

NEEDS OF THE HIGHWAY SYSTEMS, 1955-84

LETTER

FROM

SECRETARY OF COMMERCE

TRANSMITTING

A REPORT ON THE COST OF CONSTRUCTION NEEDED TO MODERNIZE THE NATION'S HIGHWAYS, PREPARED BY THE COMMISSIONER OF PUBLIC ROADS IN COOPERATION WITH THE SEVERAL STATE HIGHWAY DEPARTMENTS, AND A STATEMENT ON HIGHWAY FINANCING, PURSUANT TO SECTION 13 OF THE FEDERAL-AID HIGHWAY ACT OF 1954, APPROVED
MAY 6, 1954



MARCH 28, 1955.—Referred to the Committee on Public Works and ordered to be printed with illustrations

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LETTER OF TRANSMITTAL

THE SECRETARY OF COMMERCE,
Washington 25, March 25, 1955.

HON. SAM RAYBURN,
*Speaker of the House,
House of Representatives,
Washington 25, D. C.*

MY DEAR MR. SPEAKER: I transmit herewith a report on the cost of construction needed to modernize the Nation's highways, prepared by the Commissioner of Public Roads in cooperation with the several State highway departments, and a statement on highway financing.

The report has been prepared pursuant to a direction of the Congress contained in section 13 of the Federal-Aid Highway Act of 1954, approved May 6, 1954, quoted as follows:

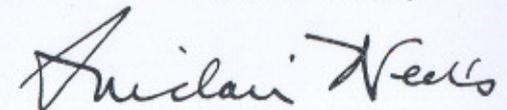
SEC. 13. The Secretary of Commerce is authorized and directed to make a comprehensive study of all phases of highway financing, including a study of the costs of completing the several systems of highways in the several States and of the progress and feasibility of toll roads with particular attention to the possible effects of such toll roads upon the Federal-aid highway programs, and coordination thereof, and to make a report of his findings, including recommendations with respect to Federal participation in toll roads, to be submitted to the Congress not later than February 1, 1955: *Provided*, That not to exceed \$100,000 from funds available for administrative expenses shall be expended for the purposes of this section.

A further report discussing toll roads and containing recommendations with respect to Federal participation in such roads is practically complete and will be submitted shortly.

The accompanying report shows in detail the very large expenditures required to make the Nation's highways adequate. It is impressive that only through greatly enlarged financial provision can urgent needs for highway transportation be met.

Sincerely yours,

SINCLAIR WEEKS,



Secretary of Commerce.

NEEDS OF THE HIGHWAY SYSTEMS, 1955-84

The cost of needed construction, designed to modernize the Nation's roads and streets over the next 10 years, will amount to \$101 billion, and an additional \$25 billion will be required for highway maintenance and administration.

These are the estimates obtained in a study undertaken in 1954 by the Bureau of Public Roads, with the cooperation of the State highway departments, in accordance with the request of Congress for

* * * a study of the costs of completing the several systems of highways in the several States * * *

INTERPRETATIONS

The intent of the request by the Congress is clear, but the interpretation of the specific wording warrants some discussion.

Continuing needs

It is not possible to "complete" a highway in the sense that it can by a single construction operation be made forever adequate. From the very day that highway facilities are opened to traffic, they begin the course of deterioration and obsolescence that eventually leads to necessary reconstruction or replacement.

Natural forces—heat, cold, and moisture—subject the roads to damaging erosion, freezing and thawing, contraction and expansion. The endlessly repetitive passage of vehicles, particularly those with heavy axle loads, pound away, flexing and fatiguing the surfaces.

The volume of traffic is ever increasing; there is continuous change in the characteristics of the vehicles—their sizes, weights, power, and speed capabilities; new traffic needs develop. Thus in time it becomes necessary to straighten alinements, reduce grades, provide more width, and add new roads.

Individually and in combination these forces operate to make the job of building, improving, and rebuilding highways a continuous process. In this sense, therefore, a highway system is never complete.

Basis of needs

The term "needs" likewise requires explanation. It is a word widely used in recent years to denote construction backlog. Amounts cited as "needs" sometimes refer to the cost of complete modernization as of a given moment; sometimes they cover a construction program stretching over a period of years.

Some estimates are based on the needs of current traffic; others take future traffic fully into account.

There are variations, too, in the specifications of design standards, and there are differences in their application—one study may permit no deviations, while another will accept large deviations or tolerances.

Advance decision as to financial feasibility of meeting needs has also been an influence in some needs studies. Such an adjustment, in the interest of producing a "realistic" estimate of needs, should be made *after* the estimate has been derived. It should not be made by arbitrary reduction of standards or other means beforehand.

STUDIES IN RECENT YEARS

To greater or lesser degree the foregoing factors have been involved in the estimates of needs developed both statewide and nationwide in recent years. It is important that this be clearly understood, lest erroneous conclusions be drawn when making general comparisons.

Provision of adequate highways has never been abreast of demand. Needs were mounting prior to World War II. During the war, curtailment of construction resulted in a further lag. Since 1946 traffic has increased with each succeeding year, but highway construction has not kept pace.

In needs studies made during the immediate postwar period (1946-50), the rapid increase in highway usage was viewed by many as a temporary phenomenon—a leveling-off was anticipated in the predictable future. Even so, estimates of needs showed construction requirements of great magnitude.

Since then, economic studies based on the wealth of data made available by the 1950 census have indicated that other elements of the Nation's economy were also enjoying vigorous growth patterns, and that they are likely to so continue. It has become evident that the continuing increase of highway travel is not an isolated trend.

The shortage of current revenues for highways existing since 1946, in the face of needs known to be large, has posed a dilemma to highway agencies. On the one hand there is the basically sound policy of putting as much money as possible into high-type improvements with long service lives—a policy that generates dissatisfaction when badly needed improvement of some roads is held in abeyance while a substantial portion of available funds is concentrated on other roads.

The alternative is an across-the-board "make-do" program, characterized by short-term, stopgap work done in lieu of needed major improvements. Such programs provide temporary relief rather than cures for the problem; they rarely reduce the ultimate need for large-scale improvement.

INITIATION OF STUDY

By 1954, when Congress requested an estimate of highway needs, a large body of fact was available to the States, and the technique for making such an estimate had advanced materially. The Bureau of Public Roads sought the cooperation of the 48 States, the District of Columbia, Hawaii, and Puerto Rico, and the basic estimates of needs and costs presented in this report represent the data furnished by them.

It is recognized that some tendency to understate needs still exists. Lack of full supporting evidence of need may cause the paring down of estimates to the point where they cannot be questioned; this is probably true in greater degree in the estimates for urban areas. Additionally, the true needs in many cities are exceedingly great in

relation to current prospects of meeting them, and there is a tendency toward understatement in the interest of producing an estimate that reflects financial feasibility rather than anticipated needs.

Relatively minor differences occurred among the States in the interpretation of and adherence to the concepts and guides established for this study. These account for a certain lack of uniformity in the reported information. Nevertheless, the totals are deemed wholly adequate as a representation of nationwide needs, forming a basis for setting the initial course of remedial action.

Systems studied

The States were asked to furnish estimates of needs for all roads and streets, segregated by systems as follows:

Federal-aid systems:

1. Interstate, rural
2. Interstate, urban
3. Other Federal-aid primary, rural
4. Other Federal-aid primary, urban
5. Federal-aid secondary, under State control
6. Federal-aid secondary, under local control

Non-Federal-aid systems:

7. Other State highways, rural
8. Other State highways, urban
9. Other rural roads
10. Other city streets

Existing and programmed toll roads were included in the systems deemed most logical from the standpoint of traffic service.

All costs were estimated at midyear 1954 prices. Construction cost estimates include an allowance for engineering and contingencies.

The estimates also include costs for Federal road systems (forest highway system, national park road system, national parkways, Indian reservation roads, and forest development roads). These have not been itemized individually. Many portions of these Federal systems are also in one or another of the above listed systems; those portions wholly Federal (no other governmental jurisdiction involved) are included with other rural roads and city streets.

The rural-urban classification used for systems 1-4 is that prescribed by Federal-aid legislation: Urban mileage is that in areas including and adjacent to municipalities or other urban places of 5,000 population or more. For systems 5 and 6, the mileage is almost wholly rural (outside the urban areas just described). It does include mileage without reference to municipal boundaries in the District of Columbia, Puerto Rico, and 7 States where population density exceeds 200 persons per square mile.

For the non-Federal-aid systems (7-10), the States followed their individual practices in classifying mileage as rural or urban.

It should be noted that some differences exist in mileages cited in this study and mileages previously reported in other publications by the Bureau of Public Roads. Some of these differences result from differences in rural-urban and system segregations; some, particularly in the figures for local roads and streets, are accounted for by the fact that the States have made new estimates. All of the mileages cited in this report are those reported by the States in connection with the needs study.

Periods covered

The estimates presented in this report cover two periods:

First 10 years, 1955-64.—Estimates were prepared to provide that each road system will be improved, by the end of 1964, to a condition adequate for its predicted traffic in 1964 (1974 in the case of the interstate system).

Next 20 years, 1965-84.—On the assumption that adequacy will be reached in 1964, estimates were prepared to provide for sustaining adequacy thereafter. The States supplied these estimates for the 20 years, 1965-84.

SYSTEM IMPROVEMENT

One of the principal objectives of the needs study was to develop costs that are realistic estimates of needs, unaffected by preconceptions of ability to finance or execute a program. The proposed development of the various road systems is described briefly in the following paragraphs.

Interstate system

1955-64.—During the first 10 years the concept of development for the interstate system contemplates improvement of the entire system so that by the end of the period every road section will be structurally adequate, will have lane width sufficient to carry traffic predicted for 1974, and will otherwise be adequate for 30 to 40 years from the date of its construction.

1965-84.—The system is to be kept in continuing sound structural and functional condition after 1964. After 1974 additional lanes will be built as traffic needs warrant.

Other Federal-aid primary

1955-64.—The concept of development for the Federal-aid primary system (exclusive of the interstate system) for the first 10 years is to provide improvements so that the system will, by the end of 1964, be adequate for traffic of that year. Any road section improved during this period shall have a generally high-type surface, a sufficient number of lanes to take care of traffic for 10 years, and adequacy in other geometric respects for 30 years from the date of its construction.

1965-84.—As road sections become inadequate structurally or functionally, after 1964, they shall be rebuilt in accordance with a continuation of the concept for the first 10 years.

All other systems

1955-64.—For the more important and heavily traveled roads and streets of all other systems, the 1955-64 improvement contemplated is similar to that for the "other Federal-aid primary," except that shorter service lives and lower type surfaces may be used. For the less important and lightly traveled roads and streets, the need is generally one of providing locally acceptable traffic service.

1965-84.—After 1964, all roads and streets shall be kept adequate in accordance with continuation of the concept for the first 10 years.

Design standards

When a road or street is to be improved, the new construction should conform to certain requirements for width, alignment, grade, and so on. These requirements are called geometric design standards.

In preparing the cost estimates of needed improvements for this study the highest design standards were, of course, used for the interstate system. Progressively lower standards were used for each road system of lesser importance. In general, the design standards used in making the cost estimates are in accord with those adopted by the States.

For the interstate system the concept is one of improvement so that the entire system will, by 1964, be structurally and functionally adequate, with all the essential features of a well-designed road capable of handling 1974 traffic. This implies substantial rebuilding during the first 10 years.

For other principal road and street systems, determination of sections needing rebuilding by 1964 was based on the acceptability of tolerable conditions—under which roads and streets can be considered acceptable even though they may not measure up to the design standard. Such roads and streets would be kept in service until they were no longer judged as being adequate even by the measure of tolerable conditions.

For example, an adequate design for an anticipated traffic volume of 3,000 vehicles per day in 1964 might call for a 24-foot width of surface, 10-foot shoulders, a maximum grade of 5 percent, and a maximum curvature of 5 degrees; but the existing road would be considered tolerable with respect to these features if it had a 20-foot surfaced width, 6-foot shoulders, a maximum grade of 6 percent, and a maximum curvature of 9 degrees.

Similar criteria with respect to other features were employed as an aid in determining the extent of needed work to overcome deficiencies. The procedure is in general conformity with the practices employed by the States in recent years in estimating highway needs.

For local roads and city streets, the conditions of tolerability were much more flexible. Considerable weight was given to established local practices and policies. For example, there were many cases where no estimate of needs was made as long as a road was considered passable and as long as the users would accept the condition as tolerable.

CONSTRUCTION NEEDS, 1955-64

Estimates of construction needs (including right-of-way costs), summarized herein for the 10-year period 1955-64, were prepared by each State, the District of Columbia, Hawaii, and Puerto Rico. A number of States submitted revised estimates, a few of which were received too late to include in the final compilations of summary data. The totals reported by each State for each road system are listed in table 1, and nationwide totals are summarized in table 2. A graphic comparison of the 10-year construction needs, 1955-64, and the estimated 1965 mileages, by system, is shown in figure 1.

TABLE 1.—Highway construction needs, 1955-64 by system and State

[All amounts in millions of dollars.]

State	Federal-aid systems											Non-Federal-aid systems									All roads and streets				
	Interstate			Other Federal-aid primary			Federal-aid secondary			Total		Other State highways			Other roads and streets			Total							
	Rural	Urban	Total	Rural	Urban	Total	State	Local	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total				
Alabama.....	316	50	366	139	153	292	23	111	134	589	203	792	2	11	13	780	489	1,269	782	480	1,262	1,371	683	2,054	
Arizona.....	193	17	210	120	12	132	94	49	143	456	29	485				135	36	171	135	36	171	591	65	656	
Arkansas.....	171	32	203	223	26	249	271	78	349	743	58	801	10	5	15	107	161	268	117	166	283	860	224	1,084	
California.....	592	1,729	2,321	859	677	1,536	360	288	648	2,099	2,406	4,505	351	423	774	1,385	1,545	2,930	1,736	1,958	3,704	3,835	4,374	8,209	
Colorado.....	130	27	157	321	69	381	197	-----	197	648	87	735	6	-----	6	473	236	709	479	236	715	1,127	323	1,450	
Connecticut.....	185	370	555	237	381	618	166	41	207	629	751	1,380	229	144	373	157	144	301	386	288	674	1,015	1,039	2,054	
Delaware.....	45	21	66	81	26	107	83	-----	83	209	47	256	2	30	9	13	22	37	15	52	245	62	308		
Florida.....	360	138	498	107	724	831	242	74	316	783	860	1,643	62	158	220	124	43	167	186	201	387	969	1,061	2,030	
Georgia.....	569	131	700	467	174	641	189	166	355	1,391	305	1,696	56	31	87	268	206	474	324	237	561	1,715	542	2,257	
Iaho.....	98	9	107	169	9	178	64	35	99	366	18	384	8	1	9	153	21	174	161	22	183	627	40	567	
Illinois.....	547	518	1,065	726	256	982	31	108	139	1,412	774	2,186	223	182	405	439	1,447	1,886	662	1,629	2,291	2,074	2,403	4,477	
Indiana.....	475	392	867	816	303	1,119	385	362	747	2,038	695	2,733	18	33	51	741	681	1,422	759	714	1,473	2,797	1,409	4,206	
Iowa.....	220	55	275	978	194	1,172	-----	-----	514	514	1,712	249	1,961	3	1	4	390	132	522	893	133	526	2,103	382	2,487
Kansas.....	191	16	207	570	96	666	107	207	314	1,075	112	1,187	-----	-----	-----	277	198	475	277	198	475	1,332	310	1,662	
Kentucky.....	363	129	492	356	132	487	416	79	495	1,213	261	1,474	215	71	286	108	69	177	323	140	463	1,536	401	1,937	
Louisiana.....	246	247	493	159	73	232	256	3	259	664	320	984	215	56	271	66	241	307	281	297	578	945	617	1,562	
Maine.....	140	7	147	219	126	345	140	-----	140	499	133	632	105	18	123	84	31	116	189	49	238	688	182	870	
Maryland.....	155	279	434	212	284	496	201	57	258	625	563	1,188	14	14	28	219	80	308	233	103	336	858	666	1,524	
Massachusetts.....	144	694	838	340	285	625	94	318	412	896	979	1,875	9	3	12	361	201	562	370	204	574	1,266	1,183	2,449	
Michigan.....	807	488	1,295	1,385	440	1,825	532	736	1,268	3,460	928	4,388	57	105	162	656	1,496	2,151	712	1,601	2,313	4,172	2,529	6,701	
Minnesota.....	262	221	483	305	189	494	113	116	229	996	410	1,206	2	5	7	198	239	437	200	244	444	996	654	1,650	
Mississippi.....	222	24	246	270	33	303	80	47	127	619	57	676	17	4	21	128	98	226	145	102	247	764	159	923	
Missouri.....	436	163	599	699	178	877	308	-----	308	1,443	1,341	1,784	22	8	30	290	427	717	312	435	747	1,755	776	2,531	
Montana.....	141	12	153	317	4	321	-----	79	79	537	16	553	-----	-----	-----	1	170	25	195	170	28	196	707	42	749
Nebraska.....	90	16	106	159	31	190	112	57	169	418	47	465	2	2	4	191	161	352	193	163	356	611	210	821	
Nevada.....	63	10	73	83	10	93	20	21	41	187	20	207	2	-----	-----	2	3	8	11	5	8	13	192	28	220
New Hampshire.....	42	24	66	159	45	204	82	2	84	285	69	354	67	8	75	46	83	129	113	91	204	398	160	558	
New Jersey.....	223	1,134	1,357	625	1,081	1,706	17	232	249	1,097	2,215	3,312	22	70	92	344	875	1,219	366	945	1,311	1,463	3,160	4,623	
New Mexico.....	176	59	235	201	46	247	117	-----	117	494	105	599	74	23	97	182	128	310	256	151	407	750	256	1,006	
New York.....	638	698	1,336	2,063	1,293	3,356	483	406	889	3,590	1,991	5,581	7	18	25	268	553	821	275	571	846	3,865	2,562	6,427	
North Carolina.....	226	21	247	314	42	356	255	-----	255	795	63	858	6	15	21	182	155	337	188	170	358	983	233	1,216	
North Dakota.....	103	4	107	74	8	82	120	68	188	365	12	377	-----	-----	-----	1	49	57	105	49	58	107	414	70	484
Ohio.....	537	824	1,361	622	578	1,200	384	91	475	1,634	1,402	3,036	238	82	320	794	886	1,680	1,032	968	2,007	2,665	2,370	5,038	
Oklahoma.....	296	81	377	505	104	609	117	118	235	1,036	185	1,221	24	13	37	144	137	281	168	150	318	1,204	335	1,539	
Oregon.....	170	149	319	187	146	333	73	33	106	463	295	758	4	18	22	182	109	291	186	127	313	649	422	1,071	
Pennsylvania.....	360	400	760	1,074	482	1,556	1,422	18	1,440	2,874	882	3,756	1,165	85	1,250	433	276	708	1,598	360	1,908	4,472	1,242	5,714	
Rhode Island.....	7	116	123	117	128	245	28	10	38	162	244	406	13	11	24	25	31	56	38	42	80	200	286	486	
South Carolina.....	140	43	183	93	30	123	72	5	77	310	73	383	79	19	98	79	30	109	158	49	207	468	122	590	
South Dakota.....	85	9	95	141	23	164	100	57	157	384	32	416	7	-----	-----	7	7	61	41	102	68	41	109	452	73
Tennessee.....	261	119	380	472	115	587	184	61	245	978	234	1,212	-----	-----	-----	7	7	321	260	581	321	267	588	2,109	501
Texas.....	515	357	872	520	135	655	404	-----	464	1,499	492	1,991	260	29	289	651	743	1,394	911	772	1,683	2,410	1,264	3,674	
Utah.....	189	49	238	100	29	129	48	15	63	352	78	430	39	2	41	104	57	161	143	56	202	496	137	632	
Vermont.....	169	9	178	167	12	179	46	28	74	410	21	431	2	-----	-----	2	35	5	40	37	6	447	26	473	
Virginia.....	385	183	569	308	159	467	207	21	228	922	342	1,264	1	19	20	283	190	473	284	209	493	1,206	551	1,757	
Washington.....	193	274	467	427	57	484	257	50	307	927	331	1,258	64	33	97	283	331	614	347	364	711	1,274	695	1,969	
West Virginia.....	168	90	258	516	152	668	485	-----	485	1,169	242	1,411	-----	-----	-----	1	304	62	366	304	63	367	1,473	305	
Wisconsin.....	208	115	323	523	202	725	411	136	547	1,278	317	1,595	-----	-----	-----	366	424	790	366	424	790	1,644	741	2,385	
Wyoming.....	282	14	296	216	10	226	95	10	105	603	24	627	1	-----	-----	1	179	24	209	180	24	204	783	48	
Dist. of Columbia.....	-----	152	152	-----	153	153	9	-----	9	9	305	314	-----	-----	-----	10	10	-----	-----	-----	10	10	315	324	
Subtotal continental United States.....	12,536	10,717	23,253	19,740	9,906	29,646	9,960	4,907	14,867	47,143	20,623	67,766	3,729	1,742	5,471	13,226	13,873	27,099	16,955	15,615	32,570	64,096	36,238	100,336	
Hawaii.....	-----	-----	-----	59	41	100	52	-----	52	111	41	152	-----	-----	-----	13	21	34	13	21	34	124	62		

TABLE 2.—Summary of highway construction needs, 1955-64, by system

System ^{1,2}	[In billions]		
	Rural	Urban	Total
Interstate system.....	\$12.5	\$10.7	\$23.2
Other Federal-aid primary.....	19.9	10.0	29.9
Federal-aid secondary:			
Under State control.....	10.1		10.1
Under local control.....	4.9		4.9
Total Federal-aid secondary.....	15.0		15.0
Total Federal-aid.....	47.4	20.7	68.1
Other State highways.....	3.7	1.8	5.5
Other roads and streets.....	13.3	13.9	27.2
Total non-Federal-aid.....	17.0	15.7	32.7
Total, all roads and streets.....	64.4	36.4	100.8

¹ Figures include Hawaii and Puerto Rico. For the continental United States, the total is \$100.3 billion
² Costs include that of right-of-way.

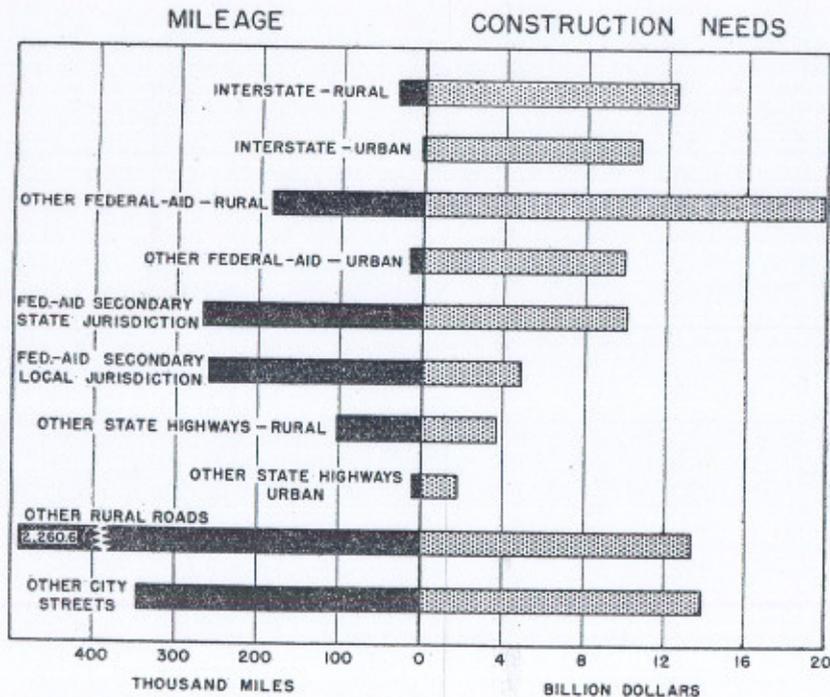


Figure 1.—Estimated 1965 mileage and 10-year construction needs, 1955-64, by system.

Unless otherwise separately identified, the various estimates presented here include those of Hawaii and Puerto Rico. A general discussion of the estimates for each road system follows.

Interstate system

Existing routes which approximate the location of the interstate system amount to about 37,700 miles. Of this total, 33,300 miles are

rural and 4,400 are in urban areas. About 15 percent of the mileage as it now exists is already adequate according to the standards established in this study.

These estimates include no allowances for any increase, by the end of 1964, of total mileage in the system. There will, however, be an increase of about 50 percent in traveled lanes. For a substantial portion of the system, nearly 7,000 miles, a 2-lane road will be adequate. The bulk of the proposed improvements, more than 28,000 miles, will be in the 4-lane divided highway category. About 2,300 miles will be 6 or more lanes wide. This latter mileage will, of course, be principally in and approaching the heavier populated areas. Figure 2 shows the approximate location and estimated status of improvement as to lane width, in 1965, of the rural portions of the interstate system.

Construction costs (including structures and right-of-way) on the interstate system range in average from \$200,000 a mile for 2-lane roads in rural areas to \$10 million a mile for multilane sections (over 6 lanes) in urban areas. There are, of course, wide variations from these averages among the States and for individual road sections. In terms of mileage to be constructed, the 4-lane road predominates. Costs of this 4-lane mileage average \$450,000 per mile, rural and \$1,600,000 per mile, urban.

Needed work on the interstate system during the 10-year period 1955-64, according to the State estimates, totals \$23.2 billion, of which \$12.5 billion is in rural and \$10.7 billion in urban areas.

This estimate provides for the development of the interstate system in its present designated extent of 37,700 miles. It does not take into account extensions which will undoubtedly be made within the legislative limitation of 40,000 miles—extensions which will in all probability be almost entirely within and adjacent to the larger urban areas. Estimates of the needs for improvement of these extensions must necessarily await their designation. To a certain extent, the needs are contained in the estimates reported for other road systems.

Other Federal-aid systems

About 75 percent of the presently designated Federal-aid primary system (excluding interstate system mileage) will need some kind of improvement during the 10-year period 1955-64. The comparable value for the Federal-aid secondary system is about 68 percent.

At the end of the 10-year period there will be about 201,000 miles of primary system mileage in service, 185,000 miles rural and 16,000 miles urban. The total of 201,000 miles represents an increase over the 193,000 miles in service in 1953, brought about by the inclusion of extensions anticipated by the States.

The Federal-aid secondary system is also expected to grow. On this system, however, the anticipated increase is somewhat larger in proportion, amounting to a 15-percent increase by 1964 over the miles in service in 1953. (On the basis of past rates, an increase of 20 to 25 percent is indicated.) The mileage in service at the end of the 10-year period on this system has been estimated by the States to be about 530,000 miles and is about evenly divided between roads under State control and those under local control.

