SYSTEM FED AID PROJECT	FEDERAL AID SYSTEM NON FED AID PROJ	NON FEDERAL AID SYSTEM	PERCENT FEDERAL	TOTAL FEDERAL DOLLARS	TOTAL STATE DOLLARS	TOTAL LOCAL DOLLARS	PERCENT FEDERAL	PERCENT STATE	PERCENT LOCAL
URBAN MINOR ARTERIAL													
RIGHT OF WAY	1569662	600467	0	2619495	1667967	6754	92.48%	3010644	713994	1871707	59.63%	11.15%	29.23%
PRELIM ENGIN	11852539	1561909	10820	7722108	5411302	24431	92.48%	18102633	2464040	6016436	68.10%	9.27%	22.63%
NEW CONSTRUCT	2832333	3636187	0	177692	0	0	92.48%	2783671	3849098	13362	41.88%	57.91%	0.20%
TOT RECONSTRUCT	33186815	290267	0	31711961	17314689	444761	92.48%	60010388	2785915	20144189	72.36%	3.36%	24.29%
TOTAL BRIDGE	10376826	0	0	16875528	2030753	23695	80.00%	21001883	2075365	5429553	74.39%	7.00%	18.53%
SFTY/TRF-OP/TSM	4760867	13437	0	4951743	3334475	48570	90.00%	8740549	490324	3878220	66.70%	3.74%	29.57%
ENVIRONMENTAL	426655	0	0	205017	543303	0	92.48%	584171	32084	558721	49.72%	2.73%	47.55%
TOT MAINTENANCE	0	23635483	0	0	151412101	0		0	23635483	151412101	0.00%	13.50%	86.50%
TOTAL *****	64953697	29737670	10820	64263545	181714591	548211		115057940	36046384	189324289.	33.95%	10.56%	55.48%
URBAN COLLECTOR													
RIGHT OF WAY	0	0	46062	0	0	3048990	92.48%	0	46062	3048990	0.00%	1.49%	98.51%
PRELIM ENGIN	425469	62735	368289	0	0	10014244	92.48%	393474	455019	10014244	3.62%	4.19%	92.19%
NEW CONSTRUCT	0	0	0	0	0	185423	92.48%	0	0	185423	0.00%	0.00%	100.00%
TOT RECONSTRUCT	6271	2024	363570	0	0	33884571	92.48%	5799	366066	33884571	0.02%	1.07%	98.91%
TOTAL BRIDGE	313	0	64020	0	0	8116967	80.00%	250	64083	8116967	0.00%	0.78%	99.21%
SFTY/TRF-OP/TSM	12400	12405	45470	0	0	5473950	90.00%	11160	59195	5473950	0.28%	1.07%	98.73%
ENVIRONMENTAL	0	0	0	0	0	454446	92.48%	0	0	454446	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	46782	0	0	0	112956938		0	46782	112956938	0.00%	0.04%	99.96%
TOTAL *****	444453	124026	879411	0	0	174135538		410684	1037206	174135538.	0.23%	0.59%	99.18%
URBAN LOCAL													
CAPITAL OUTLAY	0	0	0	0	0	81910000	92.48%	0	0	81910000	0.00%	0.00%	100.00%
TOT MAINTENANCE	0	0	0	0	0	180540000		0	0	180540000	0.00%	0.00%	100.00%
TOTAL *****	0	0	0	0	0	262450000		0	0	262450000	0.00%	0.00%	100.00%
URBAN TOTAL	716066654	294590595	890231	64263545	181714591	437133748		706129849	362619688	625909828	41.67%	21.40%	36.93%
GRAND TOTAL	1529235576	544726760	1285772	338465793	733582927	669369768		1704413335	667143753	1445109507	44.66%	17.48%	37.86%

Source: JHK generated from FHWA 534 data

APPENDIX D

REFERENCES

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