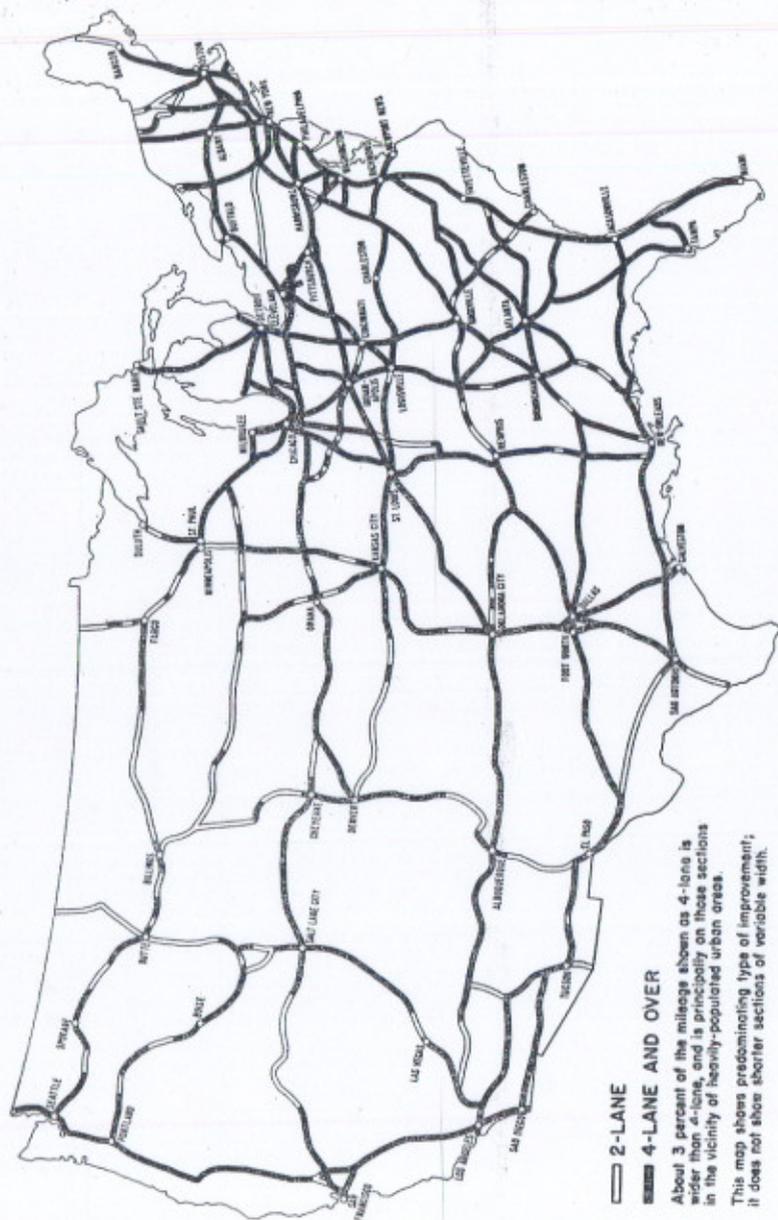


Figure 2.—Estimated status of Improvement of the National System of Interstate Highways as to lane width, in 1965.

Needed improvements on deficient mileage of the Federal-aid primary system average \$140,000 per mile on rural sections and \$800,000 per mile on urban sections. On the Federal-aid secondary system the average cost is about \$40,000 per mile. There are, of course, considerable variations in these average costs among and within the various States.

The kind of work also varies widely. From a fourth to a third of the mileage in need of improvement on the various systems requires only relatively minor work such as resurfacing or widening. Costs of such work are from a third to a half of the previously cited averages for all work.

At the other extreme are those needed improvements involving construction of a complete new road to replace an old one. The amount of such needed work varies on each system. For example, only one-tenth of the deficient mileage on the secondary system involves the construction of a complete new road on new location, whereas over a third of the needed improvements on the urban portions of the primary system is in this category. Costs of such new construction are about double the previously cited averages for all work. Between these extremes falls the remaining mileage of needed improvements, generally involving substantial reconstruction work along existing alignments.

The estimated work needed on the Federal-aid primary system (excluding the interstate system) during the 10-year period 1955-64 totals \$29.9 billion, of which \$19.9 billion is in rural and \$10 billion in urban areas.

The estimate of needs on the Federal-aid secondary system in the 10-year period totals \$15 billion, of which \$10.1 billion is for roads under State control and \$4.9 billion for roads under local control.

Other State highways

There are now in service 86,000 miles of non-Federal-aid roads and streets under the jurisdiction of State highway agencies—76,000 miles are rural and 10,000 miles are urban. The States anticipate substantial additions to this mileage. By the end of the 10-year period, it 1964, they estimate that 114,000 miles will be in service, 102,000 rural and 12,000 urban.

It was estimated that 59 percent of the existing rural mileage and 47 percent of the existing urban mileage will require improvement within the 10-year period. The cost of needed improvements averages \$51,000 per mile for rural mileage and \$260,000 per mile for urban mileage. There are wide variations in these averages, however, between and within States and by type of work. The total needed work on this mileage during the 10-year period 1955-64, according to State estimates, amounts to \$5.5 billion, of which \$3.7 billion is in rural and \$1.8 billion in urban areas.

Other rural roads and city streets

Over three-fourths of the national total road and street mileage is in the category of local service roads and streets. With a few relatively minor exceptions, this mileage is under the administrative jurisdiction of local units of government (below the State level). In existence at present are nearly 2,300,000 miles of rural roads and about 320,000 miles of urban streets. In 1964, at the end of the 10-year

period, the States anticipate a decrease of about 28,000 miles in rural mileage and an increase of about 28,000 miles in the urban category. These changes are not particularly significant, in relation to the total mileages.

About 54 percent of the existing rural mileage and 48 percent of the existing urban mileage will require improvement within the 10-year period. Costs of needed improvements average about \$11,000 a mile for rural roads and \$77,000 a mile for urban streets.

It is not contemplated that every mile of local roads and streets will be surfaced in the 10-year period. Although the time and means available for preparation of the estimates precluded the development of exact detail, it is known that about 400,000 miles of roads exist only as passable trails. These roads of low essentiality warrant little or no improvement for the limited service they render.

The estimate of needed work on local roads and streets during the 10-year period 1955-64 totals \$27.2 billion, of which \$13.3 billion is for rural roads and \$13.9 billion for city streets.

Itemization of costs

An itemization of the estimates of costs for the 10-year period 1955-64 for right-of-way, grading, surfacing, and structures is shown in table 3. Also shown are the numbers of new and replacement structures needed.

To provide maximum service on the interstate system in terms of capacity, speed, and safety, it is obvious that there should be strict adherence to those standards of design which have proved effective in accomplishing these objectives. The total cost is impressive. The magnitude and proportion of right-of-way and structure costs are particularly large—almost 50 percent more in percentage relation to the total than for any of the other systems.

Such expenditures are required to obtain control of access, long sight distances, easy grades and curves, grade separations and traffic interchanges, frontage roads, and the like. Provision of these features, characteristic of the interstate system, makes improvement of these routes cost as much as one-third more than other Federal-aid primary roads in rural areas, and even more in urban areas. For this added cost, the interstate system roads will have longer service lives and will be capable of carrying twice as much traffic as other roads not incorporating these features, and will carry it more efficiently.

Looming in importance both on a cost basis and a percentage basis is the magnitude of the right-of-way problem in urban areas. The total urban right-of-way costs for the 10-year period are estimated at \$8.2 billion, 23 percent of all urban costs and 8 percent of the entire \$101 billion estimate. The problems and costs involved in acquiring right-of-way have been among the principal deterrents in urban construction programs. The longer acquisition is deferred, the greater will be the difficulties in obtaining satisfactory rights-of-way.

As might be expected, the costs of both right-of-way and structures, in amount and in percentage of system cost, are greatest for the urban portion of the interstate system. The average cost per mile of right-of-way alone in urban areas is more than double the total cost per mile in rural areas, on the interstate system.

TABLE 3.—Itemization of highway construction needs, 1955-64, by system

System ¹	Cost (in billions)					Number of structures Thousands	Percentage of system cost				
	Right-of-way	Grading	Surfacing	Structures	Total		Right-of-way	Grading	Surfacing	Structures	Total
Interstate system:											
Rural.....	\$1.4	\$3.8	\$4.1	\$3.2	\$12.5	18.7	11	30	33	28	100
Urban.....	3.3	1.9	1.4	4.1	10.7	6.5	31	18	13	38	100
Total.....	4.7	5.7	5.5	7.3	23.2	25.2	20	25	24	31	100
Other Federal-aid primary:											
Rural.....	1.9	6.5	8.0	3.5	19.9	37.0	9	33	40	18	100
Urban.....	2.6	2.3	2.5	2.6	10.0	6.4	26	23	25	26	100
Total.....	4.5	8.8	10.5	6.1	29.9	43.4	15	30	35	20	100
Federal-aid secondary:											
Under State control.....	.9	3.6	4.1	1.5	10.1	38.2	9	36	40	15	100
Under local control.....	.4	1.6	2.0	.9	4.9	35.0	8	33	41	18	100
Total.....	1.3	5.2	6.1	2.4	15.0	73.2	9	34	41	16	100
Other State highways:											
Rural.....	.3	1.4	1.4	.6	3.7	18.1	8	38	38	16	100
Urban.....	.4	.5	.5	.4	1.8	1.7	22	28	28	22	100
Total.....	.7	1.9	1.9	1.0	5.5	19.8	12	35	35	18	100
Other roads and streets:											
Rural roads.....	.6	4.8	5.4	2.5	13.3	130.1	4	36	41	19	100
City streets.....	1.9	3.5	6.2	2.3	13.9	12.9	14	25	45	16	100
Total.....	2.5	8.3	11.6	4.8	27.2	143.0	9	30	43	18	100
SUMMARY											
Federal-aid:											
Rural.....	4.6	15.5	18.2	9.1	47.4	128.9	10	33	38	19	100
Urban.....	5.9	4.2	3.9	6.7	20.7	12.9	29	20	19	32	100
Total.....	10.5	19.7	22.1	15.8	68.1	141.8	15	29	33	23	100
Non-Federal-aid:											
Rural.....	.9	6.2	6.8	3.1	17.0	148.2	5	37	40	18	100
Urban.....	2.3	4.0	6.7	2.7	15.7	14.6	15	25	43	17	100
Total.....	3.2	10.2	13.5	5.8	32.7	162.8	10	31	41	18	100
All systems:											
Rural.....	5.5	21.7	25.0	12.2	64.4	277.1	8	34	39	19	100
Urban.....	8.2	8.2	10.6	9.4	36.4	27.5	23	23	29	25	100
Total.....	13.7	29.9	35.6	21.6	100.8	304.6	14	30	35	21	100

¹ Figures include Hawaii and Puerto Rico. For the continental United States, the total is \$100.3 billion.

CONSTRUCTION NEEDS AFTER 1964

There is no foreseeable period in the future when there will be no highway needs. Population growth and other factors in the expanding economy of the United States give every indication that highway travel will continue to increase in the years beyond 1964. Admittedly any attempt to gage with exactness the trend of such future travel, and its attendant highway needs, involves certain hazards. But the alternative of ignoring these future needs is even more hazardous. Sound and defensible long-range highway planning must be based on the best current estimates that can be made of future conditions.

Simply to sustain the investment in the highway plant at the stage of development existing at the end of 1964 will require substantial continuing capital outlays in the years after 1964. For example, by the end of 1964 the highway plant then in service will represent an investment (cost new, 1954 prices) of \$140 billion to \$150 billion. On the basis of a 30- to 35-year life of investment, it would require an average construction expenditure of \$4 billion or more annually to offset the depreciation which would be taking place. In addition, as highway facilities wear out and require rebuilding, provision must be made for substantial upgrading to take care of still further traffic growth.

In recognition of these future needs in the years following the initial 10-year period, each State supplied an estimate of such costs for each road system for the 20-year period 1965-84. These costs, as reported by the States, amounted to \$114.4 billion for all road systems combined. The distribution of this total by systems is shown in table 4.

TABLE 4.—Summary of highway construction needs, 1965-84, by system

(In billions)

System ^{1 2}	Rural	Urban	Total
Interstate system.....	\$5.1	\$4.6	\$9.7
Other Federal-aid primary.....	25.0	11.0	36.0
Federal-aid secondary:			
Under State control.....	12.7		12.7
Under local control.....	8.1		8.1
Total Federal-aid secondary.....	20.8		20.8
Total Federal-aid.....	50.9	15.6	66.5
Other State highways.....	5.2	1.8	7.0
Other roads and streets.....	21.5	19.4	40.9
Total non-Federal-aid.....	26.7	21.2	47.9
Total, all roads and streets.....	77.6	36.8	114.4

¹ Figures include Hawaii and Puerto Rico. For the continental United States, the total is \$113.9 billion.

² Costs include that of right-of-way.

Significant relations are revealed by comparing the capital outlay amounts during the 20-year period 1965-84 (table 4) with those for the initial 10-year period 1955-64 (table 2). Probably the most important is that for the interstate system. The needs from 1965 to 1984 are less than half the needs for the first 10 years, 1955-64. For other road systems the 1965-84 needs are greater than those of the initial 10-year period. The reason for this, of course, is that the 1955-64 estimates for development of the interstate system provide that by 1964 it shall be adequate for 1974 traffic. This substantially delays the accrual of replacement needs for a considerable period after 1964. The estimates for other road systems are based on the assumption that they will be adequate for 1964 traffic, thus requiring continuing construction, reconstruction, and upgrading of wornout sections in substantial amount in 1965 and later years.

RELATION OF HIGHWAY NEEDS TO THE NATIONAL ECONOMY

The goal of 1964 for achievement of adequacy for all types of highways was adopted because the Congress requested an estimate " * * * of the cost of completing the several systems * * *" and it was assumed that attainment of adequacy at the earliest possible date was intended. In addition, a single date had to be adopted to assure a common statistical basis for use by the various States in their separate estimates. It is not intended to imply that all needs for highway improvement are equally urgent, or that all needs should be met in the next decade at the expense of other urgent national needs.

To meet all highway needs in 10 years, and maintain adequacy thereafter, construction requirements would be as shown in figure 3, which presents the needs for each 5-year period from 1955 to 1984, with indications of the needs of the interstate system, other Federal-aid systems, and the non-Federal-aid systems. The \$215.2 billion total represented includes the \$100.8 billion from table 2 and the \$114.4 billion from table 4.

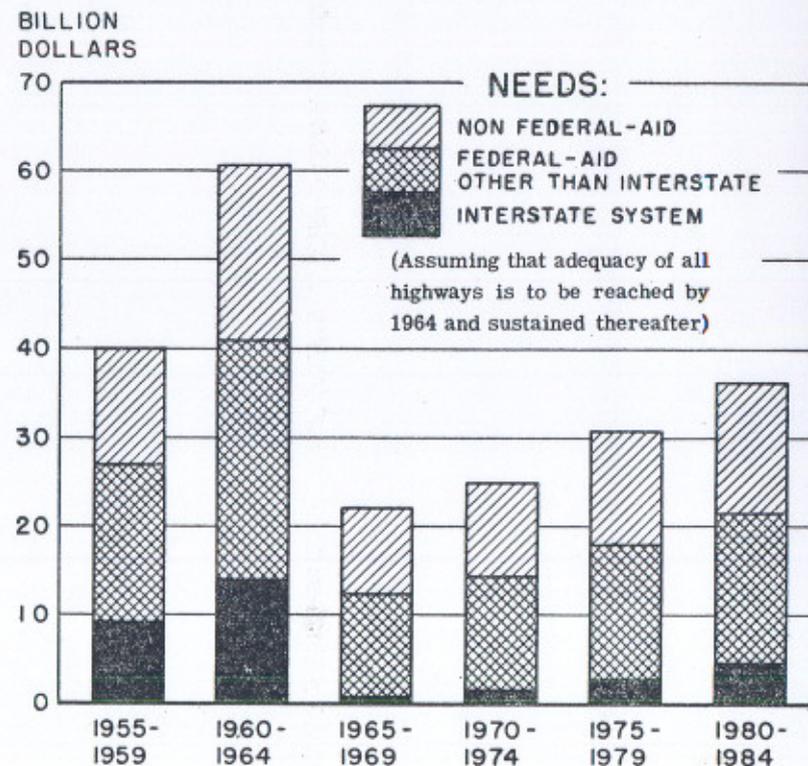


Figure 3.—Construction needs of the Federal-aid and non-Federal-aid systems, 1955-84.

A highway program to meet all needs in 10 years would get under way gradually, and taper off at the end. The needs to be met in 1955 and in 1964 would be less than the \$8 billion and \$12 billion annual averages indicated by the first two bars. Thereafter, the needs for replacement and expansion would start with about \$4.3 billion in 1965 and increase gradually to about \$7.5 billion in 1984. For the intervening years, the annual rates of increase would vary somewhat due to cyclical effects of replacement of the relatively large amount of construction placed in service during the initial 10-year period 1955-64.

Thus an attempt to meet the goal of adequacy of all highways by 1964 would produce a heavy concentration of construction expenditures in the 1955-64 decade and a sharp drop in the immediately following years (see figs. 3 and 4). A more uniform rate of expenditures, however, would appear more consistent with overall economic and fiscal policies. Because of its importance in the national economy and in national defense, the interstate system undoubtedly should be of first priority in any overall highway program of the future. The generally less urgent needs of the other systems could be met more gradually.

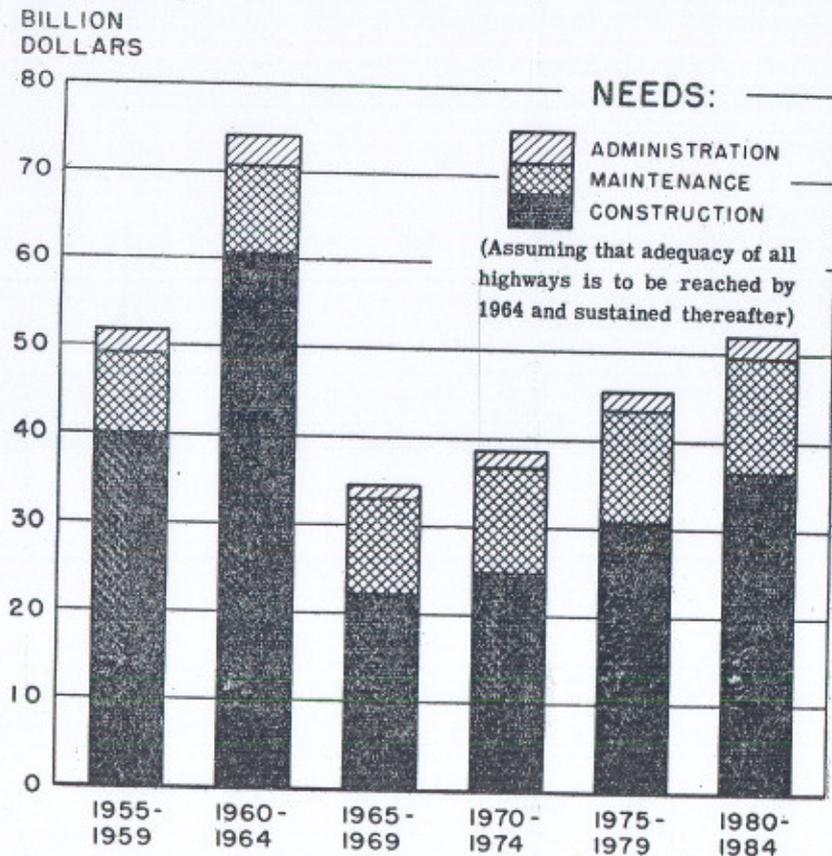


Figure 4.—Total needs of all systems, 1955-84.

It is of interest to examine the highway construction expenditures of the past, and those estimated as future needs, in comparison with the gross national product, which is a measure of the Nation's economy.

In the early 1920's, highway construction expenditures averaged 1.2 percent of the gross national product, and gradually increased to a peak of 1.8 percent in 1931. The ratio declined somewhat, to a low of 1.2 percent in 1935, rose again to 1.7 percent in 1938, and thereafter dwindled to a low of 0.2 percent during World War II. In the first postwar years the figure climbed rapidly, reaching 0.8 percent in the 4 years 1949-52, and continued upward to 1.1 percent in 1954.

Fulfillment of all highway needs within a 10-year period would require, during 1955-64, construction expenditures averaging 2.4 percent of the anticipated gross national product, with a range from 1.2 percent in 1955 up to 3.0 percent in 1960 and 1961 and back to 2.1 percent in 1964.

If the needs were so fulfilled, construction needs for replacement and expansion thereafter would continue at a fairly constant proportion of the gross national product, averaging about 0.8 percent a year.

MAINTENANCE NEEDS

Maintenance needs are additional to construction needs and must be considered in the total costs of a highway program. In 1955, maintenance expenditures for all road and street mileage in the United States will total about \$1.75 billion, according to estimates furnished by each State. The distribution of this total by principal items of expense is as follows:

	Percent
Roadside.....	32
Surface.....	48
Structures.....	8
Snow and ice control.....	12
Total.....	100

Maintenance costs per mile range from a nationwide average of \$250 per mile for local roads to \$2,900 per mile for urban streets on the interstate system as it now exists. By 1965 the States estimate that the needed annual expenditure for maintenance will rise about 22 percent above the 1955 total, in order to provide adequate maintenance on the roads and streets at the stage of development that will exist at the end of the 10-year period. The States also estimated maintenance needs for the 20-year period 1965-84. The total maintenance needs in 1984 will average about 57 percent above the 1954 level for all systems, combined.

The total estimated maintenance needs are shown for each system in table 5, broken down into amounts for the first 10 years, 1955-64, and for the next 20 years, 1965-84.

TABLE 5.—Maintenance needs, 1955-64 and 1965-84, by system

[In billions]

System ¹	First 10 years, 1955-64			Next 20 years, 1965-84		
	Rural	Urban	Total	Rural	Urban	Total
Interstate system ²	\$0.6	\$0.1	\$0.7	\$1.6	\$0.4	\$2.0
Other Federal-aid primary.....	2.6	.4	3.0	6.5	1.1	7.6
Federal-aid secondary:						
Under State control.....	2.2	-----	2.2	5.7	-----	5.7
Under local control.....	1.7	-----	1.7	4.1	-----	4.1
Total Federal-aid secondary.....	3.9	-----	3.9	9.8	-----	9.8
Total Federal-aid.....	7.1	.5	7.6	17.9	1.5	19.4
Other State highways.....	.7	.2	.9	1.9	.5	2.4
Other roads and streets.....	6.4	4.5	10.9	15.7	11.3	27.0
Total non-Federal-aid.....	7.1	4.7	11.8	17.6	11.8	29.4
Total, all roads and streets.....	14.2	5.2	19.4	35.5	13.3	48.8

¹ Figures include Hawaii and Puerto Rico. For the continental United States, the 1955-64 total is \$19.3 billion and the 1965-84 total is \$48.6 billion.

² Due to rounding of figures, the interstate system needs are somewhat understated for 1955-64. The estimates are \$618 million for rural and \$143 million for urban.

With the exception of the interstate system, the maintenance cost estimates appear reasonable. Lack of sufficient experience on the part of many States in maintaining the types of highway built to interstate system standards may have resulted in some underestimating of the costs on that system. In States, for example, where an appreciable mileage of divided highways now exists (100 miles or more), the estimated costs of maintaining mileage built to interstate system standards were higher than for other States which have had only limited experience in maintaining such facilities. Using the data from the more experienced States as a guide, it is probable that, on a nationwide basis, the estimates of maintenance needs for the interstate system as it will exist in 1965 and future years are understated by about 20 percent. Since it was considered preferable to retain the estimates reported by the States to the maximum possible extent, no revisions have been made in the entries in table 5 to reflect this possible increase.

ADMINISTRATIVE COSTS

In addition to estimating future construction and maintenance costs for the several road systems, each State also prepared an estimate of those administrative costs which were not included elsewhere in the estimates. Highway patrol and other traffic police costs were not included.

Administrative costs were estimated to be slightly less than 5 percent of the combined total cost of construction and maintenance for all systems combined. Minor variations exist with respect to individual systems. The percentage was slightly lower than the average on local roads and streets and slightly above the average on the interstate system and other Federal-aid primary highways. Considerably wider variations existed between individual States. Such differences can be expected, however, because of varying practices among the States in accounting for administrative costs. Some elect

to retain such costs in a separate account whereas others include a substantial proportion in the construction and maintenance accounts. In either event, the administrative costs, as herein summarized, represent the net amount of such costs not elsewhere included.

Table 6 shows, by system, the amounts of the administrative costs, as determined from the States' estimates, for the initial 10-year period 1955-64, and for the following 20-year period 1965-84.

TABLE 6.—Administrative needs, 1955-64 and 1965-84, by system

[In billions]

System ¹	1st 10 years, 1955-64			Next 20 years 1965-84		
	Rural	Urban	Total	Rural	Urban	Total
Interstate system.....	\$0.7	\$0.6	\$1.3	\$0.4	\$0.3	\$0.7
Other Federal-aid primary.....	1.2	.5	1.7	1.6	.6	2.2
Federal-aid secondary:						
Under State control.....	.6	-----	.6	.9	-----	.9
Under local control.....	.3	-----	.3	.6	-----	.6
Total Federal-aid secondary.....	.9	-----	.9	1.5	-----	1.5
Total Federal-aid.....	2.8	1.1	3.9	3.5	.9	4.4
Other State highways.....	.2	.1	.3	.3	.1	.4
Other roads and streets.....	.9	.8	1.7	1.6	1.4	3.0
Total non-Federal-aid.....	1.1	.9	2.0	1.9	1.5	3.4
Total, all roads and streets.....	3.9	2.0	5.9	5.4	2.4	7.8

¹ Figures include Hawaii and Puerto Rico. For the continental United States the above rounded totals are unchanged.

TOTAL NEEDS

Figure 4 shows the total highway needs for each 5-year period, starting from 1955, to the end of 1984. Portions of each bar representing construction are the same as the total heights of bars in figure 3. The amounts for maintenance and administration are shown in addition. The first 2 bars represent the 10-year needs total of \$126.1 billion, consisting of \$100.8 billion for construction, \$19.4 billion for maintenance, and \$5.9 billion for administration. The remaining 4 bars represent additional needs for these 3 purposes from 1965 to 1984: The \$171.0 billion total for the 20-year period consists of \$114.4 billion for construction, \$48.8 billion for maintenance, and \$7.8 billion for administration.

The total estimated needs for the entire 30-year period from 1955 to 1984, then, amount to \$297.1 billion, of which 72 percent is for construction, 23 percent for maintenance, and 5 percent for administration.

Over the 30-year period the total needs average out to \$9.9 billion a year. By way of comparison, the estimated total expenditure (exclusive of debt service) for all roads and streets in 1954 was \$6.1 billion, of which 64 percent was for construction.

FINANCING THE HIGHWAY NEEDS

The cost of bringing the Nation's roads and streets to adequacy in 10 years has been estimated at \$100.8 billion. If the present rates of taxation of motor fuel are continued and the present structures of

registration fees and other special user taxes are continued, if allowance is made for the estimated increases in vehicle registration and use of motor fuel during the next 10-year period, and if the current rates of expenditures for maintenance and administration are continued, it is estimated that \$47 billion will become available for highway construction. Thus a deficit of \$54 billion must be overcome if the estimated 10-year needs are to be met.

Should the interstate system be completed in that period, on the basis of these cost estimates, it would be in a condition adequate for 1974 traffic, and need for expenditures on that system would drop sharply. On the other systems, however, improvements in the 10-year period would be confined to sections that otherwise would be inadequate for 1964 traffic. Thus, as shown in figures 3 and 4, expenditures for construction on the other systems, and maintenance and administration costs on all systems, would continue to be substantial and would steadily increase.

Decision as to a suitable financing program must take into consideration the proportion of the total cost that can and should be borne by each of the various jurisdictions involved—Federal, State, and local. Decision must also be influenced by the amount of expenditure that may properly be devoted to highway construction during any period in relation to expenditures for other public works and in relation to the entire economy of the country. And decision must also take into consideration the means by which funds can be made available—such means as general taxation, highway-user taxation, and borrowing through general-obligation or toll-revenue bonds. All these means are used, singly or in combination, in financing the various segments of our highway systems.

Recognizing the need for a broad review of the whole problem of highway needs and finance, the President, since the passage of the 1954 Federal-Aid Highway Act, appointed an Advisory Committee on a National Highway Program to recommend a means for modernizing the Nation's road and street network. The President also requested the governors to review the same problem and advise him as to the manner in which the States could most effectively cooperate with the Federal Government in its solution.

A special committee representing the governors was set up, and its recommendations were transmitted to the President in the report of the Executive Committee of the Governors' Conference, in December 1954. This report recommended that—

for purposes of financing, the various highway systems should be divided into three categories—the interstate system, including essential urban access roads, other Federal-aid systems, and the State and local systems.

It further recommended that (1) the Federal Government should assume primary responsibility, with State participation, for financing the interstate system, and (2) so long as the Federal Government levies excise taxes on motor fuels, lubricants, and motor vehicles, it should continue to make allocations to the States for highway construction on the other Federal-aid systems.

This report is particularly significant in that it did not recommend that the Federal Government relinquish excise taxes on motor fuels, lubricants, and motor vehicles. The governors' representatives also recommended that the cost of meeting the total highway construction

needs should be divided between the Federal Government and the State and local governments in the ratio of 30 percent Federal and 70 percent State and local.

State and local governments have responsibility for the entire cost of constructing those road systems for which Federal aid is not available and for matching in statutory ratio the Federal funds provided for participation in the cost of construction on the Federal-aid systems. Of approximately 3,400,000 miles of roads and streets about 230,000 miles are included in the Federal-aid primary system and 460,000 in the Federal-aid secondary system. It is in the improvement of these systems, totaling about 700,000 miles, that the States and local agencies participate with the Federal Government in varying degree. Thus nearly 2,700,000 miles are the sole responsibility of the State and local jurisdictions.

Provision of funds required by State and local agencies to meet their historic responsibilities for highways presents serious problems that have been met in various ways. Many State and local governments are actively working to provide increased funds for highway purposes. The means proposed to supply the added funds vary widely with local conditions and the policies of the various jurisdictions.

The problem of financing the Federal share of meeting the total highway needs was considered by the President's Advisory Committee on a national highway program. In its report of January 1955, the Committee sets forth its conclusions and recommendations covering Federal participation in financing needed improvements on the interstate and other Federal-aid systems.

The plan of the President's Advisory Committee is in accord with the principles expressed in the report by the executive committee of the Governors' Conference. The plan was transmitted by the President to the Congress for use in its deliberations on the highway program. It contains detailed recommendations for financing the portion of the total highway needs recognized by the Advisory Committee and also by representatives of the governors as the responsibility of the Federal Government.

In developing its financing plan the Advisory Committee had the benefit of information on the extent and cost of improvements required on the various highway systems, supplied to the Bureau of Public Roads by the State highway departments to enable the Secretary of Commerce to respond to the provisions of section 13 of the Federal-Aid Highway Act of 1954. The Advisory Committee's recommendations, therefore, are regarded as meeting the provisions of that section of the act with respect to a study of highway financing, since they cover the Federal responsibilities insofar as the Committee believed they can be foreseen at this time.

In essence, the President's Advisory Committee recommends a total construction expenditure by the Federal Government of \$31.225 billion over the next 10 years. Of this total, \$25.00 billion is for the interstate system including essential urban arterial connections, \$3.15 billion for the remainder of the Federal-aid primary system, \$2.10 billion for the Federal-aid secondary system, \$0.75 billion for the Federal-aid urban system, and \$0.225 billion for forest highways. Financial participation by State and local governments would amount to \$2.00 billion on the interstate system including essential urban

arterial connections. For the other Federal-aid systems, statutory matching requirements would remain unchanged and would amount to slightly less than the Federal contributions of \$6.225 billion. To meet the total estimated cost of \$45.005 billion needed to bring these other Federal-aid systems (and the forest highway system) up to adequacy in the 10-year period, however, would require a total expenditure by the State and local governments of \$38.78 billion in addition to Federal funds.

The program recommended by the Advisory Committee calls for substantially increased Federal expenditures. Adoption of this program would give definite promise of early completion of the interstate system, so essential to the national defense and the Nation's economy, and continued support to the other Federal-aid systems.

The amount of funds required to bring the road systems to adequacy in a reasonable time, and to sustain them in a state of adequacy, is large. Should the cost be distributed among all vehicles, over the life of the roads, the additional cost per mile of travel would be very small, amounting to about one-quarter of a cent per vehicle-mile. About three-fourths of a cent per vehicle-mile is now being collected in the form of road-user taxes. These amounts may be compared to the cost of owning and operating a vehicle, which for passenger cars is variously estimated at from 8 to 10 cents per mile, and for trucks at correspondingly higher figures. The cost of the highway itself is but a small part of the total cost of motor-vehicle transportation.



PROGRESS AND FEASIBILITY
OF TOLL ROADS AND THEIR RELATION
TO THE FEDERAL-AID PROGRAM

LETTER

FROM

SECRETARY OF COMMERCE

TRANSMITTING

A REPORT OF THE PROGRESS AND FEASIBILITY OF
TOLL ROADS, WITH PARTICULAR ATTENTION TO THE
POSSIBLE EFFECTS OF SUCH TOLL ROADS UPON
THE FEDERAL AID HIGHWAY PROGRAMS, INCLUDING
RECOMMENDATIONS WITH RESPECT TO FEDERAL
PARTICIPATION IN TOLL ROADS



APRIL 14, 1955.—Referred to the Committee on Public Works and
ordered to be printed with illustrations

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1955

LETTER OF TRANSMITTAL

THE SECRETARY OF COMMERCE,
Washington 25, April 14, 1955.

HON. SAM RAYBURN,
Speaker of the House of Representatives,
Washington 25, D. C.

MY DEAR MR. SPEAKER: I transmit herewith a report of the progress and feasibility of toll roads, with particular attention to the possible effects of such toll roads upon the Federal-aid highway programs, including recommendations with respect to Federal participation in toll roads.

The report was prepared by the Commissioner of Public Roads with the aid of information supplied by the State highway departments, pursuant to section 13 of the Federal-Aid Highway Act of 1954. This report completes the directive contained in section 13, since a report on the costs of completing the several systems of highways in the several States, and the financing thereof, was submitted to the Congress on March 25, 1955.

The report describes the progress of recent toll-road development in the United States and gives consideration to the additional mileage that might be feasibly constructed through toll financing. It also discusses the effect of toll roads on the Federal-aid program, and makes recommendations with respect to Federal participation in toll roads.

Sincerely yours,

SINCLAIR WEEKS,
Secretary of Commerce.

PROGRESS AND FEASIBILITY OF TOLL ROADS

STEPS TOWARD DEVELOPMENT OF MAIN HIGHWAYS SINCE 1939

With few exceptions, the toll highways now in use and under construction follow closely the general lines of the National System of Interstate Highways. The exceptions are principally roads of local rather than national significance and include roads leading to resort areas and a number of parkways, some of which were built as free roads but on which tolls are now levied, not with the expectation of liquidating the cost of the particular roads, but rather to provide revenue to help finance other routes.

The study of the feasibility of additional toll roads made for the purposes of this report shows that nearly all the additional mileage estimated to be feasible of toll financing also lies along the general lines of the Interstate System.

It is of interest, therefore, to trace the origin and development of this system, on which lie the greatest part of the toll-road mileage either existing or under construction, and additional mileage found to be most feasible of toll financing.

Toll roads and free roads report

The Federal-Aid Highway Act of 1938 directed the Chief of the Bureau of Public Roads to investigate—

* * * the feasibility of building, and cost of, superhighways not exceeding three in number, running in a general direction from the eastern to the western portion of the United States, and not exceeding three in number, running in a general direction from the northern to the southern portion of the United States, including the feasibility of a toll system of such roads.

The report on the Bureau's investigation, transmitted by the President to the Congress on April 27, 1939,¹ after defining the most suitable locations of the six routes, found that their construction would be feasible. The Bureau concluded, however, as stated in the report (p. 3), that—

* * * a sound Federal policy for the construction of a system of transcontinental superhighways, traversing the entire extent of the United States from east to west and from north to south, cannot rest upon the expectation that the costs of construction and operating such a system as a whole would be recoverable, in their entirety or in any large part from direct tolls collected from the users.

The report stated that at that time the construction and operation of limited sections might be financed through the collection of tolls, and listed the various sections of the routes studied in the order in which their costs might be recoverable through tolls.

Information assembled in the preparation of the 1939 report, the first ever made on a national basis to show usage and importance of our highways, strongly emphasized the essentiality of a national system of interregional highways. The findings of the study led the

¹ Toll Roads and Free Roads, 76th Cong., 1st sess., H. Doc. No. 272.

Bureau to state that the Federal Government could contribute to the important improvements required by authorizing the designation of such a system by joint action of the Federal Government and the States, the system to be limited to 1 percent of the country's rural road mileage, with appropriate urban connections. The Bureau further proposed, in the report (p. 122), that—

In view of the predominant national importance of such a system, the Federal Government could reasonably contribute to its construction in a proportion materially larger than that in which it contributes under the Federal Highway Act * * *.

Interregional highways report

For a further study of the recommendations of the Bureau, the President on April 14, 1941, appointed a committee, known as the National Interregional Highway Committee, headed by the Commissioner of Public Roads, to investigate the need for a limited system of highways to improve the facilities then available for interregional transportation. Under the general direction of this committee the Bureau of Public Roads continued its investigations that led to the recommendations of the 1939 report and prepared the report *Interregional Highways*² which the President transmitted to the Congress on January 12, 1944.

Since the Commissioner of Public Roads served as Chairman of the Committee, the report also satisfied the requirement of the 78th Congress which, by Public Law 146 (57 Stat. 560), authorized and directed the Commissioner to survey the need for a system of express highways throughout the United States, the number of such highways needed, the approximate routes which they should follow, and the approximate cost of construction.

This report (p. 133) reiterated the importance of an interregional system of highways and again recommended that its immediate designation be authorized by the Congress. The committee strongly recommended—

* * * prompt beginning of construction on the system at the end of the war and prosecution of such construction at the rate indicated by an annual expenditure of \$750 million.

The interstate system

Influenced by the recommendations of the committee report, the Congress in section 7 of the Federal-aid Highway Act of 1944 (58 Stat. 838), authorized the designation of a National System of Interstate Highways. The act stated:

Sec. 7. There shall be designated within the continental United States a National System of Interstate Highways not exceeding forty thousand miles in total extent so located as to connect by routes, as direct as practicable, the principal metropolitan areas, cities, and industrial centers, to serve the national defense, and to connect at suitable border points with routes of continental importance in the Dominion of Canada and the Republic of Mexico. The routes of the National System of Interstate Highways shall be selected by joint action of the State highway departments of each State and the adjoining States, as provided by the Federal Highway Act of November 9, 1921, for the selection of the Federal-aid system. All highways or routes included in the National System of Interstate Highways as finally approved, if not already included in the Federal-aid highway system, shall be added to said system without regard to any mileage limitation.

No funds were earmarked for the acceleration of the improvement of the system nor did the Federal Government then accept responsi-

² *Interregional Highways*, 78th Cong., 2d sess., H. Doc. No. 379.

bility for the financing of projects on the system in a ratio larger than the customary 50-50 ratio applicable to other Federal-aid projects. Since the routes of the system, under the terms of the act, were to become a part of the Federal-aid system, financing of their improvement was expected to be from funds available for that system.

It was not until 1952 that funds were authorized specifically for expenditures on the Interstate System only, and then in the token amount of \$25 million annually. It remained for the Federal-aid Highway Act of 1954 to increase this authorization to a more substantial sum, \$175 million annually, and to increase the Federal contribution to the cost of projects on the system from 50 to 60 percent.

Increasing inadequacy of highways

The early study of the feasibility of toll roads, reported in 1939, was made toward the end of nearly a decade of economic depression. Traffic volumes had recovered but slowly from their decline in 1932 and 1933, and in 1938 had barely held even at the level reached in 1937.

With World War II came the restrictions to travel that reduced traffic volumes to less than two-thirds of their prewar level. At the same time highway construction was curtailed. Highways were regarded as expendable, and were expended. Then, with the return of peace, came an economic upsurge unexpected in its proportions, and with it a parallel and equally unexpected upsurge in traffic.

By 1947 traffic volumes exceeded their prewar level, and in 1950 the curve of traffic volume passed through the projection of the prewar trend of increase. In 1954 traffic volume was nearly double that of 1940, nearly triple that of the low of 1933, and the increase still continues.

Thus, emerging from a war period, the highway systems, abnormally depreciated as a result of the heavy wartime usage and the stoppage of normal replacement, were in no case prepared to meet the unforeseen and increasingly insistent demands of a growing traffic. And it was on the Interstate System, particularly in and near cities where travel was already heaviest, that the inadequacies were greatest.

Insufficiency of current revenues

It has become increasingly apparent that public funds applicable to highway construction, especially on the more important routes, have not been sufficient to prevent their increasing obsolescence. On the contrary, the conclusion is clear that the condition of the more important highways is falling steadily further behind the needs of traffic. It has likewise become more apparent that the gap will not be closed by the use of current revenues on a pay-as-you-go basis at the present rates of taxation. Although tax rates and other fees have been raised to some extent, the increases have not even offset the higher road costs resulting from wartime and postwar inflation.

A further deterrent to accelerating construction on the more important routes is the general practice of earmarking funds specifically for expenditure on particular systems. Moreover, as a matter of policy or legislative requirement, it is usually not practicable to concentrate funds for a particular system on a limited mileage of that system. More often, funds are spread as uniformly as practicable over the entire system.

Efforts by the States to obtain funds in sufficient amount for desirable Interstate System improvements through increased taxes or the authorization of general-obligation bonds have generally failed or have been inadequate. Proposals to borrow funds for improvements which may be thought to benefit principally motorists from other States can hardly be expected to find favor with the voters of any State.

The Congress has recognized the importance of encouraging the capitalization of future revenues, and section 5 of the Federal-Aid Highway Act of 1950 (64 Stat. 785) provided as follows:

Sec. 5. Any State, county, city, or other political subdivision that shall issue bonds and use the proceeds of such bonds for the construction of toll-free facilities in order to accelerate the improvement of the National System of Interstate Highways, the Federal-aid primary highway system, or the Federal-aid highway system in urban areas, may apply any portion of the funds herein, or hereafter, authorized for expenditure on said systems of highways and apportioned to such State under the provisions of section 1 to aid in retirement of annual maturities of the principal indebtedness of such bonds to the extent that the proceeds of such bonds are actually expended in the construction of said systems of highways: * * *.

Four States have availed themselves of this means of accelerating improvement of their highway systems up to March 1, 1955. A total of 180 projects having an estimated total cost of \$116,006,860, of which \$66,108,358 may eventually be paid from Federal-aid funds, had been programed in the 4 States for the improvement of 656.8 miles of highway under the bond program.

Since the end of World War II the demand for solution of traffic problems on main highways has become increasingly urgent. At the same time there has been no provision of public funds, or steps toward financing, that offered relief within a reasonable period of years. In this situation some of the States have resorted, in increasing degree, to toll financing of highways, in order to effect a solution when it was felt delay could not longer be tolerated.

PRESENT TOLL ROAD DEVELOPMENT

Pennsylvania Turnpike

The first of the modern toll roads was the Pennsylvania Turnpike. The possibility of using the right-of-way of the never-completed South Penn Railroad, on which tunnels already penetrated several of the parallel mountain ranges, had long been envisioned. In contrast to driving over the winding road that crossed the mountains on steep grades, the prospect of traveling rapidly and easily through these barriers was most inviting. After much official and unofficial discussion in the State, the Pennsylvania Legislature created the Pennsylvania Turnpike Commission in 1937, with authority to finance, construct, and operate a turnpike from Middlesex to Irwin (roughly, Harrisburg to Pittsburgh).

Despite the topographic conditions that gave the low-gradient route an unusual advantage, and despite the large volume of truck traffic moving between the population and industrial centers at the ends of the proposed turnpike, all efforts to sell bonds to private banking interests were unsuccessful.

Turning then to Federal sources, the Commission succeeded in obtaining grants totaling \$29.5 million from the Public Works Administration and, with over 40 percent of the needed capital then at hand, sold \$40.8 million of Turnpike bonds to the Federal Reconstruction Finance Corporation. These bonds, bearing 3¼ percent interest, were sold at a discount sufficient to make them yield 4.01 percent.

Two other issues of \$1.5 million each were subsequently sold: One in 1943, to cover final construction costs, and one in 1946, in connection with a refinancing to take advantage of a lower interest rate. In 1948 the financing of the original turnpike was merged with that of the eastern extension which had earlier been authorized by the legislature. Bonds were issued in that year, in part to redeem the outstanding indebtedness on the original section and partly to finance the 101-mile extension. These bonds were sold to private interests at a net interest rate of 3.08 percent.

This brief tracing of the financing of the Pennsylvania Turnpike is of interest to show the change in public attitude toward toll highway revenue bonds during the period 1937-48. In 1937, with recollections of the long economic depression fresh in the minds of investors, and with road systems then not generally regarded as seriously inadequate, the Pennsylvania Turnpike was not expected to be fully self-liquidating. Despite its favorable position geographically and topographically, and the fact that only 60 percent of the cost needed to be liquidated through tolls, the Reconstruction Finance Corporation, in accepting the bonds, required a net interest rate of 4.01 percent. Net interest rate or cost is the actual rate of return on the investment in the bonds, taking into consideration the discount or premium at which the bonds were sold.

Opened in October 1940, the turnpike had only 15 months of operation before wartime restrictions curtailed its traffic and forced it to operate at a loss during the war years. But with the return to peace and the advent of unprecedented economic prosperity, traffic volumes increased everywhere, and the turnpike received more than its proportionate share of the general growth.

Gradually the obsolescence of other routes became increasingly apparent, and the speed, comfort, and convenience available over long distances on this road of modern design standards became more widely known. Increasing toll revenues not only assured the liquidation of the loan on the original section, but also showed prospects of being sufficient to have liquidated the entire cost of the facility including the amount of the PWA grant. By 1948 there was wide public acceptance of this first modern toll road. Far more optimistic views of the economic future existed than prevailed in 1938. Bonds offered by the Pennsylvania Turnpike Commission in 1948 were readily sold, and at an interest rate of but three-fourths of the rate found necessary 10 years earlier. By the end of 1954 the original 159-mile section had been extended to the Ohio border on the west and to the Delaware River on the east, a total of 360 miles. A summary of some of the features of this and the five other major toll roads in operation at the end of 1953 is shown in table 1.

TABLE 1.—Operations of 6 major toll roads, 1953

	Colorado Turnpike	Maine Turnpike	New Hampshire Turnpike	New Jersey Turnpike	Oklahoma Turnpike ¹	Pennsylvania Turnpike ²
Operating revenues:						
Tolls.....	\$431,576	\$1,604,820	\$585,410	\$19,192,647	\$1,339,877	\$20,932,161
Rentals and concessions.....		40,629		1,853,880	45,569	1,287,954
Investment income.....	8,338			396,948		35,271
Highway department funds.....	83,915					
Other.....				67,154		154,835
Total.....	523,829	1,645,449	585,410	21,510,629	1,385,446	22,410,221
Operating expenses:						
Fare collection.....	52,150	139,461	64,393	825,802	96,314	1,065,385
Maintenance.....	18,662	122,965	48,504	1,258,365	136,424	4,733,342
Traffic control.....		3,066	51,074	543,195	54,643	667,334
Administration and miscellaneous.....	13,103	74,276	19,555	630,832	46,445	757,185
Total.....	83,915	339,768	183,526	3,258,194	333,826	7,223,246
Net operating revenue.....	439,914	1,305,681	401,884	18,252,435	1,051,620	15,186,975
Operating ratio.....	6.2	4.8	3.2	6.6	4.2	3.1
Cost of collection per dollar of tolls.....cents	12.1	8.7	11.0	4.3	7.2	5.1
1953 traffic:⁴						
Automobiles.....	1,940,612	2,162,578	2,699,627	19,434,968	1,102,560	9,246,453
Trucks.....	51,018	222,194	248,392	2,153,487	89,439	2,289,543
Buses.....	(⁵)	4,959	3,990	416,623	8,393	62,076
Total.....	1,991,630	2,389,731	2,951,979	22,005,078	1,200,392	11,598,072
Percentage distribution, 1953 traffic:						
Automobiles.....	97.4	90.5	91.5	88.3	91.8	79.7
Trucks.....	2.6	9.3	8.4	9.8	7.5	19.8
Buses.....	(⁵)	.2	.1	1.9	.7	.5
Total.....	100.0	100.0	100.0	100.0	100.0	100.0
Percentage distribution, 1953 toll revenues:						
Automobiles.....	94.4	83.8	80.7	78.0	82.9	42.2
Trucks.....	5.6	15.7	19.1	19.6	15.4	56.8
Buses.....	(⁵)	.5	.2	2.4	1.7	1.0
Total.....	100.0	100.0	100.0	100.0	100.0	100.0
Average trip fee per vehicle:						
Automobiles.....	\$0.21	\$0.62	\$0.17	\$0.77	\$1.01	\$0.96
Trucks.....	.47	1.13	.45	1.75	2.31	5.19
Buses.....	(⁵)	1.62	.29	1.11	2.71	3.37
Cost of toll collection per vehicle.....cents	2.6	5.8	2.2	3.8	8.0	9.2
Length of project (miles).....	17.3	47.2	14.7	117.6	88.0	327.2
Number of toll collection points.....	1	6	1	17	6	24

¹ Opened to traffic May 16, 1953.

² For year ending Nov. 30, 1953.

³ Includes \$2,332,080 replacement reserves.

⁴ Number of vehicles.

⁵ Not segregated.

Maine Turnpike

The second major toll road of modern times was the Maine Turnpike, the first section of which was opened to traffic in December 1947. The State legislature in 1941 authorized the construction of a toll road from Kittery to Fort Kent, a distance of about 400 miles, but because of wartime restrictions and uncertainty as to financial feasibility no action was taken until 1945, when it was concluded that the section between Kittery and South Portland was feasible.

Bonds amounting to \$15 million were sold in 1946, at a net interest rate of 2.64 percent, to cover the estimated construction cost. Caught in a period of rising prices; however, the costs exceeded the estimates by a considerable amount and additional issues, one of \$5 million and a second of \$600,000, were sold to provide funds to complete the section.

When the road was opened, traffic volumes exceeded somewhat those estimated, but revenues at the toll rates originally scheduled proved to be inadequate to meet the higher costs. Eventually the tolls for passenger cars for the 47-mile trip were raised from 50 cents to 60 and later to 75 cents. Interestingly, the increase in the toll rates had no apparent effect on rate of traffic growth. Revenues have been ample to provide for all operating costs, necessary reserves, and interest charges. By the end of 1953, \$806,000 of the \$20,600,000 bond issues had been retired, an amount considerably less, however, than that provided by the sinking-fund schedule.

Nevertheless, prospects seemed to justify undertaking a 63-mile extension. The outstanding obligations of the original section were refinanced and combined with the financing of the second section. The bonds of the new issue sold at a net interest rate of 4.17 percent. Possibly significant in considering the prospects for future traffic on the original section is the fact that traffic volumes on U. S. 1 have already regained the level at which they stood at the time the turnpike was opened. It is reasonable to expect that as traffic in the area increases an increasing proportion of the new traffic will be attracted to the turnpike.

The Maine Turnpike is unique in several respects. It was the first modern turnpike to be financed without Federal assistance, and the first to be financed wholly with bonds secured only by the future earnings of the facility. As in the case of the Pennsylvania Turnpike, it possesses certain special features, although they are quite different from those that take the Pennsylvania Turnpike out of the "average" category.

The Maine Turnpike parallels U. S. 1, at a distance several miles inland. Both routes traverse and lead into areas of great attraction to summer vacationists. Consequently, turnpike traffic is predominantly a summer traffic, and is largely composed of vehicles carrying people who, because they are vacationing, were expected by many to be more willing to pay toll than those who drive for business or similar purposes.

Studies conducted by the Bureau of Public Roads in cooperation with the Maine Turnpike Commission and the Maine State Highway Commission reveal that drivers on vacation trips do use the turnpike in greater proportion than do those on business or similar trips. The studies also show, however, that drivers on long trips use the turnpike in greater proportion than those on shorter trips and that the proportion of those using it increases as the frequency of trips decreases.

Since vacation trips are usually long and infrequent, it is not possible to determine whether it is the purpose, the length, or the frequency of the trip that influences the driver most as to whether he will or will not use the toll road. Studies on other roads, however, lead to the belief that the length is probably a more important factor in the decision than the purpose. In any event, the fact that the Maine Turnpike is used to such a great extent for summer recreational

travel is a reason for the exercise of considerable caution in applying its experience to routes in other areas.

One element that works to the disadvantage of the Maine Turnpike is that substantially all of the population of the area is to the east along U. S. 1, so local travelers must always travel added distance if they wish to use the turnpike in preference to the more congested U. S. 1.

Both the turnpike and U. S. 1 lie in relatively flat country and neither route has appreciable advantage over the other with respect to gradient or length. The principal disadvantage of U. S. 1 is that its width is inadequate for peak volumes and it traverses a populous area and passes through several towns and villages.

New Hampshire Turnpike

The next toll road to be opened was the New Hampshire Turnpike, in 1950. This, too, has special features that make it important to use caution in translating its experience to other roads.

This road, but 15 miles in length, crosses the edge of the State and connects directly with the Maine Turnpike at one end and with a free express highway in Massachusetts at the other. Figuratively, it bridges the State, for its traffic includes relatively few New Hampshire vehicles or vehicles bound for points in the State.

After repeated unsuccessful attempts to obtain an increase in the gas tax to finance improvements on the winding and narrow U. S. 1, authorization was obtained from the New Hampshire Legislature for the construction of a toll road. This authorization differed from those of the two toll roads previously discussed in that it pledged the faith and credit of the State to the retirement of the bonds, and authorized the State highway commission, rather than a separate toll authority, to construct and operate the facility.

It has but a single toll-collection point. Its bonds sold at a net interest rate of 1.58 percent. Its successful operation has led to a decision to build two more toll routes in New Hampshire.

New Jersey Turnpike

The New Jersey Turnpike, successive sections of which were opened between November 1951 and January 1952, became the fourth of the major modern toll roads. This is probably the best known of the turnpikes—at least it was used by more vehicles (22 million) in 1953 than all the other 5 major turnpikes combined. Its traffic attraction has been the most striking, with the volume in 1953 reaching that estimated by the consultants for 1975, and with 1953 toll revenues more than double the amount estimated for that year.

The route is in a sense a trans-State "bridge," with much traffic using it en route between New York or New England and points to the south and west. Possibly recognition of the importance of this trans-State traffic and the feeling that it should pay its own way was a factor in the decision to construct this route as a toll facility.

Heavy through traffic with out-of-State registrations is prominent on the turnpike, especially on the more lightly traveled southern end. Significantly, however, use of the northern end, where there is more local traffic, is increasing faster than use of the southern end, so that New Jersey drivers are evidently bearing an increasing share of the cost.

While the turnpike has solved the traffic problem in New Jersey for trans-State drivers, at least for those willing to pay the 1½-cents-per-mile toll, it has done little for the average New Jersey driver. Traffic even on parallel routes now exceeds the volumes carried at the time the turnpike was opened, although were it not for the turnpike the increases would certainly have been greater. It is estimated that vehicle mileage on the turnpike was less than 6 percent of the total vehicle mileage in the State in 1953.

Aside from its striking traffic volume and revenue, the New Jersey Turnpike has other unique features. It was financed by revenue bonds, not sold through competitive bidding, but by negotiation with a group of insurance companies. A feature of the agreement was that funds were to be made available as needed, on a "forward commitment" basis. The original issue amounted to \$220 million and carried an interest rate of 3¼ percent, which applied only to the funds actually taken. The agreement also provided for interest to be paid at the rate of one-half of 1 percent on the amount not taken.

With the original section completed and its attraction to traffic known, additional sections are under construction or proposed and are being financed also by revenue bonds but sold through competitive bidding. Connections with the Holland Tunnel and the Pennsylvania Turnpike will soon be completed and will produce additional traffic, for which provision by widening the original section is being made.

Denver-Boulder Turnpike

In January 1952 the Denver-Boulder Turnpike in Colorado became the fifth of the modern toll roads. It, too, had its unique features. Studies indicated that toll revenues would not be sufficient to operate this road and amortize its estimated \$5.3 million cost. A plan was devised that authorized the State highway department to construct the road with the proceeds of revenue bonds, and further provided that up to 30 percent of the interest and principal in any year, and up to 30 percent of an amount necessary to create an adequate reserve, might be paid from regular highway funds. Total principal payments by the State could not exceed 30 percent of \$5.3 million, the original estimated cost. Costs of maintenance and operation were to be paid from State funds.

Subsequently, the cost estimate was revised to \$6.3 million. With the combination of prospective toll revenues and the guaranty of part of the costs of amortization, bonds in that amount sold at a net interest cost of 2.97 percent. Since the opening of the turnpike, costs of operation have been borne by highway funds, but the revenues from tolls have been more than adequate to meet the requirements for debt service and creation of a reserve, and it has not been necessary to call on the highway funds for that purpose.

Turner Turnpike

The year 1953 saw the opening of the Turner Turnpike in Oklahoma, on the route connecting Tulsa and Oklahoma City. The toll section includes 88 miles of the 106-mile distance between the cities. The State highway department constructed the connections to the cities at each end, without charge to the toll section.

This road probably has fewer unusual features of operation or environment than any of its predecessors, and more nearly represents

operation under "normal" or "average" conditions. It is in an area of about average traffic volumes. Other conditions, such as purposes of trips, amount of truck traffic, terrain, population density, and similar factors, that might be thought to influence the use of the earlier toll roads, are not unusual here.

The turnpike has not been in operation long enough to give conclusive evidence as to its financial prospects, but early results show that its net operating revenue is very close to that estimated by the consultants prior to its construction. In 1954, although operating costs exceeded the estimates, traffic volumes also were higher than predicted, and the net operating revenue was within 3.5 percent of the estimate for that year.

The first \$31 million of bonds for the original section were sold at a net interest cost of 3.4 percent, and an additional \$7 million were sold at a net interest cost of 3.84 percent. In December 1954 a syndicate agreed to purchase an issue of \$68 million for extension of the original section from Tulsa to the State line near Joplin, Mo., at an interest rate of 3.81 percent. It declined, however, to bid on bonds to finance a proposed extension of the turnpike system across the State to the north and south through Oklahoma City on the basis that the bond market would not then absorb further turnpike issues, and that further financing, while believed to be feasible, would "have to take time."

This turnpike, because of the "average" conditions surrounding it, will be observed with much interest by highway and investment interests.

Other toll roads

Not included in table 1 are a number of toll roads opened in part or in whole in 1954, but too late for their experience to be significant. These roads, and those already discussed, are listed in table 2, which shows the status of all arterial toll roads as of January 1, 1955.

TABLE 2.—Status of arterial toll roads as of Jan. 1, 1955

Name of road or location ¹	Year built or estimated completion date	Mileage				Actual or estimated cost (1,000 dollars) ²
		Completed	Under construction	Authorized ³	Proposed ³		Total
Colorado: Denver-Boulder Turnpike ⁴	1952	17.3				6,237
Connecticut: Greenwich-Killingly Expressway ⁴	1957		129.0			398,000
Delaware: Maryland line-Delaware Memorial Bridge					16.0	16,000
Florida:						
Sunshine State Parkway (Hollywood-Fort Pierce)				110.0		78,000
Fort Pierce-Jacksonville					238.0	150,000
Cross-State spur to Tampa					128.0	80,000
Subtotal, Florida				110.0	366.0	303,000
Georgia: Cartersville-Valdosta				89.0		825,000
Illinois:						
Chicago-Rockford-Beloit					88.4	141,602
Chicago Belt Line (Hammond, Ind.-Wisconsin line)					80.2	208,944
Maywood-Aurora					24.7	39,454
Subtotal, Illinois					193.3	390,000
Indiana:						
Turnpike (Ohio line-Illinois line)	1956		156.0			280,000
Gary area-Indianapolis area				131.0		178,000
Vincennes-Cincinnati area					160.0	200,000
Indianapolis-Cincinnati					110.0	100,000
Subtotal, Indiana			156.0	131.0	697.0	758,000
Iowa: Davenport-Council Bluffs					897.7	180,000
Kansas:						
Turnpike (Kansas City via Topeka and Wichita to Oklahoma line)	1957		226.0			160,000
Turnpike extensions:						
Bonner Springs-Missouri line					66.0	33,220
Wichita-Hays					155.0	79,140
Subtotal, Kansas			226.0		211.0	272,360
Kentucky:						
Turnpike (Louisville-Eltzabethtown)	1955		40.0			38,500
Louisville-Cincinnati			40.0		100.0	80,000
Subtotal, Kentucky			40.0		100.0	118,500

See footnotes at end of table, p. 14.

TABLE 2.—Status of arterial toll roads as of Jan. 1, 1955—Continued

Name of road or location ¹	Year built or estimated completion date	Mileage				Actual or estimated cost (1,000 dollars) ⁴	
		Completed	Under construction	Authorized ²	Proposed ³		
Louisiana: Lafayette-Lutcher.....				86.0		86.0	100,000
Maine:							
Turnpike (Portsmouth-Portland).....	1947	47.2				47.2	20,600
Portland-Augusta extension.....	1955		66.0			66.0	55,000
Augusta-Port Kent extension.....				279.0		279.0	195,000
Subtotal, Maine.....		47.2	66.0	279.0		392.2	270,600
Maryland: Northeastern Expressway (Baltimore-Elkton area).....					48.0	48.0	29,526
Massachusetts: Turnpike (New York line-Boston area).....	1956		123.0			123.0	239,000
Michigan:							
Rockwood-Saginaw.....				114.6		114.6	187,000
Ypsilanti-Gary area.....				176.0		176.0	215,000
Subtotal, Michigan.....				290.6		290.6	402,000
Nebraska: Omaha-Lincoln.....					65.0	65.0	40,000
New Hampshire:							
Turnpike (Seabrook-Portsmouth).....	1950	14.7				14.7	6,770
Portsmouth-Rochester extension (Spaulding Turnpike).....	1957		22.8			22.8	14,300
Central Turnpike (Everett).....	1957		37.6			37.6	22,400
Subtotal, New Hampshire.....		14.7	60.4			75.1	43,470
New Jersey:							
Garden State Parkway ⁴	1954	90.0				90.0	80,000
Extension to New York Thruway.....				8.0		8.0	25,000
Turnpike (Delaware River to George Washington Bridge interchange).....	1952	117.6				117.6	284,932
Turnpike extensions:							
Newark Airport interchange-Holland Tunnel.....	1955		8.1			8.1	120,048
Bordentown interchange-Pennsylvania Turnpike extension.....	1956		6.0			6.0	27,200
Newark-Columbia.....				59.0		59.0	300,000
Subtotal, New Jersey.....		207.6	14.1	67.0		288.7	837,200
New York:							
New York Thruway system:							
Buffalo-New York City section.....	1954	396.0	31.0			427.0	675,428
Niagara section.....			20.0			20.0	
Erie section.....			70.0			70.0	321,938
New England section.....			18.0			18.0	

12 PROGRESS AND FEASIBILITY OF TOLL ROADS

Berkshire section.....				20.0		20.0	
Garden State Parkway connection.....				2.0		2.0	62,332
New Jersey Turnpike connection.....				5.0		5.0	
Albany-Rouses Point section.....					100.0	100.0	160,000
Binghamton-Clayton section.....					185.0	185.0	248,000
Harriman-Binghamton section.....					110.0	110.0	110,000
Long Island Expressway (New York City-Riverhead).....				64.0		64.0	80,000
Subtotal, New York.....		396.0	159.0	31.0	458.0	1,081.0	1,657,698
North Carolina: Gastonia-Mount Airy Turnpike.....				125.0		125.0	200,000
Ohio:							
Turnpike (Pennsylvania line-Indiana line).....	1955	21.4	220.0			241.4	326,000
Cincinnati-Conneaut.....				300.0		300.0	400,000
Columbus-Toledo spur.....				100.0		100.0	125,000
Subtotal, Ohio.....		21.4	220.0	400.0		641.4	851,000
Oklahoma:							
Turner Turnpike (Oklahoma City-Tulsa).....	1953	88.0				88.0	38,585
Turnpike extensions:							
Tulsa-Missouri line.....	1957		88.5			88.5	68,000
Oklahoma City-Kansas line.....				97.6		97.6	61,380
Oklahoma City-Texas line.....				127.6		127.6	94,380
Subtotal, Oklahoma.....		88.0	88.5	225.2		401.7	222,345
Pennsylvania:							
Turnpike (Irwin-Carlisle).....	1940	158.9				158.9	77,164
Eastern extension (Carlisle-Valley Forge).....	1950	100.9				100.9	87,000
Western extension (Irwin-Ohio line).....	1951	67.4				67.4	77,500
Delaware River extension (Valley Forge-Delaware River).....	1954	32.3				32.3	65,000
Northeastern extension (Philadelphia-Scranton).....	1956		110.0			110.0	233,000
Northeastern extension (Scranton-Sayre).....				40.0		40.0	40,000
Northeastern extension (lateral spurs).....				100.0		100.0	170,000
Gettysburg extension (to Maryland line).....				33.0		33.0	33,000
Northwestern extension (New York line-Ohio line via Erie with connection to Pittsburgh).....				150.0		150.0	250,000
Subtotal, Pennsylvania.....		359.5	110.0	325.0		794.5	1,058,664
Rhode Island: Connecticut line-Massachusetts line.....				40.0		40.0	35,000
Texas:							
Dallas-Fort Worth Turnpike.....				30.5		30.5	58,500
Dallas-Fort Worth area-San Antonio.....				250.0		250.0	139,000
Gainesville-Corpus Christi via Houston.....				400.0		400.0	200,000
Subtotal, Texas.....				680.5		680.5	397,500

See footnotes at end of table, p. 14.

PROGRESS AND FEASIBILITY OF TOLL ROADS

TABLE 2.—Status of arterial toll roads as of Jan. 1, 1955—Continued

Name of road or location ¹	Year built or estimated completion date	Mileage				Actual or estimated cost (1,000 dollars) ²
		Completed	Under construction	Authorized ³	Proposed ⁴	
Virginia:						
Richmond-Petersburg.....				35.0		57,000
West Virginia line-North Carolina line.....				75.0		75,000
Subtotal, Virginia.....				111.0		132,000
Washington: Tacoma-Everett.....				65.0		175,000
West Virginia:	1954					
Turnpike (Charleston-Princeton).....		87.6				133,000
Turnpike extensions:						
Charleston to Pennsylvania and Ohio lines via Fairplain.....					225.0	338,000
Princeton-Virginia line.....					6.0	9,000
Subtotal, West Virginia.....		87.6			231.0	480,000
Total mileage.....		1,239.3	1,352.0	3,314.3	2,253.0	8,188.6
Total actual or estimated cost.....		\$1,552,296	\$2,303,386	\$3,758,592	\$2,242,886	\$9,857,100

¹ Omitted from this tabulation are the Jacksonville, Fla., toll expressway system, the Calumet Skyway in Chicago, Ill., and the proposed Loveland Pass Tunnel in Colorado which are not classified as toll roads.

² Legislation has been enacted authorizing construction of these toll roads or enabling projects to be constructed if found feasible. Financing arrangements have not been completed.

³ Includes toll roads authorized or recommended for study as to feasibility by State governors, highway departments, turnpike officials, or legislative committees. As of current date, plans and locations have not been firmly established. Cost and mileage data are therefore only approximated. Omitted are (a) projects discussed informally, (b) those proposed at a previous time, but apparently not now receiving serious consideration, (c) projects studied and found presently infeasible, including those for which enabling legislation has been introduced but failed of enactment.

⁴ "Actual" costs refer in most instances to proceeds of bond issues and hence include interest during construction.

⁵ The State is required to pay maintenance and collection costs in addition to debt service to the extent that revenues from toll receipts are inadequate to meet the full debt requirements.

⁶ Section of the parkway south of Lakewood on which trucks are permitted. Turnpike Commission and the New Jersey Turnpike Authority of the Pennsylvania Delaware linking these toll roads.

⁷ Includes \$29,350,000 Federal grant from the Public Works Administration. Cost of completed mileage includes 31 miles of New York Thruway. Cost of mileage under construction includes 21.4 miles of the Ohio Turnpike opened to traffic December 1954. In neither case is the segregation available.

TABLE 3.—Status of toll parkways ¹ as of Jan. 1, 1955

Name of road or location	Year built or estimated completion date	Miles	Actual or estimated cost (1,000 dollars) ²
Connecticut: ³			
Merritt Parkway.....	1940	37.5	420,592
Wilbur Cross Parkway.....	1940	29.5	17,500
Subtotal, Connecticut.....		67.0	28,092
New Jersey: Garden State Parkway ⁴	1955	75.0	250,000
New York:			
Westchester County parkways: ⁵			
Saw Mill River Parkway (toll portion).....	1926	11.1	3,500
Hutchinson River Parkway (toll portion).....	1927	11.2	4,600
Cross County Parkway.....	1940	4.0	1,800
Southern State Parkway system ⁶	1955	23.0	40,000
Subtotal, New York.....		49.3	19,900
Grand total.....		191.3	337,992

¹ These facilities permit free access between toll gates and, in general, heavy trucks are denied use of the parkways. Except as noted, all are in operation.

² "Actual" costs refer in most instances to proceeds of bond issues and hence include interest during construction and other initial financing costs.

³ The Connecticut and Westchester County (N. Y.) parkways were not built as self-liquidating limited-access toll roads.

⁴ Includes Federal grant of approximately \$400,000 from Public Works Administration.

⁵ Section of the Parkway north of Lakewood on which trucks are prohibited. 65 miles in operation, 10 miles scheduled to be opened in 1955.

⁶ Includes 5.5 miles under construction. 1953 legislature authorized a 10-cent toll on the existing Southern State Parkway to help finance a \$40 million parkway construction and improvement program. Toll collections began in July 1954.

TABLE 4.—Status of resort toll roads ¹ as of Jan. 1, 1955

Name of road or location	Year built or estimated completion date	Miles	Cost (in thousands of dollars)
Florida: Buccaneer Trail.....	1950	17.5	4,600
Georgia: Brunswick-St. Simon Causeway.....	1924	11.1	650
New York:			
Long Island Parkways:			
Meadowbrook and Loop Causeways.....	1934	8.3	5,000
Wantagh Causeway.....	1934	5.1	2,000
Captree Parkway.....	1954	4.2	7,300
Subtotal, New York.....		17.6	14,300
Interstate: Nags Head, N. C.-Virginia Beach, Va. ²		54.0	3,500
Grand total.....		100.2	23,050

¹ These facilities are principally publicly owned resort or seasonal roads, not serving through traffic.

² This road has not been financed.

West Virginia Turnpike

The West Virginia Turnpike was completed late in 1954. Originally proposed to cross the State from north to south through Charleston, the 88-mile section south from Charleston to Princeton, near the Virginia border, was deemed feasible of self-liquidation. Revenue bonds in the amount of \$96 million were sold in April 1952, at a net interest rate of 3.95 percent. Subsequently, to cover unanticipated construction costs, an additional \$37 million issue was sold at a net interest cost of 4.25 percent. A portion of this section was opened in September 1954 and the remainder in the following month. The toll route saves considerable distance and eliminates much tortuous

mountain alignment, and so was expected to be especially attractive to truck traffic, the estimates anticipating that commercial vehicles would account for 40 percent of the total traffic.

Among the toll roads not yet in full operation are two that deserve special mention: the New York Thruway, and the Garden State Parkway in New Jersey. Both were financed in their early stages by bonds backed by the faith and credit of the respective States. Subsequently, additional funds were obtained in each case through the sale of revenue bonds.

Garden State Parkway

The Garden State Parkway, running 165 miles, generally along the New Jersey coast, from Patterson at the north to Cape May at the south, was begun in 1945. By 1951, only 22 miles had been completed through the use of current revenues. It became apparent that credit financing would be required to complete the route in a reasonable time, and in 1952 the New Jersey Legislature established an authority within the State highway department to construct and operate the parkway. The voters subsequently authorized the issuance of \$285 million in bonds, backed by the faith and credit of the State. This issue was sold in 2 installments, \$150 million at a net interest cost of 2.997 percent and \$135 million at a net interest cost of 2.77 percent. Subsequently, the legislature gave authority to sell bonds backed only by the revenues of the parkway. In November 1954, \$20 million of such bonds were sold at a net interest cost of 3.24 percent to provide for the extension and widening of certain sections.

Automobiles and buses may use the entire length, but trucks are prohibited from using approximately the northern two-fifths. For this reason, part of the parkway is shown in table 2 and part in table 3.

An unusual feature of this toll road is the manner of collecting tolls. Most arterial toll roads are of the "closed" type. A driver receives a card as he enters and surrenders it when leaving, and the toll paid is based on the distance traveled on the turnpike. On the Garden State Parkway, tolls of a fixed amount are collected at each of a series of toll gates, or "barriers," through which all traffic passes. Thus drivers who both enter and leave the parkway at interchanges between adjacent barriers pay no toll. Drivers passing a barrier pay the fixed fee regardless of where they enter, and drivers traversing a considerable length of the parkway pay tolls at each of a series of barriers.

New York Thruway

The New York Thruway developed as a toll road after experience much like that of the Garden State Parkway. Started as a free expressway, intended eventually to connect Buffalo and New York City, slow progress soon showed that it could not be completed in reasonable time without credit financing. In 1950 the Thruway Authority was created by the New York Legislature and, in an election in November 1951, approval of an issuance of \$500 million in bonds backed by the faith and credit of the State was obtained. Subsequently, the legislature authorized the issuance of additional bonds, backed by revenues only, in the amount of \$350 million.

With this financing assured, the thruway was constructed rapidly and the major portion of its length, from Buffalo to the crossing of the Hudson River near Nyack, is open. On this portion tolls are collected in the customary manner of a "closed" system, except that holders of \$20 annual permits for automobiles have unlimited use of the facility. A barrier toll gate at which 50 cents will be charged will be placed on the approach to the Hudson River Bridge, and tolls will be collected at barriers between the bridge and New York City. The total passenger-car toll from Buffalo to New York City is expected to be \$5.60 for the 427-mile trip.

As these completed or nearly completed roads have come into operation, others are under construction, and 335 miles are scheduled to be opened in 1955.

In addition to the arterial toll roads listed in table 2, there are a number of parkways and other routes on which tolls are collected at barriers, and on which the revenues from the tolls are not intended to liquidate the cost of the facility but merely to provide additional needed revenue. These routes are listed in tables 3 and 4. Toll roads in all categories, as of January 1, 1955, are shown in figure 1.

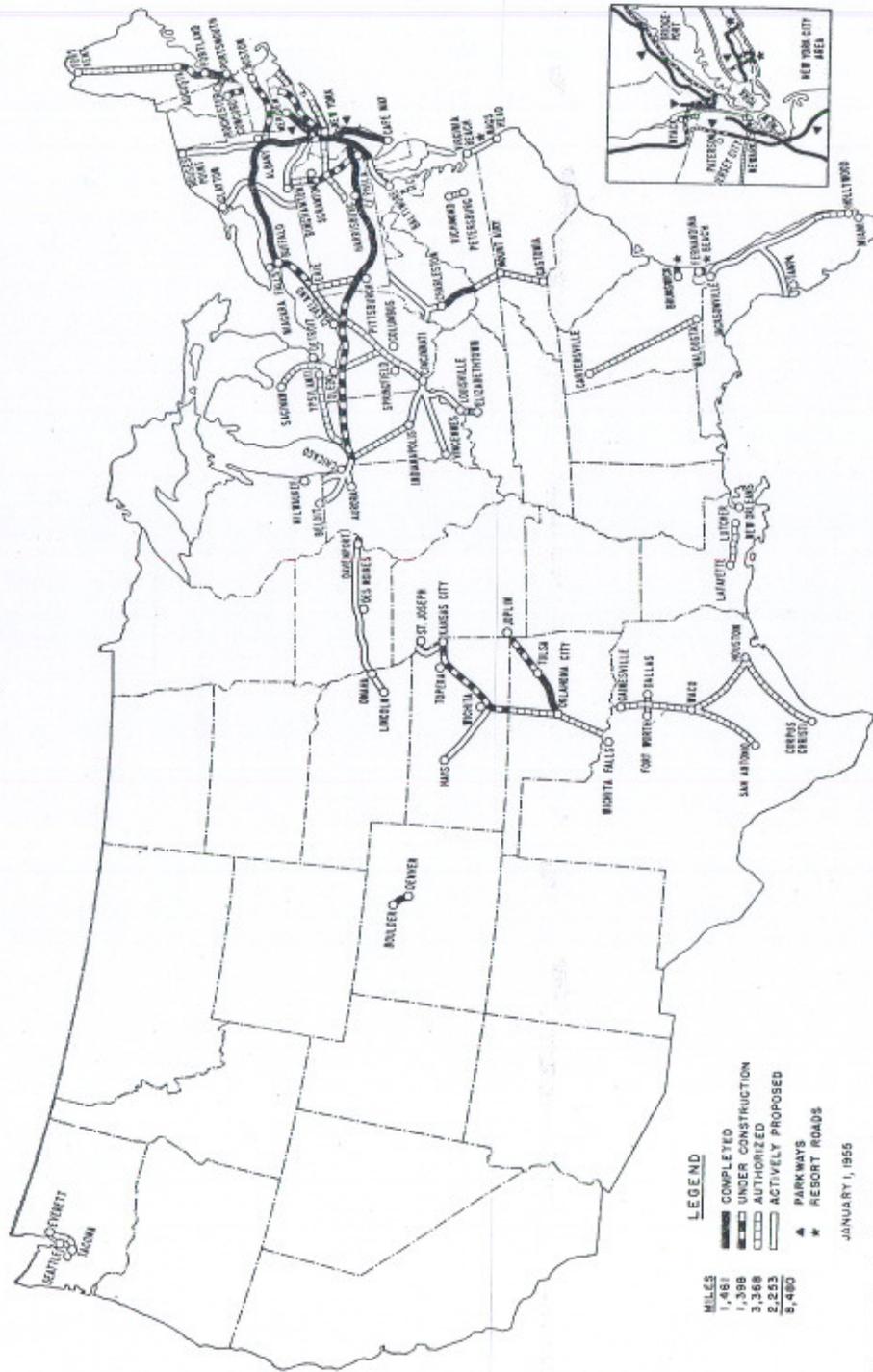


FIGURE 1.—Arterial toll roads, toll parkways, and resort toll roads in operation, under construction, authorized, and actively proposed, as of January 1, 1935.

Past experience as a guide

Because of variations in the methods of financing the present toll roads and the many special conditions that surround their operation, it is apparent that prospects for further toll financing cannot be determined simply by projecting past experience. Each proposal requires a detailed study of its financial feasibility and of the most effective method of collection of the essential revenue.

There has emerged from the experience to date, however, a rather standardized pattern of study of feasibility and a good knowledge of many of the factors essential in estimating feasibility. Estimates of the proportion of traffic that may be expected to be attracted to roads of modern design, the amount of revenue that may be expected from concessions for the sale of gasoline and food, and factors of safety that investment bankers regard as necessary before subscribing to proposed bond issues may now be made on the basis of actual experience on a number of toll roads operating under a variety of conditions.

One of the obvious conclusions from the experience of toll-road operation and studies of feasibility and cost that have been made is that the situation is never static. Conclusions reached today may have to be altered within a year as new developments appear. It is almost axiomatic, however, that with the steady increase in traffic volumes everywhere in the country and with traffic needs increasing so much faster than the facilities provided for its movement, financing through revenue bonds will become increasingly attractive unless provision of public funds is substantially increased. It appears, however, that even though the general level of attractiveness of revenue-bond financing will vary with the economic situation and with the amount of construction with public funds, the order of feasibility of individual routes relative to one another does not change materially.

As indication of the absence of change in relative feasibility of different routes, it is of interest to compare the location of toll roads now operating or under construction with the sections found to be the most likely to be self-liquidating in the 1938 study of the Bureau of Public Roads. The two maps in figure 2 show this comparison. The upper map shows the arterial toll roads now in operation or under construction. It includes a number of roads that were not considered in the 1938 study because they are not on one of the six routes to which that study was limited. The lower map shows the 2,977 miles of highway portrayed in plate 15 of the report *Toll Roads and Free Roads* (p. 28) as highest in order of estimated feasibility. A number of these routes probably will not be built as toll roads because existing or planned free routes will meet traffic needs.

The similarity of these maps is striking. The resemblance would be still closer, however, if from the upper map were removed the toll roads that do not lie along the routes selected for the 1938 study, and if from the lower map were eliminated the routes on the west coast, most of which probably will not be built as toll roads because of the adequacy of existing or planned free roads.

The conclusion is obvious that the greatly increased traffic pressures, caused by the tremendous upsurge in traffic and the lag in

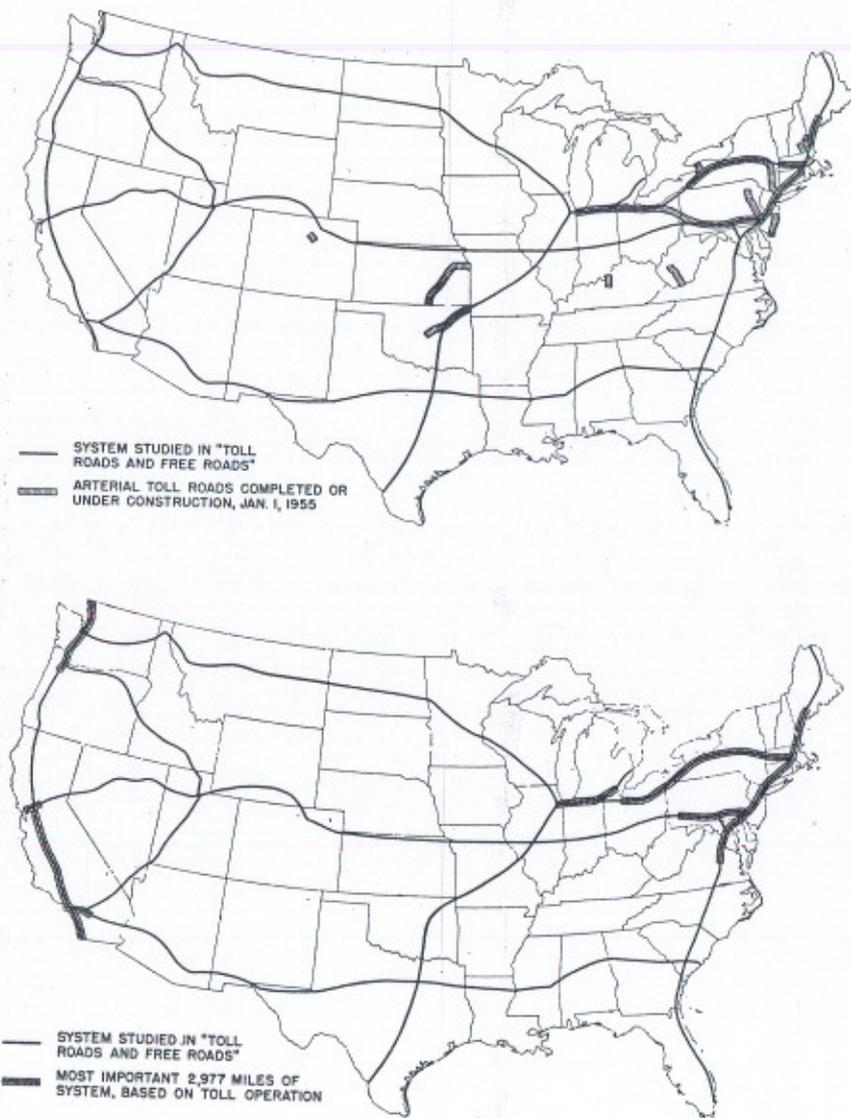


FIGURE 2.—Relation of the arterial system studied in Toll Roads and Free Roads and toll roads completed or under construction as of January 1, 1955.

meeting the increased needs, coupled with the more optimistic current view of the economic future, have raised the whole level of financial feasibility of toll roads, but have had but little effect on the relative order of feasibility of particular routes.

Toll roads authorized or proposed

In addition to the mileage of toll roads already in operation or under construction many more miles have been authorized or proposed. Table 2 shows that over 3,300 miles of arterial toll roads have been authorized and another 2,250 proposed, making in total—operating, under construction, authorized, or proposed—nearly 8,200 miles of such roads.

Some of the mileage authorized or proposed undoubtedly will be found feasible and will be built. Certain mileage authorized has already been found not to be feasible at this time, however, and has been deferred at least for the present. And some routes have been authorized with the understanding that sections will be financed as they may be found feasible, without expectation that the entire length will be constructed in the near future.

On the other hand, at the close of 1954, authority for financing highways through revenue bonds existed in but 29 States. Undoubtedly projects in some States in which such authority does not exist would be financially feasible and might be built as toll roads should the policy be changed in those States.

Thus the projected toll roads included in the last two categories in table 2, approximately 5,550 miles in length, must be regarded merely as those that might be built should conditions of the future justify. It should not be assumed that there is definite prospect of toll roads on the particular locations listed or in the total amount shown.

FEASIBILITY OF ADDITIONAL TOLL ROADS

Study of the feasibility of toll roads made at the direction of Congress included analyses of the feasibility of constructing roads through revenue-bond financing supplemented by such other revenues as normally accrue in toll-road operations. The estimates of feasibility were made for routes in all States, irrespective of whether legislation authorized toll financing of highways. The investigation excluded routes on which improvement now existing or programed was expected to meet the traffic demands of the future. Thus the mileage estimated to be feasible as toll roads is in addition to mileage, either toll or free, that now meets traffic requirements or on which definitely programed improvements will make it satisfactory. The mileage estimated to be feasible of toll financing is in no way related to the mileage of toll roads now authorized or proposed in the various States.

Basis of estimates

A report on the feasibility of toll roads throughout the United States, prepared within the time and cost limitation of this study, must necessarily be in most general terms. Accurate determination of the feasibility of a single project requires intensive studies of construction cost and of traffic, taking into consideration the origin and destination of trips, which generally cannot be completed in less than about a year. Such studies have been made for some individual projects but the

mileage of these is very small indeed when viewed in the light of a nationwide highway program.

However, information on the costs of toll roads, and of free roads of comparable design, is sufficient to permit engineers in the field to make estimates of the cost of constructing the various portions of the Interstate System and of other routes as toll roads, which should be reasonably accurate on the average. Information is also available on the volumes of traffic using all the principal roads throughout the Nation as a result of continuing studies made by the State highway departments in cooperation with the Bureau of Public Roads. This traffic volume information is insufficient, in itself, to determine the traffic that would use a toll road, but it may be interpreted, in the light of the results of intensive traffic studies made before and after the construction of several of the existing turnpikes, to form a basis for reasonable estimates. Such estimates, while certainly not sufficiently accurate for use in the final appraisal of individual projects, are believed, when combined for several sections or routes, to provide a fairly reliable general measure of toll-road feasibility.

For the purposes of this study, estimates were made of construction costs and traffic volumes for all sections of the Interstate System, exclusive of sections already adequately improved and those known in 1954 to be scheduled for early improvement either as toll or free roads. Traffic was forecast for the years 1964, 1974, and 1984. General rates of traffic increases assumed were consistent with those rates used in the report, Needs of the Highway Systems, 1955-84, recently submitted to the Congress (84th Cong., 1st sess., H. Doc. No. 120).

Similar estimates were made for those routes not on the Interstate System but believed to have toll potential. All of the State highway departments cooperated fully in this undertaking by providing the basic cost and traffic data from which toll feasibility was calculated.

Estimates made by the States were carefully reviewed and compared. Revisions were made in a few instances for consistency or where indicated as proper on the basis of additional information. While these revisions were substantial in certain cases, they were not such as to make appreciable differences in the broad, overall determinations.

Basic assumptions

The costs and traffic estimates were used to determine the probable extent of toll-road feasibility. Certain basic assumptions had to be made.

First, it was assumed that the financing would be by revenue bonds, which is the method for most of the toll roads now being built. In keeping with current toll-road financing practices and experience on existing toll roads, the following values were assigned to the various items entering into the calculations:

- (a) Amount of bonds: 1.12 times construction cost.
- (b) Term of bonds: 40 years.
- (c) Rate of interest: 3.5 percent.
- (d) Toll rate, passenger cars: 1.75 cents per vehicle-mile.
- (e) Toll rate, trucks: 4.00 cents per vehicle-mile.
- (f) Revenues from concessions: 7 percent of gross receipts from tolls.
- (g) Administrative, operational, and maintenance costs, and replacement reserve: 20 percent of gross revenues.

Items (a), (b), and (c) are based on the most recent experience or practice in financing toll roads through revenue bonds. Item (d), toll rate for passenger cars, is higher than the average collection on some roads and below that on others. The average on the New Jersey Turnpike, for example, was 1.94 cents in 1953 (with proper weight given the larger volumes on the northern end where the rate for some trips was as much as 3.0 cents per mile). It is believed that 1.75 cents per mile for passenger cars and corresponding rates for trucks can be collected if necessary. Item (f) is based on the experience of existing toll roads. Item (g) is consistent with current practices in estimating feasibility. While the first three factors could be estimated from existing toll roads, the factor of replacement reserve cannot be estimated on the basis of experience to date.

For purposes of this analysis it was assumed that bonds would be sold in 1957, roads opened to traffic in 1959, and amortization started in 1960, interest from 1957 to 1960 being paid from bond receipts and accounted for in the 1.12 factor, item (a).

Feasibility ratios

Feasibility ratios were calculated by dividing the estimated net operating income for 1978 (the midyear of the period of bond amortization) by the annual cost of debt service. Net operating income was determined by deducting the amount needed for administrative, operational, and maintenance expenses and replacement reserves from total receipts from tolls and concessions. Experience in recent years shows that bonds offered to finance projects having a feasibility ratio of 1.5 or more, calculated in the manner described, would be marketable. Therefore, any section having a ratio of 1.5 or more was regarded as feasible of construction through toll financing.

As previously pointed out, these studies could not be made in such detail as to permit the determination of the feasibility of individual projects with assurance. However, since the factors used for such items as traffic diversion and generation were based on average conditions as determined from traffic studies of existing toll roads, it is believed that the national totals resulting from the study are reasonably reliable.

Mileage feasible of toll financing

The most significant finding of the study of toll feasibility is probably that, of the highways found to be feasible, all but about 200 miles lie along the lines of the Interstate System. This finding not only attests the importance of the Interstate System, but permits the consideration of toll roads to be related almost entirely to the completion of the Interstate System. Opportunity for revenue-bond financing of improvement of routes of the other systems is so rare as to be of no importance.

Calculations were made on the basis of the individual sections for which data were supplied by the States. These sections varied greatly in length, some being as short as 1 mile. The results reflect a feasibility based entirely on the traffic and cost, disregarding completely the desirability of integration and continuity.

On the assumption that each section showing a feasibility ratio of 1.5 or above is acceptable for toll financing, the total length of the Interstate System that could be thus financed would be about 6,700 miles, estimated to cost \$4,260 million. This is mileage on the system,

in addition to that now adequately improved or scheduled soon to be made adequate, either as toll roads or free roads, that might be financed through the proceeds of revenue bonds if issued in keeping with current practices. It bears no relation to the mileage of roads authorized or proposed as listed in table 2.

Some of the 6,700 miles lie in States that have not authorized toll financing and, as a matter of policy, may prefer not to finance roads in this way in the future. Other mileage lies in States in which authority to construct toll roads is limited to particular routes and in which there is no authority to construct sections on other routes that might have been found in this study to be feasible of toll financing. To the extent that these conditions prevail, the mileage that might be constructed as toll roads would be less than the 6,700-mile figure.

On the other hand, some States have provided for the pooling of revenues from separate sections of a route or from different routes so that an entire system may be financed as a unit and not as separate independent sections. In such cases earnings on a particular section or route in excess of requirements may be applied to supplement the earnings on other sections or routes that in themselves do not show a feasibility ratio sufficiently high to make them attractive investments. In such States sections now found not to be feasible might be possible of inclusion as a part of a more complete system. Pooling of revenues through interstate compacts might further increase the feasible mileage, and should a national toll authority be set up through which excess revenues from toll roads in one State could be used to augment revenues in others, a substantial increase in feasible mileage might result.

There are many factors involved, some working to increase and others to decrease the mileage that apparently would provide attractive investment opportunities if proposed for revenue-bond financing. The greatest uncertainty, however, is as to the policies of the States and the Federal Government with respect to the public funds from taxes or bond issues that will be applied to the improvement of the Interstate System. Assurance of public funds to provide reasonably early completion of the system would soon spell the end of revenue-bond financing of roads in the system. Continuation of the present inadequate allocation of funds to this system, however, can only serve to increase the mileage that would be potentially feasible as toll roads.

EFFECT OF TOLL ROADS ON THE FEDERAL-AID PROGRAM

In the Federal-Aid Road Act of 1916 (39 Stat. 355) the Congress provided (sec. 1)—

*** That all roads constructed under the provisions of this act shall be free from tolls of all kinds.

That provision was reaffirmed in section 9 of the Federal Highway Act of 1921 (42 Stat. 212), and is still in effect.

The early decision of the Congress came at a time when recollections were fresh of tolls collected on roads badly maintained or nearly impassable. Such conditions were thought to have no place in the transportation system, and it was to prevent their recurrence that Federal aid was barred from participation in toll-road construction. Now, nearly 40 years later, the resurgence of toll roads has brought

about the need to review their place in the highway systems of the country.

Acceptance of toll roads

Financing of roads through the sale of revenue bonds has developed because provision of public funds through accepted channels has lagged far behind highway needs. In this situation, revenue-bond financing has provided many miles of badly needed controlled-access highways when other means have failed. The financial success of the early examples of the modern toll road and the rapid extension of toll roads on some of our most important routes raises serious questions as to the place of the toll road in the Federal-aid systems and to its effect on the Federal-aid program.

Toll roads are most readily accepted on routes where existing congestion and delays are great and the construction of a controlled-access highway would produce substantial savings of time and increased comfort and safety of travel. Additional acceptance is found when out-of-State vehicles are prominent in the traffic.

With all highway needs so pressing, administrators in a State are reluctant to ask for general increases in taxes to build roads of principal interest to one section of the State or to drivers from other States. At the same time, drivers traversing the section of the State where a controlled-access highway is needed, particularly those from out of the State who are usually on long trips and are infrequent users of the road, are not reluctant to pay a toll for the assurance of rapid travel on a safe and uncongested highway.

Toll roads already in operation have relieved congestion for the through traffic on main routes in a number of States, and as others come into operation they also will offer facilities superior to those now existing, for drivers who wish to pay the tolls. Diversion of traffic to toll roads from existing routes reduces traffic on those routes and usually relieves the pressure for their immediate improvement. To this extent, the toll roads are distinctly beneficial to the Federal-aid program. With the steady increases in traffic, however, the need for improvement of the existing facilities in many cases soon recurs.

Two conditions inherent in toll-road operation produce a pronounced effect on the Federal-aid program:

1. A toll road cannot serve all the traffic for which some route must provide service.

2. The first responsibility of operators of a toll road is to the investors. This is not to imply that in many instances toll roads are not practicable and thoroughly satisfactory answers to traffic problems. In all cases, however, these two factors must be considered in weighing the desirability of including a toll road in the overall highway network.

Duplication of facilities

By their nature, toll roads require that interchanges providing access and egress be placed only at infrequent intervals. The cost of collecting tolls is such that toll stations are usually operated only where there is sufficient usage to make them profitable. Even in the congested section of the country with a closely spaced road network, the average distance between interchanges on existing toll roads ranges from 7 to 14 miles.

Since short trips predominate in the traffic stream, many drivers are precluded from the use of a toll road merely because their trips are not long enough to permit them to take advantage of it.

Moreover, certain drivers who might use a toll road do not do so because of the toll, or for some other reason.

As an example, studies of traffic using the Maine Turnpike and the parallel U. S. 1 show that of the drivers whose origins and destinations were such that use of the full length of the turnpike was feasible, between 75 and 80 percent used the turnpike, the percentage increasing as the total traffic on the two routes increased. In contrast, less than 15 percent of those whose trips permitted the use of only part of the turnpike took advantage of it. Of the total vehicle-mileage on the two routes, excluding the mileage within the towns along U. S. 1, the percentage on the turnpike ranged from 38 to 50 percent, again with the percentage using the turnpike increasing as the total traffic on the two routes increased. Significantly, average traffic on U. S. 1 in 1954 had regained its level of 1947, the year before the opening of the turnpike.

Thus, even though a toll road may be readily self-liquidating, it can never relieve some public agency from the responsibility of continuing to provide local service and service for through travelers who, for whatever reason, prefer not to use a toll road.

On the other hand, a properly located and designed free road can serve both the through and local traffic. As an indication of the limitation of traffic service that can be provided by toll roads, it was estimated that the Interstate System, if its inadequate sections were completed as toll roads located in keeping with current practice, would serve only two-thirds of the traffic that the system would serve if it were completed as a free system.

In the more congested areas, where traffic volumes are sufficient to require two or more roughly parallel routes, there is advantage in locating one to accommodate principally the through traffic, whether it be toll or free, and another to accommodate local or shorter-range movement.

In the more usual case, however, a single facility appropriately located and adequately designed can accommodate the traffic for many years to come. To build a toll road in such a situation might be financially feasible. And the toll road would relieve to some extent congestion that might exist on the free road that must also be maintained. Further, by this measure of traffic relief, it might be found considerably less costly for the responsible public agency to maintain the free route in condition suitable for its remaining traffic than it would be to provide and maintain a single facility for the entire traffic flow through the area. Despite whatever saving may accrue to the public agency, however, the fact remains that the two facilities must be maintained, one from public funds and one from funds from private sources; and regardless of the source of funds the total cost will in all probability be greater, and the greater cost is, of course, borne in one way or another by the public.

Effect on programing of improvements

The impact of a toll road is, of course, not confined to any particular system of roads, but because most existing and prospective toll roads lie along the general lines of the Interstate System, the effect is greatest on the planning and construction of that system and on the other Federal-aid roads closely interrelated with the Interstate System.

The Federal-aid program is affected immediately upon decision to consider the construction of a toll road. Public officials then generally hold in abeyance further activity in construction or even in planning and programing improvements along the line of the route and also on roads intersecting or closely paralleling the proposed toll road. Should improvements be made and the toll road later constructed, highway officials might be placed in the position of having wasted public funds or of entering into competition for traffic with a toll authority whose income depends on the continuance of a substantial advantage in traffic service of its facility over that of parallel free facilities.

On the other hand, to defer planning or construction of free highways may, if the projected toll road is not subsequently built, merely serve to delay for a period the active prosecution of badly needed public improvements. Many toll roads are proposed but not built, and in many instances years elapse between the first proposal and the ultimate decision. A period of 2 to 3 years between the date of formal authorization and the time that financing is assured is common. Meanwhile progress on the route in question, presumably one of the more important in the State, is at a standstill.

Up to this time, these conditions have been somewhat disconcerting, since they upset the orderly programing of improvements that the States and the Federal Government try to achieve. Probably they have not seriously delayed progress on the Interstate System, but only because the funds that have been available have been insufficient to permit marked progress. Should substantial funds for improvement of the Interstate System be available, such delays could be serious unless, of course, sufficient public funds were provided to assure reasonably prompt undertaking of needed improvements.

Effects of completed toll roads

Other effects on the Federal-aid program are felt once a toll road is completed. It is the responsibility of the toll-road authorities to locate the route and determine its access points to the maximum benefit to the route itself, an action that may be taken without regard to its effect on the free road network that must be integrated with the toll road.

With infrequent access points it may well happen that the volume of traffic that should be attracted to or discharged from the toll road at any particular interchange is too great to be satisfactorily accommodated on the existing crossroad. In such a case the public authorities will immediately be urged to improve the connecting highways, not only to benefit the toll road, but also as a proper service to the local traffic to be served by the interchange.

In addition, with interchanges widely spaced on the toll road, it will become necessary for the public officials to develop traffic-collecting routes and perhaps paralleling routes that would be unnecessary were the more frequent interchanges characteristic of a free route available.

This condition is particularly evident as a toll road approaches or bypasses an urban area. Here right-of-way costs and other factors that must be taken into consideration when a route is expected to be liquidated from toll revenues often prevent a close approach to the center of the urban area. Provision of the necessary connections

must then be made from public funds, involving routes that may, but equally well may not, be of the most service to the community as a whole.

Some of the adverse effects of toll roads on the programing of public highway improvements and many problems of integration of toll roads with public highway networks would be greatly alleviated if the responsibility for toll roads were vested in State highway departments. The consolidation of responsibility for toll and free highways would permit the most effective use of available engineering and technical personnel, avoid duplicating administrative organizations, and promote orderly development of all highway improvements.

RECOMMENDATIONS WITH RESPECT TO FEDERAL PARTICIPATION IN TOLL ROADS

1. *No Federal participation in toll roads.*—The present law forbidding the collection of tolls on highways constructed with Federal-aid funds should be continued.

2. *Inclusion of toll roads in Federal-aid systems.*—The present law should be changed to permit the inclusion of toll roads as part of the National System of Interstate Highways when they meet the standards for that system, and when there are reasonably satisfactory alternate free roads on the Federal-aid primary or secondary systems which permit traffic to bypass the toll road.

This recommendation is made to meet present-day conditions. A number of toll roads which are in operation, under construction, or authorized, lie along the preferred location of interstate routes; duplication of these roads would generally be an economic waste. Accordingly, if there is to be a continuous integrated Interstate System, it is reasonable that these toll roads be included in it. The inclusion of a toll road in the Interstate System would not be contrary to recommendation 1. It would merely make it unnecessary to construct a free road to interstate standards closely paralleling the toll road.

No toll roads should be permitted on any Federal-aid system except as provided in the first paragraph of this recommendation. Continuous travel over free roads will then be possible except over those portions of the Interstate System on which tolls are collected. On those portions, drivers will have the alternative of travel over a toll road built to interstate standards, or over a reasonably satisfactory free road of another Federal-aid route.

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PUBLIC UTILITY RELOCATION INCIDENT TO HIGHWAY IMPROVEMENT

COMMUNICATION

FROM

THE PRESIDENT OF THE UNITED STATES

TRANSMITTING

A REPORT ENTITLED "PUBLIC UTILITY RELOCATION
INCIDENT TO HIGHWAY IMPROVEMENT", PURSUANT
TO SECTION 11 OF THE FEDERAL-AID HIGHWAY ACT
OF 1954



APRIL 13, 1955.—Referred to the Committee on Public Works
and ordered to be printed

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LETTER OF TRANSMITTAL

THE WHITE HOUSE,
Washington, April 5, 1955.

HON. SAM RAYBURN,
Speaker of the House of Representatives,
Washington, D. C.

DEAR MR. SPEAKER: The Secretary of Commerce was directed by section 11 of the Federal-Aid Highway Act of 1954 to make a study of problems posed by the relocation of utility facilities resulting from improvements under Federal highway programs, and to submit a report to the President for transmittal to the Congress.

I am transmitting herewith a report entitled "Public Utility Relocation Incident to Highway Improvement", which has been submitted to me by the Secretary of Commerce.

Respectfully yours,

DWIGHT D. EISENHOWER.

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PUBLIC UTILITY RELOCATION INCIDENT TO HIGHWAY IMPROVEMENT

THE PUBLIC UTILITY RELOCATION PROBLEM

Traditionally, public utilities of various kinds have established themselves along, and more frequently within, public highway rights-of-way. This has been done generally pursuant to State constitutional or statutory authority to do so. Such permission, to make use of public highways, has most often been subject to restrictions in the public interest, the general tenor of these revolving around the protection of the traveling public and the preservation of the highway facility as an artery of travel.

In most States, too, such authority to use the public roads has been accompanied by either an express statutory proviso or an administrative determination by an executive agency of the State government, to the effect that, as the necessities of highway improvement require it, the public utility facilities are to be removed from one location within the highway rights-of-way to another, and at the expense of the utilities themselves.

In these circumstances, other factors have also come into play. These have consisted of (1) increases and shifts in the population in the various regions of the United States, (2) a pronounced trend toward increasing urbanization in the Nation, (3) a steady and substantial increase in the number and use of motor vehicles of all kinds, and (4) a resultant acceleration in the provision and improvement of highway facilities to accommodate the needs and demands for automotive travel.

The tempo of the provision of utility service has naturally increased in the wake of an increasing urbanization and suburbanization in the Nation.

As highway improvement and modernization have gone forward, the utilities have claimed that their resources were being subjected to a greater and greater burden, arising out of the need to relocate more and more of their facilities at their own expense, incident to highway betterment.

As a result of representations made to the Congress of the United States in connection with the 1952 and 1954 Federal-aid highway hearings, the Congress directed that a study be made of the problem, in section 11 of the Federal-Aid Highway Act of 1954, as follows:

The Secretary of Commerce is hereby directed to make a study in cooperation with the State highway departments and other parties in interest relative to the problems posed by necessary relocation and reconstruction of public utility services resulting from highway improvements authorized under this Act. Among other things, such a study shall include a review and financial analysis of existing relationships between the State highway departments and affected utilities of all types, and a review of the various State statutes regulating existing relationships, to the end that a full and informative report may be made to the President

for transmittal to the Congress of the United States not later than February 1, 1955.

It is pursuant to this directive that this investigation has been made.

SCOPE OF INVESTIGATION AND PROCEDURES

Cost data for this investigation were obtained from three different sources: (1) Bureau of Public Roads; (2) State highway departments; and (3) public utilities.

Since the Bureau of Public Roads reimburses the several State highway departments for public utility relocation costs arising out of highway development, to the extent permitted by State law as determined by such highway departments, it was necessary to assemble and analyze all such costs associated with the Federal-aid highway systems. Such data were developed directly from vouchers submitted to the Bureau of Public Roads by the several State highway departments. This data has been classified by three major funds or programs authorized by the Federal-aid laws, i. e., primary, secondary, and urban.

Public utility relocation cost data were obtained from the several State highway departments by questionnaire. Detailed information was sought for all highway projects for which final payment to the contractor (or completed by State or county forces) was made during calendar year 1953, or a more convenient (from the standpoint of State records) fiscal year that terminated in 1953. Data were sought for four system types: (1) Federal-aid primary;¹ (2) Federal-aid secondary; (3) primary State highways that are not Federal-aid primaries; and (4) all other State highways that are not Federal-aid secondary highways. Local highways under State jurisdiction, in such States as Alabama, Delaware, North Carolina, Virginia, and West Virginia, were to be excluded.

Each State highway department was also asked to report the total utility relocation costs reimbursed by the State and the total costs of the highway projects involving utility relocations.

The public utility relocation cost data that could be derived from both Federal and State records were only of limited scope. Such data reveal only the extent to which present laws permit reimbursement for public utility relocation costs. It became obvious very quickly that the whole public utility relocation cost picture could not be obtained without the cooperation of the public utilities themselves. Accordingly, representatives of all the major public utility groups were invited to assist in this investigation.

A national public utility steering committee was formed. Complementary State utility committees were formed in each jurisdiction by the national public utility steering committee. Representatives of the rural electrification utilities chose to furnish the desired data through the National Rural Electric Cooperative Association rather than the National or State public utility committees, though in some of the States, some of these data were submitted through the State public utility committee. Likewise, the petroleum pipeline groups furnished data directly through the Committee for Pipeline Companies.

¹ This system includes the National System of Interstate Highways.

Each State highway department was asked to assemble a schedule of all State highway projects for which final payment to the contractor was made by the State in 1953 calendar year or fiscal year terminating in 1953, whichever was more convenient from the standpoint of the State records. This list was made available by the several State highway departments to the cooperating utility committees in each State.

Sufficiently identifying information for each highway project included in the survey year was thus furnished to the State utility committees. Each utility within the State thereafter determined whether their records disclosed any public utility relocations that were associated with the highway projects on the schedule without regard to when the utility relocation took place. Many of such relocations took place prior to the survey year and some of them during the survey year. All kinds of highways and public utility projects would thus be included in the survey year and the opportunity was thus provided to obtain a representative cross section of the costs in the survey year. Fiscal or calendar 1953 is the last full year for which data could possibly be available both with respect to highway projects and public utility relocation projects.

Data which reflected the legal relationships which now exist between the several State highway departments and public utilities were obtained from many different sources: (1) State codes; (2) reports of all kinds of judicial decisions; (3) State highway department files; (4) State attorneys general; (5) Bureau of Public Roads records; (6) public utility association files; (7) special sources. An independent search was made of all current editions of State statutes and revisions thereof. The materials so obtained were checked against leads and citations obtained from the several State highway departments and the attorneys general of the several States. Hundreds of court decisions of many States were reviewed and approximately 250 of these were deemed to be pertinent to the subject under investigation. Attorney general opinions were also obtained.

PUBLIC UTILITY RELOCATION COSTS INCIDENT TO HIGHWAY IMPROVEMENT

Public utilities which have established themselves within public highway rights-of-way, or along them, incur certain costs when their utility facilities must be moved as a result of highway improvement. To the limited extent recognized by State law, a portion of such utility relocation costs is reimbursed the utilities by State or local governments. The Bureau of Public Roads participates in the reimbursement of State-approved utility relocation costs to the extent to which such States seek Federal participation.

The State highway departments reported that the total dollar value of all highway projects completed in the survey year 1953 amounted to approximately \$1.7 billion and involved 40,027 miles of highway and 10,245 highway projects. The public utilities which cooperated on the study reported that they could identify 5,422 utility relocations in connection with 3,836 of these highway projects. The dollar value of construction amounted to approximately \$1.1 billion, involving 13,868 miles of highway.

The utilities further indicated that these utility relocation costs for the survey year amounted to \$35.5 million. The bulk of this reported utility relocation cost involved utilities located within the highway right-of-way—\$29.1 million or 82 percent of the reported utility relocation cost.

The remaining \$6.4 million, or 18 percent, involved utilities located on their own private rights-of-way; in this case, the utilities reported that they were reimbursed \$4.6 million of their \$6.4 million cost. It is difficult to assign a reason why the remaining \$1.8 million was not reported as reimbursed. Most of the States reimburse utilities for relocation costs occasioned by highway improvements when the utilities are established on their own private rights-of-way. It may be that a portion of the \$1.8 million represents betterments, which normally would not be reimbursed. In some instances, claims for reimbursement were still pending at the time of this survey, and this may account for a portion reported as not reimbursed. See tables 1 and 2.

TABLE 1.—Public utility relocation cost and utility reimbursement, by project location and highway system, 1955: Utility located on highway right-of-way

Project location	Highway system							All systems
	Federal-aid highways			Other State highways			Total	
	Primary system	Secondary system	Total	Primary system	Other highways	Total		
Urban:								
Public utility relocation cost: 1								
Amount.....	\$13,366,654	\$860,349	\$14,227,003	\$642,588	\$356,358	\$998,946	\$15,225,949	
Distribution, percent.....	87.8	5.6	93.4	4.2	2.4	6.6	100.0	
Utility reimbursement:								
Amount.....	\$8,144,044	\$13,630	\$8,157,674	\$69,703	\$35,447	\$105,150	\$8,252,724	
Distribution, percent.....	96.7	0.4	97.1	1.8	1.1	2.9	100.0	
Rural:								
Public utility relocation cost: 1								
Amount.....	\$7,683,544	\$4,133,218	\$11,816,762	\$1,679,060	\$378,141	\$2,057,191	\$13,873,953	
Distribution, percent.....	55.4	29.8	85.2	12.1	2.7	14.8	100.0	
Utility reimbursement:								
Amount.....	\$414,298	\$81,473	\$495,771	\$44,721	\$34,454	\$79,175	\$574,856	
Distribution, percent.....	72.0	14.2	86.2	7.8	6.0	13.8	100.0	
Total:								
Public utility relocation cost: 1								
Amount.....	\$21,050,198	\$4,993,667	\$26,043,765	\$2,321,638	\$734,499	\$3,056,137	\$29,099,902	
Distribution, percent.....	72.3	17.2	89.5	8.0	2.5	10.5	100.0	
Utility reimbursement:								
Amount.....	\$8,558,282	\$15,003	\$8,573,285	\$104,424	\$69,901	\$174,325	\$8,727,610	
Distribution, percent.....	96.0	2.5	98.5	2.7	1.8	4.5	100.0	

1 Exclusive of betterment.
Source: Public utilities.

TABLE 2.—Public utility relocation cost and utility reimbursement, by project location and highway system, 1953: Utility located on private right-of-way

Project location	Highway system						All systems
	Federal-aid highways			Other State highways			
	Primary system	Secondary system	Total	Primary system	Other highways	Total	
Urban:							
Public utility relocation cost: 1							
Amount.....	\$1,593,845	\$25,768	\$1,619,613	\$2,510	\$129,080	\$131,590	\$1,751,503
Distribution, percent.....	91.0	1.5	92.5	0.1	7.4	7.5	100.0
Utility reimbursement:							
Amount.....	\$1,060,457	\$7,515	\$1,067,972	\$2,590	\$116,274	\$118,864	\$1,186,836
Distribution, percent.....	89.4	0.6	90.0	0.2	9.8	10.0	100.0
Rural:							
Public utility relocation cost: 1							
Amount.....	\$2,890,153	\$1,233,762	\$4,123,915	\$435,723	\$119,790	\$555,513	\$4,679,428
Distribution, percent.....	61.8	26.3	88.1	9.3	2.6	11.9	100.0
Utility reimbursement:							
Amount.....	\$2,233,570	\$810,334	\$3,043,904	\$301,647	\$68,149	\$369,796	\$3,413,700
Distribution, percent.....	65.4	23.8	84.2	8.8	2.0	10.8	100.0
Total:							
Public utility relocation cost: 1							
Amount.....	\$4,483,998	\$1,259,580	\$5,743,578	\$438,533	\$248,870	\$687,403	\$6,430,981
Distribution, percent.....	69.7	19.6	84.3	6.8	3.9	10.7	100.0
Utility reimbursement:							
Amount.....	\$3,294,027	\$817,849	\$4,111,876	\$304,237	\$184,423	\$488,660	\$4,600,536
Distribution, percent.....	71.6	17.8	84.4	6.6	4.0	10.6	100.0

1 Exclusive of betterments.
Sources: Public utilities.

The crux of the public utility relocation problem revolves around the \$29.1 million reported utility relocation cost involving utilities established within the highway rights-of-way. This cost was reported by the utilities to have been incurred almost equally divided between projects in urban and rural areas—\$15.2 million in urban areas and \$13.9 million in rural areas.

Of the \$15.2 million utility relocation cost on urban projects, the utilities reported reimbursements of \$3.3 million or 21.7 percent. In general, the State has the legal power to require uncompensated utility relocation in the highway right-of-way. But there are exceptions to this general rule, and these exceptions may account for the \$3.3 million reimbursement indicated above.

The main exception, which is found in the laws of California, Connecticut, and New Jersey, permits utility relocation reimbursement on utilities within the right-of-way when the relocations are necessitated by expressway construction. Of the \$3.3 million reported reimbursement in urban areas, indicated above, approximately \$1.9 million involved expressway projects; the bulk (\$1.7 million) of this amount was reported from the three States indicated. Practically (all but \$0.04 million) the entire balance of \$1.4 million concerned publicly owned utilities; here again, this reimbursement may be accounted for by another exception found in the laws of a number of States, namely, that publicly owned urban water, sewer, and transit utilities may be reimbursed. Investigation of the nature of the \$1.4 million reveals that practically all of it (\$1.36 million) involved publicly owned water, sewer, and transit utilities in urban areas.

That leaves only the rural counterpart of these utility relocation costs and reimbursements to be commented upon. As already indicated, according to the prevailing law of practically all States, the reimbursement of the relocation costs of utilities established within the highway rights-of-way is not required. This is substantiated by the cost data. Of the \$13.9 million utility relocation cost reported by the utilities to have been incurred in connection with rural highway projects in the survey year, a little more than half a million dollars (\$574,886) was reimbursed by government.

Here again, as in the case of the urban facilities, utility relocations arising out of expressway construction account for approximately half (\$245,771) of the indicated reimbursements. Of the balance, approximately \$69,000 were reimbursed publicly owned utilities, presumably under legal authorization applicable to such utilities. The balance of the utility relocation cost reimbursed the privately owned and co-operatively owned utilities can perhaps be accounted for by payments made in those States where the law permits the State highway department to determine the extent of reimbursement in the circumstances indicated.

Utility relocation costs analyzed by designated characteristics.—An analysis of utility relocation costs by type of highway system is of interest. Of the reported utility relocation cost of \$35.5 million, 89.5 percent was incurred in connection with the Federal-aid systems, and 10.5 percent on State highways not on the Federal-aid systems. The reimbursements by governments of such utility relocation costs were made roughly in the same proportions.

The bulk of the reported relocation costs and reimbursements took place in connection with the Federal-aid primary system. Such relocation cost constituted 71.9 percent of the total on both highway and private rights-of-way, and 72.3 percent on highway rights-of-way alone; the reimbursements on the Federal-aid primary system were 81.3 percent of total reimbursements on both highway and private rights-of-way and 93.0 percent on highway rights-of-way alone.

Of a reported utility relocation cost of \$35.5 million, 27.5 percent was incurred in connection with expressway projects, 21.5 percent in connection with divided highways other than expressways, and the balance of 51.0 percent on other highway types; this involved utility costs on both highway and private rights-of-way. Approximately these same proportions obtained when the data were separated into their highway and private right-of-way components.

Utility types were classified into nine different categories. Of the \$35.5 million of utility relocation cost reported, electric and power, and telephone utilities together accounted for 68.3 percent—35.0 percent and 33.3 percent, respectively. Gas accounted for 13.8 percent, and water for 10.7 percent. All other utilities grouped together accounted for the balance of 7.2 percent.

Utility ownership can be grouped into three categories, i. e., publicly owned utilities, privately owned, and cooperatively owned. Of the \$35.5 million utility relocation cost reported, 82.5 percent was associated with utilities that were privately owned, 15.9 percent with utilities publicly owned, and 1.6 percent with those cooperatively owned.

Agencies at different levels of government were involved in the reimbursement of portions of the utility relocation costs reported herein. The bulk of the utility relocation costs reimbursed was reimbursed by the State highway departments. Of a total reimbursement of more than \$8.4 million, \$7,292,245, or 86.5 percent, was so returned to the utilities. Local units of government—the city, the county or the township—reimbursed another \$354,480 or 4.2 percent. The Federal Government, other than the Bureau of Public Roads,² was responsible for another \$189,034, or 2.2 percent. The balance was reimbursed jointly by the State and Federal Government (other than Bureau of Public Roads), State and county, county and township, or was not reported upon in terms of type of reimbursing government.

Completeness of the data.—Data were obtained from the State highway departments with respect to public utility relocation projects for which some reimbursement by State government was made. The State highway departments reported a State reimbursement for utility relocation of \$15,986,750 on highway projects, the dollar value of which was \$712,333,943. As already indicated, the utilities reported a reimbursement for utility relocation by the States alone or by the States and some other governmental agency of only \$7,310,426 on highway projects valued at \$1,097,869,815. See tables 3 and 34.

These substantial differences would seem to suggest that the State highway department data include public utility relocation projects that are not included in the data reported by the public utilities.

² Since the Federal-aid highway funds available for utility relocation reimbursement are channeled through the State highway departments, such funds were included under "State."

To depict more precisely the area of difference between the two sources of data, the following tabulation presents the public utility relocation costs reimbursed by the States, classified by the ownership of the utilities to which reimbursements were made, as reported by the State highway departments and the utilities:

Source of data	Publicly owned utilities		Privately owned utilities		Cooperatively owned utilities	
	Reimburse-ments by States	Reimbursing agency not indicated	Reimburse-ments by States	Reimbursing agency not indicated	Reimburse-ments by States	Reimbursing agency not indicated
State reports.....	\$7,946,873	-----	\$7,383,822	-----	\$657,056	-----
Utility reports.....	2,056,026	\$258,482	5,134,925	\$271,522	119,475	\$43,917

This comparison indicates that a substantial percentage of privately owned utilities submitted data; whereas, relatively few publicly owned or cooperatively owned utilities submitted questionnaire returns.

TABLE 3.—Total State highway expenditures for public utility relocation and total cost of highway improvements involving such utility relocation, by project location and highway system

Highway system	Urban				Rural				Total			
	State expenditure for public utility relocation		Cost of highway improvements involving reimbursed utility relocation		State expenditure for public utility relocation		Cost of highway improvements involving reimbursed utility relocation		State expenditure for public utility relocation		Cost of highway improvements involving reimbursed utility relocation	
	Amount	Distribution	Amount	Distribution	Amount	Distribution	Amount	Distribution	Amount	Distribution	Amount	Distribution
Federal-aid highways:		Percent		Percent		Percent		Percent		Percent		Percent
Primary system.....	\$8,305,681	86.4	\$218,166,600	84.2	\$4,156,608	65.2	\$282,493,343	62.3	\$12,463,280	77.9	\$500,650,843	70.3
Secondary system.....	168,910	1.7	5,106,703	2.0	1,653,170	25.9	125,282,028	27.7	1,822,086	11.4	130,388,731	18.3
Subtotal.....	8,475,597	88.1	223,273,303	86.2	5,809,778	91.1	407,775,371	90.0	14,285,375	89.3	631,045,574	88.6
Other State highways:												
Primary system.....	395,324	4.1	28,587,700	11.0	449,124	7.1	37,231,747	8.2	844,448	5.3	65,819,447	9.2
Other highways.....	744,245	7.8	7,346,896	2.8	112,682	1.8	8,119,026	1.8	866,927	5.4	10,465,922	2.2
Subtotal.....	1,139,569	11.9	35,934,596	13.8	561,806	8.9	45,350,773	10.0	1,701,375	10.7	81,285,369	11.4
Grand total.....	9,615,166	100.0	259,207,799	100.0	6,371,584	100.0	453,126,144	100.0	15,986,750	100.0	712,330,943	100.0

Source: State highway departments.

Because of the small amounts involved, the relatively small return of the cooperatively owned utilities probably would not change the total relocation cost picture very much, though it could have a significant bearing on certain components of the total. The small return obtained from the publicly owned utilities, however, invalidates any deductions that could be drawn or inferences which can be made concerning total public utility relocation costs or reimbursements, and certainly with respect to such data in urban areas where the publicly owned utility plays such an important role.

It is impossible to indicate, therefore, what the actual total public-utility relocation cost and total reimbursement amounted to in the survey year 1953.

Federal-aid highway expenditures for utility relocation.—Because data on Federal-aid highway expenditures for utility relocation are more readily available, more detail concerning such data has been provided. The Federal participation in the reimbursement of utility relocation expenditures which is claimed by the States has been analyzed for the period July 1, 1949, to June 30, 1954. During this period 30 States and Hawaii have sought such reimbursement. The bulk of the utility relocation costs involving Federal-aid participation concerned utility facilities located outside the highway right-of-way; they involved utility relocation within the highway rights-of-way only to the extent to which the States involved are permitted by their own laws to reimburse therefor. The costs of public-utility adjustments that are performed by the contractors for the State highway projects are not reported. It would be very difficult to make an accurate determination of such costs because utility adjustments which are part of the highway contract are so closely related to the highway work itself that to make segregation therefrom is a challenge in each particular case.

In the 5-year period indicated, public-utility relocation costs on Federal-aid projects for which reimbursement for such utility costs was sought amounted to \$2,047,365, of which the Federal Government reimbursed \$650,885, or 31.8 cents of each dollar of relocation cost. The total reported costs of Federal-aid highway projects involving these utility relocations amounted to \$231,512,025, of which the Federal share was \$120,072,041.

In the same 5-year period, the total cost of all Federal-aid highway projects amounted to \$4,320,567,319, of which the Federal share was \$2,195,882,054. It is of interest to note that the cost of highway projects involving utility relocation and Federal reimbursement represents approximately 5 percent of the dollar value of all Federal-aid highway projects in the period. Of every such highway dollar spent for highway improvement (by both State and Federal Governments) on Federal-aid highways, 0.05 of 1 cent was spent for public-utility relocation, on and off the highway right-of-way, for projects involving Federal reimbursement of utility costs. For every Federal highway dollar spent for such highway improvement, 0.03 of 1 cent was spent for public-utility relocation.

For an analysis of the data for a single year, the most recent available fiscal year, that ending June 30, 1954, is deemed to be the most representative. In this year, approximately three-quarters of the \$652,012 utility relocation cost was spent in connection with Federal-

aid rural projects involving Federal reimbursement for utility costs and the remaining quarter on urban improvements. See table 4.

TABLE 4.—Summary of public-utility relocation cost and cost of highway projects involving such relocation, on Federal-aid highways, by project location, July 1, 1953, to June 30, 1954

	Utility relocation cost		Cost of highway projects involving utility relocation		Utility cost per dollar of cost of highway projects involving utility relocation	
	Total	Federal share	Total	Federal share	Total	Federal share
Urban.....	\$174,896	\$52,371	\$20,087,028	\$10,564,129	Cents 0.87	Cents 0.50
Rural.....	477,116	153,370	56,744,611	28,879,127	.84	.53
Total.....	652,012	205,741	76,831,639	39,443,256	.85	.52

Source: Bureau of Public Roads.

Pursuant to the Federal-aid highway laws, Federal-aid highways are grouped into three broad classes: Primary, secondary, and urban. Table 5 groups public utility relocation expenditures and the associated highway costs on this basis. Over 60 percent of the utility relocation cost involving Federal reimbursement on Federal-aid highways was spent in connection with primary highway projects, 27 percent on secondary highways, and the balance of 13 percent on urban highway projects. See table 5.

TABLE 5.—Summary of public utility relocation cost and cost of highway projects involving such relocation, by type of Federal-aid highways, July 1, 1953 to June 30, 1954.

Type of Federal-aid highway	Utility relocation cost		Cost of highway projects involving utility relocation		Utility cost per dollar of cost of highway projects involving utility relocation	
	Total	Federal share	Total	Federal share	Total	Federal share
Primary.....	\$392,337	\$114,064	\$42,006,800	\$21,689,297	Cents 0.93	Cents 0.53
Secondary.....	173,844	56,550	21,927,368	10,956,330	.79	.52
Urban.....	85,831	35,137	12,897,471	6,797,629	.67	.52
Total.....	652,012	205,741	76,831,639	39,443,256	.85	.52

Source: Bureau of Public Roads.

A grouping of public utility relocation costs involving Federal reimbursement by type of utility reveals that the bulk of such costs is associated with only three utility types. For example, electric and power utilities accounted for over 47 percent of all utility relocation expenditures for which Federal reimbursement was requested, telephone and telegraph for over 31 percent, and all other utility types for the balance of 22 percent.

Public utilities may be publicly owned, privately owned, or cooperatively owned. For the 5-year period for which data on Federal-aid

expenditures involving utility reimbursement were accumulated, almost 75 percent of the utility relocation costs involved privately owned utilities, approximately 17 percent publicly owned utilities, and 8 percent cooperatively owned enterprises.

Appendix data on costs.—More detailed analyses of public utility relocation costs are contained in the appendices. For the data on Federal-aid reimbursed public utility relocation costs, see appendix A. For data on State expenditures for public utility relocation, as reported by State highway departments, see appendix B. For data on public utility relocation costs, as reported by the utilities, see appendix C.

LEGAL RELATIONSHIPS OF STATE HIGHWAY DEPARTMENTS AND PUBLIC UTILITIES

The legal relationships which now exist between the several State highway departments and public utilities of various kinds are determined by State constitutional provisions, State statutes, and court decisions construing such relationships. These legal aspects are important since they determine and explain State practices and State reimbursement policy with respect to public utility relocation.

Constitutional provisions.—There is little in State constitutions relating directly to the relocation of public utility facilities incident to highway improvements. The only pertinent provisions pertain to the occupation of roads and streets by public utilities; these were found in 18 State constitutions.³ These constitutional provisions require in effect that permission of the appropriate local governing body must be obtained before utilities may occupy the streets or highways of cities, towns, and other local governmental units.

State statutes.—Statutory provisions permitting the use of public highways and streets by public utilities are found in each of the 48 States, the District of Columbia, Hawaii, and Puerto Rico. Such laws specifically applicable to the occupation of State highways, as distinguished from other types of public highways, may be found in 43 jurisdictions.⁴ The remaining jurisdictions have statutory provisions applicable to all public roads, which presumably would include State highways.⁵

Though such use is universally permitted by statute, restrictions of various kinds are usually placed on the occupancy by utilities of public highway rights-of-way. A franchise, permit, or other permission to occupy the highway right-of-way by all utilities, obtained from the State highway department or other appropriate body, is required by statute in 15 jurisdictions.⁶

In 26 other States,⁷ a franchise, permit or other permission must be

³ Alabama, art. XIII, sec. 220; Colorado, art. XV, sec. 11; Idaho, art. XI, sec. 11; Illinois, art. XI, sec. 4; Kentucky, secs. 163 and 164; Michigan, art. 8, sec. 28; Minnesota, art. 10, sec. 4; Missouri, art. 11, sec. 11; Montana, art. 15, sec. 12; New York, art. 3, sec. 17; North Dakota, sec. 139; Oklahoma, art. 18, secs. 5 (a) and 7; South Carolina, art. 8, sec. 4; South Dakota, art. 17, sec. 10; Texas, art. 10, sec. 7; Utah, art. 12, sec. 8; Virginia, art. VIII, secs. 124 and 125; West Virginia, art. XI, sec. 5.

⁴ Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

⁵ Arizona, Idaho, Montana, Rhode Island, Vermont, District of Columbia, Hawaii, and Puerto Rico.

⁶ California, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, New Hampshire, New Jersey, North Carolina, Pennsylvania, Washington, West Virginia, Wisconsin, and Hawaii.

⁷ Alabama, Arkansas, Colorado, Florida, Georgia, Iowa, Kansas, Louisiana, Maine, Michigan, Mississippi, Missouri, Nevada, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, and Wyoming.

so obtained by designated utilities (not all utilities) for occupancy of the State highways. In five additional jurisdictions, statutes require such franchise, permit or other permission to be obtained by designated utilities (not all utilities), for the occupancy of all public highways, as distinguished from State highways only.⁸

Statutory restrictions placed on the occupancy of the public highway rights-of-way by utilities sometimes require that such utilities conform to regulations promulgated by the State highway department or other appropriate body. With respect to State highways only, 17 States have laws containing such requirements for all utilities.⁹ Similar laws involving only specified (rather than all) utilities are to be found in 19 other jurisdictions.¹⁰ In five additional States,¹¹ statutes require specified utilities occupying any public street or highway to conform to regulations promulgated by the appropriate public agencies.

Another provision, found in the laws of 24 jurisdictions,¹² permits specified public utilities to occupy State highway rights-of-way on the condition that their facilities do not interfere with the ordinary use of the highway. Similar laws applicable to any public street or highway (rather than State highways only) are found in 21 other jurisdictions.¹³

Laws found in 20 jurisdictions specifically provide that designated public utilities occupying the public highway rights-of-way must be moved and at the expense of the utilities themselves, when necessitated by highway betterment.¹⁴ The statutes of five other States¹⁵ require all or specified utilities to move their facilities incident to a highway improvement, but no reference is made in the statutes as to who is to pay the costs thereof. However, court decisions, attorney general opinions or an obvious construction of the statutes themselves in these five States indicate that the utility must pay if its facilities are located within the highway right-of-way. See table 6. In four jurisdictions,¹⁶ statutory distinctions are made between publicly owned and privately owned utilities with respect to who shall bear the cost of utility relocation; in these instances, the statute provides that the highway department must pay all or a part of the cost when publicly owned utilities are to be relocated, under designated circumstances.

⁸ Arizona, Connecticut, Montana, District of Columbia, and Puerto Rico.
⁹ California, Delaware, Illinois, Indiana, Maryland, Massachusetts, Minnesota, Mississippi, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Pennsylvania, Washington, and West Virginia.
¹⁰ Alabama, Arkansas, Florida, Georgia, Iowa, Kansas, Kentucky, Louisiana, Maine, Nebraska, Nevada, New Mexico, Oregon, South Carolina, South Dakota, Texas, Utah, Virginia, and Hawaii.
¹¹ Connecticut, Missouri, Oklahoma, Wisconsin, and the District of Columbia.
¹² Arkansas, California, Delaware, Georgia, Indiana, Iowa, Kentucky, Louisiana, Maine, Michigan, Mississippi, Nebraska, New Hampshire, New Jersey, Ohio, Oregon, South Carolina, South Dakota, Texas, Utah, Virginia, Washington, Wyoming, and Hawaii.
¹³ Colorado, Connecticut, Florida, Idaho, Illinois, Kansas, Maryland, Missouri, Montana, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Vermont, Wisconsin, the District of Columbia, and Puerto Rico.
¹⁴ California, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, Ohio, Oklahoma, Texas, Washington, West Virginia, Wisconsin, District of Columbia, and Hawaii.
¹⁵ Florida, Oregon, Pennsylvania, South Dakota, and Virginia.
¹⁶ New York, West Virginia, Wisconsin, and Hawaii.

TABLE 6.—Statutory provisions pertaining to relocation of public utility installations on State highways, 1954

State	Type of utility	Removal or relocation necessary because utility constitutes obstruction		Removal or relocation necessary because highway improvement		Location: Urban or rural	Public or private ownership of utility	Relocation in right-of-way or outside right-of-way required
		Who moves	Who pays	Who moves	Who pays			
California	County, city, public corporation, or political subdivision authorized by law to establish or maintain works or facilities in, under or over any public highway; private corporations, (any tower, pole, pipe line, pipe, pipeline), or any structure or object. Any person who has placed and maintained any pole, pipe line, pipe, pipeline, conduit, street railroad tracks, or other structures or facilities. (Includes holders of franchises granted by any county or city in highway which is on State highway.)	Utility	Utility	Utility	Utility	do	Either	Either
Florida	Underground sanitary sewers or gas or water main or other similar public utility.	Utility	Utility	do	Utility	Urban	Either	In right-of-way.
Indiana	Street railway, interurban railway or steam road; sewers and connecting drainage facilities.	Utility	Utility	do	do	do	do	Do.
Iowa	Local (telephone) cooperative corporation. Poles used for telephone, telegraph, or other transmission purposes.	do	do	Utility	do	do	Cooperative. Private.	Do. Do.
Kansas	Gas and water mains. Telegraph, telephone, or electric transmission lines; pipelines for transmitting oil, gas, or water.	Utility	Utility	Utility	Utility	do	do	Do. Do.
Kentucky	Telephone, telegraph, electric railway, or other electrical companies. Telegraph, telegraph, electric light, or other poles, gas, water, sewerage, oil, or other pipelines, or other similar obstructions. Underground pipes, conduits, or cables for transporting telephone or telegraph messages, fluids, gases, or electric current; overhead cables, conduits or wires for transmission of telephone or telegraph messages, gases or electric current.	do	do	do	do	do	do	Either. ³
Louisiana		do	do	Utility	Utility	Rural	Private	Do. ³
		Utility	Utility	Utility	Utility	Either	Either	Do. ³

See footnotes at end of table, p. 17.

TABLE 6.—Statutory provisions pertaining to relocation of public utility installations on State highways, 1954—Continued

State	Type of utility	Removal or relocation necessary because utility constitutes obstruction		Removal or relocation necessary because of highway improvement		Location: Urban or rural	Public or private ownership of utility	Relocation in right-of-way or outside right-of-way required
		Who moves	Who pays	Who moves	Who pays			
Mississippi	Telephone, telegraph or other poles, gas, water, sewerage, oil, or other pipelines, or other obstructions.	Utility	Utility	Utility	Utility	State highways	Private or other owners.	Either. ¹
Missouri	Telephone, telegraph and electric light and power transmission lines, poles, wires, and conduits and all pipelines and tramways. Conduits, poles, pole lines, wires, mains, pipes, conductors, sewers, drains, tramways or other objects. ²	do.	do. ⁴	do.	do. ⁴	Any State highway.	Any corporation, association, or person.	In right-of-way.
Nebraska	Telegraph, telephone, or electrical transmission lines.			do.	do.	State or Federal highway.	Private.	Do. ³
New Hampshire	Telephone, telegraph, or other public utilities including railroads and street railways.	Utility ¹	Utility	do. ¹	do.	State highways.	do.	In right-of-way.
New Mexico	Pole lines, conduits, wires, or cables.			do.	do.	State highway.	Any person, company or corporation.	Do.
New York	Water mains, sewer pipes, and any other municipally owned facilities.			State or municipality.	State.	Urban.	Public.	Do.
North Carolina	Telephone, telegraph, or other poles, gas, water, sewerage, oil, or other pipelines or similar obstructions.	Utility	Utility			State highways.	Private.	Do.
Ohio	Individual, firm, or corporation (includes telephone and telegraph and electric light companies).	do. ¹	do.	Utility ¹	Utility	Road or highway on State highway system.	Individual, firm or corporation.	Do.
	Telegraph or telephone lines, steam, electrical or industrial railways, oil, gas, water, or other pipes, mains, conduits, or any object or structure other than by virtue of franchise or permit granted and in force.	do.	do.	do.	do.	Either.	Private.	Outside right-of-way.
	Telegraph or telephone lines, steam, electrical or industrial railways, oil, gas, water or other pipes, mains, conduits, or any other object or structure, by virtue of franchise or permit granted and in force.	do.	do.	do.	do.	do.	do.	In right-of-way.
Oklahoma	Street, interurban, or other railway.			do.	do.	State highways.	do.	Do.
	Telephone, telegraph, and electric light and power transmission lines, poles, wires, and conduits and all pipelines and tramways.			do.	do. ⁴	Any State highway.	do.	Do.

Oregon	Telephone or telegraph lines, and lines and wires for conveying electric power or electricity.	Utility	Utility ¹	do.	do. ¹	Rural	do.	Do.
Pennsylvania	All public utility companies.			do.	do. ¹	Urban	do.	Do.
South Dakota ²	Electric light and power; telephone.			do.	do. ¹	Any public highway.	Either	Do.
Texas	Water. Electric cooperatives and other corporations engaged in generating, transmitting, and/or distributing electric energy.			do.	do.	Rural.	do.	Do.
	Gas.			do.	do.	do.	do.	Do.
Virginia	Railroad tracks, pipes, poles, wires, conduits, or other structures or facilities located in highway right-of-way used by water and sewer authority.	Utility	Water and sewer authority.	do.	Water and sewer authority.	Primary or secondary highway.	Not specified.	Not specified.
	Telegraph, telephone, heat, light, power, water, etc.	do.	Utility ¹			State highway system.	Private.	Either. ⁴
Washington	Any property or occupancy on right-of-way.	do.	do. ¹	do.	Utility ¹	State highway.	do.	Do. ³
	Water pipes, flumes, gas pipes, telephone, telegraph and electric light and power lines and conduits, trams or railways, and any other such facilities.	do.	do.	do.	do.	Either.	Either.	Do. ³
West Virginia	All public service companies.			do.	do. ⁷	Urban.	do.	In right-of-way.
	Telephone, telegraph, electric railway, or other electrical companies; pipeline companies for gas, oil, water, or any other substance.	Utility	Utility			State road.	Private.	Either. ³
Wisconsin	Water, gas or heat mains and sewers.			Municipality.	A butting landowner.	Urban.	Public.	In right-of-way. ⁵
District of Columbia	Water or gas mains.			Utility.	Utility ⁸	do.	Private.	Do.
	Gas.			do.	do.	do.	do.	Do.
	Telephone.	Utility	Utility ¹			do.	do.	Do.
	Telegraph.	do.	do. ¹			do.	do.	Do.
Hawaii	Any utility facility.			Utility	Utility ⁹	Any Territorial or Federal-aid highway.	do.	Either. ³
	do.			do.	Territory.	do.	Public.	Do. ³

¹ Moving at own expense implied.
² Authority is lodged with county.
³ Utility is required to remove or relocate or both.
⁴ Unless otherwise provided by State highway commission.
⁵ Reason for change not specified.
⁶ Telegraph and telephone companies may not be required to move facilities outside of right-of-way.
⁷ Costs not chargeable against municipality to extent same imposes indebtedness in excess of amount allowed by existing law.
⁸ Unless franchise of utility otherwise provides as to cost.
⁹ Utility pays 1/2 of cost in excess of \$3,000; Territorial government pays remainder.

There are now 37 States which have specific legal authority to control highway access.¹⁷ The statutes in three of these States contain provisions dealing with the relocation of utility facilities in connection with expressways.¹⁸ Statutory treatment in each of these three cases varies. The State highway department, under specially designated circumstances outlined in the statutes, assumes part of the cost of utility relocation. See table 7.

State toll-road legislation was also investigated. State or Federal-aid highways are not involved, and only occasionally are State highways participants in such toll enterprises. Toll-road legislation in 24 States contains provisions relating to public utilities.¹⁹ Generally, the same type of regulation of public-utilities installations in turnpike rights-of-way are provided for in these laws as in statutes pertaining to toll-free highways. Thus 17 State statutes authorize the turnpike authority to make reasonable rules and regulations governing the installation of utilities in the toll road.²⁰

¹⁷ Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

¹⁸ California, Connecticut, and New Jersey.

¹⁹ Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, Texas, Virginia, West Virginia, and Wisconsin.

²⁰ Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, Nebraska, New Hampshire, New Jersey, North Carolina, Ohio, Rhode Island, Texas, and Virginia.

TABLE 7.—Statutory provisions relating to relocation of public utilities in expressways

State	Type of utility	Public or private utility	Utility relocated within or off right-of-way	Who pays	Conditions
California	Any utility do do do	Either Private Public Private (See col. 2)	Off right-of-way In right-of-way do do	State Utility State do do	Applies only to State highways which are or may become freeways. Do If freeway was not State highway at time facility was installed. If freeway was not State highway at time facility was installed and utility was not under contractual obligation to relocate facilities at own expense.
Connecticut	Publicly owned sewers and fire hydrants; structures. Sewer pipe, main, conduit, cable, wire, pole, tower, building, or utility appliance owned or operated by electric, gas, telephone, telegraph, or water company or any municipal government.	Either	Either	Shared	State does not pay for private right-of-way when facility removed from highway right-of-way.
New Jersey	Any public utility	Private	do	State	Order of State highway commissioner for removal or relocation outside expressway to be approved by board of public utility commissioners.

But there are two departures. One is that the turnpike authority is often authorized to charge for the use of the turnpike right-of-way by public utilities. Eighteen State toll-road laws authorize the turnpike authorities to fix the terms and conditions, rates and charges under which public utilities may be permitted to occupy the turnpike right-of-way.²¹ The other concerns the matter of who pays for the relocation of utilities. The laws of 19 States make some provision for the relocation of utilities.²² Most of these laws seem to direct the toll-road authority to pay the cost of relocation of utility facilities; but it is not too clear from some of the laws whether this applies to utilities located on their own private right-of-way, which must relocate to accommodate a toll-road improvement, or to utility facilities located on the toll-road right-of-way.

Federal legislation.—Under the Federal-aid laws and regulations issued thereunder, the Bureau of Public Roads, in the administration of the regular Federal-aid highway program, makes reimbursement to the States for utility relocation costs to the extent that the States involved are required under their own laws and procedures to pay for such costs. In addition, the Federal-aid highway laws contain certain provisions under which Federal funds may participate up to 100 percent in the costs of projects for the elimination of hazards of railway-highway crossings; a 10 percent contribution by the railroads is required for certain classes of these projects. Aside from the above, no Federal legislation of general application could be found relating to Federal reimbursement of public-utility relocation costs arising out of highway improvement.

*Judicial decisions.*²³—An analysis of the legal aspects of public-utility relocation arising out of highway improvement obviously would be incomplete without reference to the pertinent court decisions and opinions of the attorneys general of the several States. Such an analysis has been made of 250 of the most important judicial decisions. The following are some of the general principles which have been enunciated by the courts in such cases.

The State legislature exercises sovereign and plenary control over all public highways within its jurisdiction. This is true whether the State has obtained a fee simple title in the lands which it acquires for highway purposes or merely an easement for highway purposes. The State legislature may, and often does, delegate control over some of these highways to a State highway department, and over others to local governmental units.

Public highways are designed primarily for the use of the traveling public. However, such highways may be used for any purpose which serves the public's interest in transportation, communication, sewage, health, or related matters. Thus, it is a generally accepted principle of common law, sometimes codified in State statutes, that public utilities designed to serve these public purposes may also make use of the highways for the location of their facilities and equipment.

However, any use by utilities of highway right-of-way is subordinate to the use of the highway by the traveling public. Accordingly, the placement, construction, and maintenance of utility facilities within

the highway right-of-way are subject to reasonable control by the appropriate governmental body, and the utility's use of the highway must not inconvenience, incommode, or hamper the public in its ordinary use of the highways. These limitations and conditions on the utility's use of the highways are either specifically indicated in State constitutions or statutes or they are implied under general common-law principles.

Inherent in every government is the power to make reasonable rules and regulations for the health, safety, general welfare, and convenience of its people. This is identified as the police power, and is so vital a power that it cannot be contracted away or limited in any manner whatsoever, and is an implicit term of every grant by any governmental unit.

Utilities which locate their facilities within the public highway rights-of-way accordingly do so subject to reasonable police-power regulations. The improvement of existing highways, whether it consists of grading, widening, relocating, eliminating grade crossings, limiting access, or of any other necessary engineering treatment, is considered to be within the powers of the appropriate highway authorities and a proper subject for the invocation of the government's police power.

The government's power to require uncompensated obedience to its reasonable police regulations must be qualified by the principle that private property cannot be taken without just compensation, even for public purposes, nor can property rights be limited or injured for the benefit of other private individuals or corporations, including municipal corporations acting in their proprietary capacities, without such compensation. Ordinarily, the requirement that a utility move or relocate its facilities is not compensable because such a move is not considered to constitute a taking.

The courts have uniformly held that utilities can be required by the State acting through its legislature, its highway department, or local governmental units, to move their facilities in order to facilitate highway improvements; such requirements are considered reasonable police regulations. Since a police power regulation is involved, the courts have said the utility is not entitled to any compensation or reimbursement for the cost of the required move, in the absence of a clear, express statutory mandate shifting the burden of the relocation cost from the utility to the State. Any damage the utility suffers is merely consequential and incidental to the reasonable regulation of its property in the public interest.

This is true whether the utility facilities are located under, over, in, or upon the highway, regardless of the type of the improvement of the highway, and regardless of the nature or source of the utility's permission to locate its facilities within the public right-of-way.

The only exceptions to these general principles have occurred when there has been unreasonable discrimination against one utility, or when a utility's relocation has been designed for the benefit of another utility or for the benefit of a municipality acting in its proprietary capacity.

Where public utilities are located entirely on their own private rights-of-way, and where a proposed highway improvement will engulf the utility facilities requiring their relocation or removal, the courts have been diligent in protecting the rights of the utilities.

²¹ Florida, Georgia, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Michigan, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Virginia, and West Virginia.

²² Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, Nebraska, New Jersey, New York, North Carolina, Ohio, Oklahoma, Rhode Island, Texas, Virginia, and Wisconsin.

²³ For citations to the court decisions enunciating these general principles, see appendix D.

Such utilities have been treated in the same manner as have private landowners, and the courts have held that their property must be acquired by purchase or condemnation.

The Federal Government participates in some highway projects by cooperating with other Federal departments in constructing highways to and in national parks, national forests, national monument areas, military and naval reservations, Indian lands, and other Federal lands. In aid of these programs, the Federal Government exercises a power akin to that of the police power of the States, and can compel utilities to relocate their facilities located within the rights-of-way of such highways when highway improvements require it.

Law and practice by States.—An analysis of the law and practice concerning public utility relocation in highway right-of-way and cost responsibility, by States, is contained in appendix E. Only the predominant features of the law and practice have been included.

SOME STATE PRACTICES CONCERNING UTILITY RELOCATION IN CASES WHERE REIMBURSEMENT IS INVOLVED

In those cases where utilities are reimbursed for the relocation of their facilities because of highway improvements, several additional points should be mentioned. An important one concerns betterments made to utilities at the time of the utility relocation, and methods for determining reimbursable costs where such betterments are involved. Another one involves successive readjustments of public utility facilities as a result of successive highway improvements involving the same sections of highway within short periods of time.

Data shedding light on these special matters have been assembled from the respective State highway departments and are summarized in the following paragraphs.

Betterment of utility facilities.—When public utilities are relocated as a result of highway improvement, it frequently becomes desirable, from the standpoint of the public utility, to replace the existing utility facilities with equipment that is superior in quality or capacity. For example, suppose a 10-inch water main is replaced by a 12-inch main, incident to readjustment resulting from a highway improvement. How is this public utility betterment handled when it comes to reimbursement by the State for the utility relocation? In such cases, a complex reimbursement problem develops.

Where reimbursement for utility relocation costs is made, it is the practice in most States not to reimburse the utilities for such betterments. The precise methods for determining reimbursable costs where such betterments are involved, however, vary from State to State. For a summary of these methods, by States, see appendix F.

Successive utility relocations occasioned by successive highway improvements.—This survey indicates that successive readjustments of public utility facilities as a result of successive highway improvements involving the same sections of highway within short periods of time rarely occur.

Of the 51 jurisdictions queried on this subject, 36 did not cite any instances within the last decade where a second relocation of utility facilities became necessary as a result of a second highway improve-

ment on a given location within that period.²⁴ In three of these, records which would disclose second moves were not readily available.²⁵ Of the 15 remaining jurisdictions, 7 reported 8 cases of second relocations of this kind;²⁶ in 5 of the 8 instances reported, the State highway department accepted the cost responsibility for the second required utility readjustment.

In the remaining eight jurisdictions,²⁷ State policy was cited with no specific instances reported. California accepts full cost responsibility for a second or any subsequent relocation within the highway right-of-way. In Colorado, most utilities acquire their own rights-of-way, after one relocation from a public right-of-way and second moves would, therefore, be at the State's expense. In Arizona, the utilities pay for second moves. If a second relocation should occur in Georgia or Mississippi, the utilities would be required to pay. In Connecticut, second moves are treated in the same manner as first moves. In New Jersey, each case is reviewed on the merits and an equitable division of costs is made. Both the highway department and utility companies in Pennsylvania endeavor to anticipate and forestall second moves.

State utility relocation practices when Federal aid is involved.—The majority of States reported that no distinctions exist in the treatment of public utility relocations on Federal-aid highway projects and those involving State funds exclusively. Several jurisdictions reported that Federal-aid projects are treated substantially the same as State highway projects except that, where Federal-aid is involved, accounting methods must conform to the requirements of the Federal-aid highway laws and administrative regulations issued pursuant thereto. Such requirements are not in any way related to the fact that a utility relocation is involved.

²⁴ Delaware, Florida, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Wisconsin, Wyoming, District of Columbia, and Puerto Rico.

²⁵ Maine, Massachusetts, and Texas.

²⁶ Alabama, Arkansas, Hawaii, Ohio, Oklahoma, Washington, and West Virginia.

²⁷ Arizona, California, Colorado, Connecticut, Georgia, Mississippi, New Jersey, and Pennsylvania.

APPENDIXES

APPENDIX A—DATA ON FEDERAL-AID REIMBURSED PUBLIC UTILITY RELOCATION COSTS

TABLE 8.—Cost of all Federal-aid highway projects, cost of such projects involving federally reimbursed public utility relocation, and cost of utility relocation, by States, July 1, 1949, to June 30, 1954¹

Jurisdiction	All Federal-aid highway projects		Federal-aid highway projects involving public utility relocation			
	Total cost	Federal share	Cost of highway projects		Cost of public utility relocation	
			Total	Federal share	Total	Federal share
Alabama.....	\$78,942,147	\$39,781,368	\$16,398,699	\$7,822,981	\$81,267	\$6,768
Arizona.....	42,269,252	29,075,012	1,776,499	1,212,181	13,488	429
Arkansas.....	65,502,066	33,985,163	20,144,485	10,120,826	180,886	84,920
California.....	223,946,064	109,987,753	3,358,632	1,593,500	13,000	.....
Colorado.....	66,907,472	36,873,779	22,325,180	11,882,187	166,648	77,682
Connecticut.....	36,928,779	18,941,721	.....	.....	.....	.....
Delaware.....	18,523,816	9,129,530	1,229,067	582,230	38,449	2,504
Florida.....	63,152,937	31,773,464	758,941	615,107	1,529	765
Georgia.....	108,298,148	51,714,029	34,957,804	16,047,826	235,555	14,339
Idaho.....	35,677,690	22,080,511	693,974	429,064	5,570	3,485
Illinois.....	204,837,575	103,715,228	16,401,368	8,041,304	95,636	7,130
Indiana.....	81,403,097	42,537,021	.....	.....	.....	.....
Iowa.....	107,485,729	54,423,154	3,996,433	2,070,622	50,055	22,256
Kansas.....	103,722,742	52,119,362	16,805,005	8,080,309	237,478	33,552
Kentucky.....	75,290,488	38,282,650	.....	.....	.....	.....
Louisiana.....	77,841,414	38,309,668	1,137,199	532,925	3,953	654
Maine.....	37,169,786	18,482,316	.....	.....	.....	.....
Maryland.....	39,605,777	20,130,001	.....	.....	.....	.....
Massachusetts.....	106,523,184	51,398,400	.....	.....	.....	.....
Michigan.....	164,339,593	71,974,595	11,039,206	5,170,538	118,719	57,744
Minnesota.....	106,879,363	56,243,416	3,602,571	1,909,836	43,410	11,745
Mississippi.....	70,322,890	35,948,722	1,993,992	1,091,831	26,340	17,640
Missouri.....	127,768,412	65,181,314	8,254,378	4,419,651	91,567	35,567
Montana.....	54,845,482	33,253,794	12,362,488	7,199,696	129,796	50,614
Nebraska.....	55,291,294	29,191,328	9,595,590	4,886,505	63,289	29,577
Nevada.....	25,189,841	20,591,712	1,021,321	851,407	15,254	12,771
New Hampshire.....	19,015,533	9,688,950	1,380,622	760,971	25,176	11,092
New Jersey.....	90,568,783	42,731,202	.....	.....	.....	.....
New Mexico.....	54,157,195	34,402,965	17,368,150	11,012,448	167,817	59,111
New York.....	276,396,498	130,057,175	567,550	252,243	9,000	4,590
North Carolina.....	97,636,216	46,715,893	8,378,248	4,339,815	78,500	35,742
North Dakota.....	64,436,913	32,234,574	3,068,005	1,567,846	28,387	12,334
Ohio.....	200,176,911	98,989,670	.....	.....	.....	.....
Oklahoma.....	90,809,224	46,253,361	.....	.....	.....	.....
Oregon.....	66,222,271	37,490,273	.....	.....	.....	.....
Pennsylvania.....	214,798,535	106,246,493	.....	.....	.....	.....
Rhode Island.....	28,492,856	14,740,139	.....	.....	.....	.....
South Carolina.....	48,324,226	24,662,767	.....	.....	.....	.....
South Dakota.....	56,543,916	33,084,030	2,887,694	1,691,489	31,232	16,351
Tennessee.....	92,935,930	43,355,071	1,627,381	950,557	7,545	3,772
Texas.....	263,767,244	134,232,694	.....	.....	.....	.....
Utah.....	31,239,605	23,313,138	2,376,938	1,575,573	40,453	15,387
Vermont.....	17,078,766	8,875,773	.....	.....	.....	.....
Virginia.....	92,499,530	45,088,730	1,296,966	562,838	699	349
Washington.....	72,806,325	35,973,282	.....	.....	.....	.....
West Virginia.....	39,139,375	19,558,930	.....	.....	.....	.....
Wisconsin.....	124,407,065	60,992,825	.....	.....	.....	.....
Wyoming.....	36,543,510	23,616,072	4,052,682	2,540,085	44,941	21,242
District of Columbia.....	14,260,577	6,995,623	.....	.....	.....	.....
Hawaii.....	26,527,192	11,634,223	664,897	257,630	1,726	863
Puerto Rico.....	22,348,175	10,053,160	.....	.....	.....	.....
Total.....	4,320,567,319	2,195,882,054	231,512,025	120,072,041	2,047,365	650,885

¹ The data include primary, secondary, and urban funds.

Source: Bureau of Public Roads.

TABLE 9.—Cost of Federal-aid highway projects involving federally reimbursed public utility relocation and cost of utility relocation, by type of Federal-aid highway fund and location of facilities, July 1, 1949, to June 30, 1954

Type of Federal-aid highway funds and location of facilities	Cost of highway projects involving public utility relocation							
	5-year total				Annual average			
	Total cost		Federal share		Total cost		Federal share	
	Cost	Distribution	Cost	Distribution	Cost	Distribution	Cost	Distribution
Primary:		Percent		Percent		Percent		Percent
Urban.....	\$23,078,333	9.9	\$11,831,812	9.9	\$4,615,666	9.9	\$2,366,362	9.9
Rural.....	106,243,552	45.9	56,228,745	46.8	21,248,711	46.9	11,245,749	46.8
Total.....	129,321,885	55.8	68,060,557	56.7	25,864,377	55.8	13,612,111	56.7
Secondary:								
Urban.....	71,607,536	31.0	36,383,828	30.3	14,339,507	31.0	7,276,766	30.3
Total.....	30,492,604	13.2	15,627,656	13.0	6,098,521	13.2	3,125,531	13.0
Total.....	231,512,025	100.0	120,072,041	100.0	46,302,406	100.0	24,014,408	100.0

Type of Federal-aid highway funds and location of facilities	Public utility relocation cost							
	5-year total				Annual average			
	Total cost		Federal share		Total cost		Federal share	
	Cost	Distribution	Cost	Distribution	Cost	Distribution	Cost	Distribution
Primary:		Percent		Percent		Percent		Percent
Urban.....	\$258,320	12.6	\$72,304	11.1	\$51,664	12.6	\$14,461	11.1
Rural.....	924,404	45.2	294,911	45.3	184,881	45.2	58,982	45.3
Total.....	1,182,724	57.8	367,215	56.4	236,545	57.8	73,443	56.4
Secondary:								
Urban.....	519,082	25.3	148,105	22.8	103,816	25.3	29,621	22.8
Total.....	345,559	16.9	135,565	20.8	69,112	16.9	27,113	20.8
Total.....	2,047,365	100.0	650,885	100.0	499,473	100.0	130,177	100.0

Source: Bureau of Public Roads.

TABLE 10.—An analysis of public expenditures for federally reimbursed public utility relocation on Federal-aid highways, July 1, 1953, to June 30, 1954

Type of Federal-aid highway	Type of public utility											
	Water and sewer ¹			Gas ¹			Other pipeline ²		Telephone and telegraph			
	Public	Private	Total	Public	Private	Total	Public	Total	Public	Private	Co-op	Total
Primary:												
Urban:												
Utility relocation cost:												
Total cost reported.....	\$3,072	\$1,010	\$4,082						\$8,346	\$54,144		\$62,490
Federal share.....		404	404						4,024	9,629		14,253
Cost of affected highway projects:												
Total cost.....	318,601	356,212	674,813						882,378	4,349,145		5,231,523
Federal share.....	153,829	175,502	329,331						484,815	2,347,076		2,831,891
Rural:												
Utility relocation cost:												
Total cost reported.....		82	82	\$1,788	\$70,189	\$71,977			12,457	80,160		92,617
Federal share.....				421	15,558	15,979			6,693	33,198		39,891
Cost of affected highway projects:												
Total cost.....				396,674	2,652,306	3,048,980			504,117	7,087,525		7,591,642
Federal share.....				250,471	1,438,841	1,689,312			266,939	3,714,165		3,981,104
Totals:												
Utility relocation cost:												
Total cost reported.....	3,072	1,092	4,164	1,788	70,189	71,977			20,803	134,304		155,107
Federal share.....		404	404	421	15,558	15,979			11,317	42,827		54,144
Cost of affected highway projects:												
Total cost.....	318,601	356,212	674,813	396,674	2,652,306	3,048,980			1,386,495	11,436,670		12,823,165
Federal share.....	153,829	175,502	329,331	250,471	1,438,841	1,689,312			751,754	6,061,241		6,812,995
Secondary, rural:												
Utility relocation cost:												
Total cost reported.....					17,034	17,034				32,694	271	32,965
Federal share.....					7,738	7,738				11,646		11,646
Cost of affected highway projects:												
Total cost.....					1,797,142	1,797,142				4,494,777		4,494,777
Federal share.....					1,015,211	1,015,211				2,205,056		2,205,056
Urban, urban:												
Utility relocation cost:												
Total cost reported.....	23,774	4,444	28,218		3,904	3,904	5,180	5,180		14,925		14,925
Federal share.....	10,857	187	11,044				2,326	2,326		6,413		6,413

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Cost of affected highway projects:												
Total cost.....	3,403,428		3,403,428		1,034,884	1,034,884	2,441,191	2,441,191		2,808,006		2,808,006
Federal share.....	1,591,147		1,591,147		510,028	510,028	1,189,751	1,189,751		1,563,919		1,563,919
Grand totals:												
Utility relocation cost:												
Total cost reported.....	26,846	5,536	32,382	1,788	91,127	92,915	5,180	5,180	20,803	181,923	271	202,997
Federal share.....	10,857	591	11,448	421	23,296	23,717	2,326	2,326	11,317	60,886		72,203
Cost of affected highway projects:												
Total cost.....	3,722,029	356,212	4,078,241	396,674	5,484,332	5,881,006	2,441,191	2,441,191	1,386,495	18,739,453		20,125,948
Federal share.....	1,744,976	175,502	1,920,478	250,471	2,964,080	3,214,551	1,189,751	1,189,751	751,754	9,830,216		10,581,970

See footnotes at end of table, p. 29.

TABLE 10.—An analysis of public expenditures for federally reimbursed public utility relocation on Federal-aid highways, July 1, 1953, to June 30, 1954—Continued

Type of Federal-aid highway	Type of public utility									
	Electric and power				Other ¹		Totals			
	Public	Private	Co-op	Total	Public	Total	Public	Private	Co-op	Total
Primary:										
Urban:										
Utility relocation cost:										
Total cost reported.....	\$826	\$20,795	\$872	\$22,493			\$12,244	\$75,949	\$872	\$89,065
Federal share.....		2,271	306	2,577			4,624	12,304	306	17,234
Cost of affected highway projects:										
Total cost.....		889,388	393,833	1,283,221			1,200,979	5,594,745	393,833	7,189,557
Federal share.....		410,477	194,801	605,278			638,644	2,933,055	194,801	3,766,500
Rural:										
Utility relocation cost:										
Total cost reported.....	31,884	87,250	19,462	138,596			46,129	237,681	19,462	303,272
Federal share.....	13,124	19,590	8,236	40,950			20,238	68,346	8,236	96,820
Cost of affected highway projects:										
Total cost.....	4,369,038	14,808,891	4,998,692	24,176,621			5,269,829	24,548,722	4,998,692	34,817,243
Federal share.....	2,212,712	7,381,541	2,658,128	12,252,381			2,730,122	12,534,547	2,658,128	17,922,797
Totals:										
Utility relocation cost:										
Total cost reported.....	32,710	108,045	20,334	161,089			58,373	313,630	20,334	392,337
Federal share.....	13,124	21,861	8,542	43,527			24,862	80,650	8,542	114,054
Cost of affected highway projects:										
Total cost.....	4,369,038	15,698,279	5,392,525	25,459,842			6,470,808	30,143,467	5,392,525	42,006,800
Federal share.....	2,212,712	7,792,018	2,852,929	12,857,659			3,368,766	15,467,602	2,852,929	21,689,297
Secondary, rural:										
Utility relocation cost:										
Total cost reported.....	3,851	73,452	46,542	123,845			3,851	123,180	46,813	173,844
Federal share.....	1,064	17,732	18,370	37,166			1,064	37,116	18,370	56,550
Cost of affected highway projects:										
Total cost.....	807,032	8,892,993	5,935,424	15,635,449			807,032	15,184,912	5,935,424	21,927,368
Federal share.....	378,692	4,318,098	3,039,273	7,136,063			378,692	7,538,365	3,039,273	10,956,330
Urban, urban:										
Utility relocation cost:										
Total cost reported.....	4,746	18,534		23,280	\$10,324	\$10,324	44,024	41,807		85,831
Federal share.....	2,419	6,504		8,923	6,431	6,431	22,033	13,104		35,137
Cost of affected highway projects:										
Total cost.....	889,658	1,774,132		2,663,790	546,172	546,172	7,280,449	5,617,022		12,897,471
Federal share.....	530,802	1,067,604		1,598,406	344,378	344,378	3,666,078	3,141,551		6,797,629
Grand totals:										
Utility relocation cost:										
Total cost reported.....	41,307	200,031	66,876	308,214	10,324	10,324	106,248	478,617	67,147	652,012
Federal share.....	16,607	46,097	26,912	89,616	6,431	6,431	47,959	130,870	26,912	205,741
Cost of affected highway projects:										
Total cost.....	6,065,728	26,365,404	11,327,949	43,759,081	546,172	546,172	14,558,289	50,945,401	11,327,949	76,831,639
Federal share.....	3,122,206	13,177,720	5,892,202	22,192,128	344,378	344,378	7,403,536	26,147,518	5,892,202	39,443,256

¹ No cooperatively owned public utilities are here involved.
² No privately or cooperatively owned public utilities are here involved.

Source: Bureau of Public Roads.

TABLE 11.—Cost of Federal-aid highway projects involving federally reimbursed public utility relocation and cost of utility relocation, by utility type and ownership, July 1, 1949, to June 30, 1954¹

Utility type and ownership	Cost of highway projects involving public utility relocation				Public utility relocation cost			
	Total		Federal share		Total		Federal share	
	Cost	Distribution	Cost	Distribution	Cost	Distribution	Cost	Distribution
Water and sewer:								
Public.....	\$15,700,623	90.5	\$7,819,297	90.6	\$218,978	94.6	\$75,037	96.2
Private.....	1,640,084	9.5	809,502	9.4	12,388	5.4	2,883	3.8
Cooperative.....								
Total.....	17,340,707	100.0	8,628,799	100.0	231,366	100.0	78,920	100.0
Gas:								
Public.....	928,490	5.8	505,556	6.1	21,502	6.6	4,728	4.5
Private.....	15,181,173	94.2	7,831,037	93.9	304,159	93.0	99,412	95.5
Cooperative.....					1,450	.4		
Total.....	16,109,663	100.0	8,336,593	100.0	327,111	100.0	104,140	100.0
Wet gas, oil pipelines:								
Public.....	3,186,596	54.3	1,543,466	54.8	5,902	22.4	2,637	25.2
Private.....	2,351,601	40.0	1,113,408	39.5	20,231	76.9	7,745	74.0
Cooperative.....	335,791	5.7	160,097	5.7	177	.7	88	.8
Total.....	5,873,988	100.0	2,816,971	100.0	26,310	100.0	10,470	100.0
Telephone and telegraph:								
Public.....	2,226,155	3.6	1,135,328	3.3	23,077	3.8	11,766	5.8
Private.....	60,101,523	96.1	33,122,169	96.4	590,368	95.8	189,479	93.5
Cooperative.....	181,948	.3	115,012	.3	2,628	.4	1,494	.7
Total.....	62,509,626	100.0	34,372,509	100.0	616,073	100.0	202,739	100.0
Electric Power:								
Public.....	13,556,232	10.5	6,786,862	10.4	66,402	8.1	26,433	10.9
Private.....	83,708,855	65.1	42,665,411	65.3	599,175	72.8	160,386	66.4
Cooperative.....	31,374,280	24.4	15,888,391	24.3	157,513	19.1	54,926	22.7
Total.....	128,639,367	100.0	65,340,664	100.0	823,090	100.0	241,745	100.0
Miscellaneous utilities:²								
Public.....	644,639	62.1	387,405	67.2	23,398	99.9	12,871	100.0
Private.....	394,035	37.9	189,100	32.8	17	.1		
Cooperative.....								
Total.....	1,038,674	100.0	576,505	100.0	23,415	100.0	12,871	100.0
Summary, utility type:								
Water and sewer.....	17,340,707	7.5	8,628,799	7.2	231,366	11.3	78,920	12.1
Gas.....	16,109,663	7.0	8,336,593	6.9	327,111	16.0	104,140	16.0
Wet gas, oil pipelines.....	5,873,988	2.5	2,816,971	2.4	26,310	1.3	10,470	1.6
Telephone and telegraph.....	62,509,626	27.0	34,372,509	28.6	616,073	30.1	202,739	31.2
Electric and power.....	128,639,367	55.6	65,340,664	54.4	823,090	40.2	241,745	37.1
Miscellaneous utilities.....	1,038,674	.4	576,505	.5	23,415	1.1	12,871	2.0
Total.....	231,512,025	100.0	120,072,041	100.0	2,047,365	100.0	650,885	100.0
Summary, ownership type:								
Public.....	36,242,735	15.6	18,177,914	15.1	359,259	17.5	134,372	20.6
Private.....	163,377,271	70.6	85,730,627	71.4	1,526,338	74.6	460,005	70.7
Cooperative.....	31,892,019	13.8	16,163,500	13.5	161,768	7.9	56,508	8.7
Total.....	231,512,025	100.0	120,072,041	100.0	2,047,365	100.0	650,885	100.0

¹ The data include primary, secondary, and urban projects.

² Police, fire alarm boxes, and lighting.

Source: Bureau of Public Roads.

TABLE 12.—Summary of cost of federally reimbursed public utility relocation incident to Federal-aid highway projects, by type of utility, July 1, 1953, to June 30, 1954

Type of utility	Cost of utility relocation		Cost of Federal-aid highway projects involving utility relocation	
	Total	Federal share	Total	Federal share
Water and sewer.....	\$32,382	\$11,448	\$4,078,241	\$1,920,478
Gas.....	92,915	23,717	5,881,006	3,214,551
Other pipeline.....	5,180	2,326	2,441,191	1,189,751
Telephone and telegraph.....	202,997	72,203	20,125,948	10,681,970
Electric and power.....	308,214	89,616	43,759,081	22,192,128
Miscellaneous.....	10,324	6,431	546,172	344,378
Total.....	652,012	205,741	76,831,639	39,443,256

Source: Bureau of Public Roads.

TABLE 13.—Summary of cost of federally reimbursed public utility relocation incident to Federal-aid highway projects, by utility ownership type, July 1, 1949, to June 30, 1954

Utility ownership type	Utility relocation cost				Cost of Federal-aid highway project involving utility relocation	
	Total		Federal share		Total	Federal share
	Cost	Distribution	Cost	Distribution		
Publicly owned.....	\$359,259	Percent 17.5	\$134,372	Percent 20.6	\$36,242,735	\$18,177,914
Privately owned.....	1,526,338	74.6	460,005	70.7	163,377,271	85,730,627
Cooperatively owned.....	161,768	7.9	56,508	8.7	31,892,019	16,163,500
Total.....	2,047,365	100.0	650,885	100.0	231,512,025	120,072,041

Source: Bureau of Public Roads.

APPENDIX B—DATA ON STATE EXPENDITURES FOR PUBLIC UTILITY RELOCATION

TABLE 14.—Relation of State expenditures for public utility relocation to cost of highway improvements involving such utility relocation and to cost of all highway improvements, by States, 1953

State	State expenditures for public utility relocation	Cost of highway improvements involving reimbursements for utility relocation	Cost of all highway improvements	Expenditure for utility relocation per dollar of cost of highway improvements involving reimbursements for utility relocation	Expenditure for utility relocation per dollar of cost of all highway improvements
	Dollars	Thousands of Dollars	Thousands of Dollars	Cents	Cents
Alabama.....	80,870	9,286.5	23,888.6	0.87	0.34
Arizona.....	35,309	4,141.9	19,538.3	.85	.18
Arkansas.....	165,994	18,547.6	32,908.4	.89	.50
California.....	4,728,135	125,881.5	149,379.5	3.76	3.17
Colorado.....	58,303	7,732.6	19,314.4	.75	.30
Connecticut.....	47,205	4,207.8	17,360.8	1.12	.27
Delaware.....	41,260	4,847.5	9,912.8	.85	.42
Florida.....	(1)	(1)	48,003.0		
Georgia.....	44,662	8,281.7	20,994.6	.64	.21
Idaho.....	18,330	1,488.2	11,321.6	1.23	.16
Illinois.....	456,415	27,031.3	83,591.2	1.69	.55
Indiana.....	0	0	29,019.4		
Iowa.....	29,856	11,565.6	23,250.6	.26	.13
Kansas.....	220,895	11,529.1	21,811.6	1.92	1.01
Kentucky.....	184,890	5,166.8	43,367.3	3.58	.43
Louisiana.....	101,352	6,476.9	27,185.6	1.56	.37
Maine.....	0	0	10,885.7		
Maryland.....	228,495	18,476.6	32,207.9	1.24	.71
Massachusetts.....	1,247,020	30,883.9	44,426.5	4.04	2.81
Michigan.....	1,517,262	14,460.5	66,377.7	10.49	2.29
Minnesota.....	330,812	15,138.7	68,805.3	2.18	.48
Mississippi.....	56,869	9,026.5	22,694.0	.63	.25
Missouri.....	29,142	3,969.4	31,511.3	.73	.09
Montana.....	37,077	6,291.2	10,377.1	.59	.36
Nebraska.....	53,068	9,055.6	21,735.8	.59	.24
Nevada.....	3,837	607.9	5,500.4	.63	.07
New Hampshire.....	21,031	1,828.5	6,960.5	1.15	.30
New Jersey.....	758,998	23,786.0	37,265.3	3.19	2.04
New Mexico.....	129,984	5,809.6	16,187.4	2.24	.80
New York.....	1,835,663	78,278.0	71,646.2	2.85	2.56
North Carolina.....	251,726	18,528.7	35,710.6	1.36	.71
North Dakota.....	52,750	7,334.2	21,234.3	.72	.25
Ohio.....	127,083	18,039.5	66,616.9	.71	.19
Oklahoma.....	257,289	17,763.8	37,184.4	1.45	.69
Oregon.....	63,149	13,054.8	31,058.4	.48	.20
Pennsylvania.....	804,629	83,913.1	111,435.0	.96	.72
Rhode Island.....	342,163	9,812.0	13,134.6	3.49	2.61
South Carolina.....	84,152	11,762.3	17,454.5	.72	.48
South Dakota.....	8,259	1,039.8	7,237.1	.79	.11
Tennessee.....	0	0	24,464.9		
Texas.....	(2)	(2)	101,103.7		
Utah.....	11,040	3,409.4	9,648.5	.32	.11
Vermont.....	1,977	379.6	3,088.2	.52	.07
Virginia.....	360,399	26,627.0	29,755.0	1.39	1.24
Washington.....	769,850	17,463.3	41,731.6	4.41	1.84
West Virginia.....	143,037	6,116.9	17,213.3	2.34	.83
Wisconsin.....	11,373	4,230.9	46,589.1	.27	.02
Wyoming.....	23,073	1,318.3	6,463.7	1.75	.36
District of Columbia.....	26,808	1,557.5	2,233.2	1.72	1.20
Hawaii.....	137,856	2,596.0	10,688.7	5.31	1.29
Puerto Rico.....	37,803	3,520.4	6,072.4	1.07	.62
Total.....	15,986,750	712,333.9	1,668,134.9	2.24	.96

1 Not available.

2 Rights-of-way are furnished to State by counties and cities without cost to State.

Source: State highway departments.

TABLE 15.—Summary of highway expenditures for utility relocation incident to highway improvements and relation of such expenditures to highway costs, by years, 1949-53

Year	State expenditures for utility relocation	Cost of highway improvements involving reimbursements for utility relocation	Cost of all highway improvements	Amount of utility reimbursement per dollar of cost of highway improvements involving reimbursed utility relocation	Amount of utility reimbursement per dollar of cost of all highway improvements	Amount spent for highway improvements involving reimbursed utility relocation per dollar of utility reimbursement	Amount spent for all highway improvements per dollar of utility reimbursement
	Dollars	Thousands of dollars	Thousands of dollars	Cents	Cents	Dollars	Dollars
1949.....	5,966,911	385,940.0	1,139,469	1.55	0.52	64.68	190.89
1950.....	7,455,956	433,641.4	1,308,561	1.72	.57	58.16	175.51
1951.....	11,082,897	490,352.8	1,474,632	2.38	.79	41.97	126.22
1952.....	11,020,190	572,678.8	1,599,739	1.92	.68	51.97	145.16
1953.....	15,986,750	712,333.9	1,668,135	2.24	.96	44.56	104.34
Total.....	52,112,704	2,594,946.9	7,190,536	2.01	.72	49.79	137.98

1 Obtained from Bureau of Public Roads Highway Statistics for the respective years. All other data were obtained from the current survey.

Source: State highway departments.

TABLE 16.—Total State highway expenditures for public utility relocation and total cost of highway improvements involving such utility relocation, by project location and type of highway

Type of highway	Urban				Rural				Total			
	State expenditure for public utility relocation		Cost of highway improvements involving utility relocation		State expenditure for public utility relocation		Cost of highway improvements involving utility relocation		State expenditure for public utility relocation		Cost of highway improvements involving utility relocation	
	Amount	Distribution	Amount	Distribution	Amount	Distribution	Amount	Distribution	Amount	Distribution	Amount	Distribution
Expressway.....	\$6,086,368	63.3	\$133,497,779	51.5	\$1,872,157	29.4	\$85,808,294	18.9	\$7,958,525	49.8	\$219,305,073	30.8
Divided highway other than expressway.....	1,856,265	19.3	81,744,739	31.5	476,293	7.5	48,817,947	10.8	2,332,558	14.6	130,562,686	18.3
Undivided highway other than expressway.....	1,672,533	17.4	43,965,281	17.0	4,023,134	63.1	318,499,903	70.3	5,695,667	35.6	362,465,184	50.9
Total.....	9,615,166	100.0	259,207,799	100.0	6,371,584	100.0	453,126,144	100.0	15,986,750	100.0	712,333,943	100.0

Source: State highway departments.

TABLE 17.—State highway expenditure for public utility relocation, by project location and type of utility, 1953

Type of utility	Project location					
	Urban		Rural		Total	
	Amount	Percent	Amount	Percent	Amount	Percent
Water.....	\$3,040,790	31.6	\$499,018	7.8	\$3,539,808	22.1
Sewer.....	1,993,023	19.8	1,197,216	18.8	3,190,239	19.4
Gas.....	330,302	3.6	777,203	12.2	1,107,505	7.0
Other pipeline.....	130,833	1.3	231,793	3.6	362,626	2.2
Telephone.....	487,829	5.1	1,106,472	17.4	1,594,301	10.0
Telegraph.....	20,601	.2	68,306	1.1	88,907	.6
Electric and power.....	2,333,066	24.3	1,959,275	30.9	4,292,341	26.9
Transit.....	980,973	10.2	116,853	1.8	1,097,826	6.9
Miscellaneous.....	377,069	3.9	400,389	6.4	783,458	4.9
Total.....	9,615,166	100.0	6,371,684	100.0	15,986,750	100.0

Source: State highway departments.

TABLE 18.—State highway expenditures for public utility relocation and cost of highway improvements involving such utility relocations, by location and type of utility, 1953

Type of utility	Urban		Rural		Total	
	State expenditure for public utility relocation	Cost of highway improvement involving utility relocation	State expenditure for public utility relocation	Cost of highway improvement involving utility relocation	State expenditure for public utility relocation	Cost of highway improvement involving utility relocation
Water:						
Publicly owned.....	\$2,698,174	\$136,302,747	\$402,013	\$53,735,887	\$3,100,187	\$190,038,634
Privately owned.....	341,816	21,083,640	86,410	32,774,932	428,226	53,858,592
Cooperatively owned.....	800	800	10,595	1,034,181	11,395	1,034,981
Total.....	3,040,790	157,387,187	499,018	87,545,020	3,539,808	244,032,207
Sewer:						
Publicly owned.....	1,865,281	75,734,534	1,192,399	27,520,936	3,057,680	103,255,470
Privately owned.....	37,684	1,083,800	4,817	1,720,157	42,501	2,803,957
Cooperatively owned.....	58	93,000			58	93,000
Total.....	1,903,023	76,911,334	1,197,216	29,241,093	3,100,239	106,152,427
Gas:						
Publicly owned.....			67,144	4,378,374	67,144	4,378,374
Privately owned.....	350,362	73,061,163	710,059	82,585,956	1,060,421	155,647,119
Cooperatively owned.....						
Total.....	350,362	73,061,163	777,203	86,964,330	1,127,565	160,025,493
Other pipe line:						
Publicly owned.....			5,947	646,899	5,947	646,899
Privately owned.....	120,833	2,466,663	223,494	20,056,098	344,347	31,522,761
Cooperatively owned.....			2,321	12,359	2,321	12,359
Total.....	120,833	2,466,663	231,762	20,715,356	352,615	32,182,019
Telephone:						
Publicly owned.....			11,891	3,831,170	11,891	3,831,170
Privately owned.....	487,829	104,121,991	1,091,537	184,304,881	1,579,366	288,429,872
Cooperatively owned.....			3,044	1,446,864	3,044	1,446,864
Total.....	487,829	104,121,991	1,106,472	189,582,915	1,594,301	293,704,906
Telegraph:						
Publicly owned.....			1,767	3,229,265	1,767	3,229,265
Privately owned.....	20,601	12,031,819	62,543	40,484,317	83,144	52,516,136
Cooperatively owned.....			4,056	434,600	4,056	434,600
Total.....	20,601	12,031,819	68,366	44,148,182	88,967	56,180,001
Electric and power:						
Publicly owned.....	943,832	50,385,171	162,538	34,302,889	1,106,370	84,688,060
Privately owned.....	1,386,924	101,946,475	1,376,899	220,452,105	2,763,823	322,398,580
Cooperatively owned.....	2,310	1,164,968	429,838	97,901,631	432,148	99,056,599
Total.....	2,333,066	153,496,614	1,969,275	352,656,625	4,302,341	506,143,239
Transit:						
Publicly owned.....	21,437	14,468,655	1,900	1,900	23,337	14,470,555
Privately owned.....	959,536	7,980,526	114,450	6,883,469	1,073,986	14,863,995
Cooperatively owned.....			533	1,156,988	533	1,156,988
Total.....	980,973	22,449,181	116,883	8,042,357	1,097,856	30,491,538
Miscellaneous utilities:						
Publicly owned.....	369,347	40,867,177	202,203	17,217,712	571,550	67,084,889
Privately owned.....	2,722	7,365,313	5,286	1,116,895	8,008	8,482,208
Cooperatively owned.....	5,600	407,600	197,900	2,801,300	203,500	3,208,900
Total.....	377,669	57,640,090	405,389	21,135,907	783,058	78,775,997
Total, all utilities:						
Publicly owned.....	5,898,071	(¹)	2,047,802	(¹)	7,945,873	(¹)
Privately owned.....	3,708,327	(¹)	3,675,495	(¹)	7,383,822	(¹)
Cooperatively owned.....	8,768	(¹)	648,287	(¹)	657,055	(¹)
Grand total all utilities.....	9,615,166	259,207,799	6,371,584	463,126,144	15,986,750	712,333,943

¹ Costs of highway improvements are often duplicated and are, therefore, nonadditive, because of the location of more than one utility on the same sections of highway.

Source: State highway departments.

TABLE 19.—State highway expenditure for public utility relocation, by project location and utility ownership, 1953

Utility ownership	Project location				Total	
	Urban		Rural		Amount	Percent
	Amount	Percent	Amount	Percent		
Publicly owned.....	\$5,898,071	61.3	\$2,047,802	32.1	\$7,945,873	49.7
Privately owned.....	3,708,327	38.6	3,675,495	57.7	7,383,822	46.2
Cooperatively owned.....	8,768	.1	648,287	10.2	657,055	4.1
Total.....	9,615,166	100.0	6,371,584	100.0	15,986,750	100.0

Source: State highway departments.

APPENDIX C—DATA ON PUBLIC UTILITY RELOCATION COSTS

TABLE 20.—Public utility relocation costs related to highway expenditures and mileages, classified by States, 1953

State	All highways constructed by State			Highway projects involving public utility relocation			Public utility relocation		Public utility relocation costs—			
	Cost	Federal-aid funds	Mileage	Cost	Federal-aid funds	Mileage	Cost ¹	Reimbursement	Per dollar of all highway improvements	Per dollar of highway projects involving utility relocation	Per mile of all highway improvements	Per mile of highway projects involving utility relocation
									Cents	Cents		
Alabama.....	\$23,888,613	\$9,532,132	985	\$15,577,519	\$6,531,604	434	\$490,743	\$113,910	2.1	3.2	\$498	\$1,131
Arizona.....	19,538,247	7,519,212	461	9,297,186	4,267,132	97	150,799	51,801	.8	1.6	327	1,555
Arkansas.....	32,908,392	12,770,793	1,287	18,251,908	7,465,121	526	459,717	72,886	1.4	2.5	357	874
California.....	149,379,518	34,081,698	715	127,394,461	31,194,002	364	4,990,113	2,297,491	3.3	3.9	6,992	13,734
Colorado.....	19,314,404	8,097,289	1,428	7,277,661	3,094,951	130	395,655	62,710	2.0	5.4	277	3,044
Connecticut.....	17,360,815	3,629,285	56	15,016,121	3,629,285	48	537,236	45,373	3.1	3.4	9,594	11,192
Delaware.....	9,912,743	2,624,259	54	9,237,556	2,624,259	48	251,565	38,632	2.5	2.7	4,659	4,659
Florida.....	48,602,986	7,866,334	855	29,005,471	5,212,998	328	669,916	125,305	1.4	2.3	784	2,042
Georgia.....	20,994,604	5,189,933	1,720	8,487,852	2,575,083	433	120,963	63,635	.6	1.4	70	279
Idaho.....	11,321,625	7,738,144	242	7,941,197	5,683,326	109	132,771	33,692	1.2	1.7	549	1,218
Illinois.....	83,591,200	26,399,371	1,756	46,327,798	16,310,584	585	1,804,570	216,811	2.2	3.9	1,028	3,085
Indiana.....	29,019,393	10,388,018	732	15,009,501	6,707,275	158	395,356	53,383	1.4	2.6	540	2,502
Iowa.....	23,259,631	5,461,553	1,340	8,242,343	2,210,834	148	234,722	5,706	1.0	2.8	175	1,586
Kansas.....	21,811,622	8,958,602	673	11,588,718	5,171,878	290	334,331	79,724	1.5	2.9	497	1,286
Kentucky.....	43,367,331	7,405,802	2,518	14,383,614	3,914,452	428	460,954	54,975	1.1	3.2	183	1,077
Louisiana.....	27,185,591	6,454,715	461	10,227,546	2,795,880	153	298,621	73,520	1.1	2.9	648	1,952
Maine.....	10,895,642	2,374,071	315	5,463,565	1,810,003	100	284,070	5,026	2.6	5.2	902	2,841
Maryland.....	32,207,885	2,939,077	157	22,623,196	2,743,244	125	768,641	56,209	2.4	3.4	4,896	6,149
Massachusetts.....	44,425,450	5,535,700	104	40,690,860	5,181,600	75	1,654,491	899,408	3.7	4.1	15,909	23,660
Michigan.....	66,377,722	18,169,825	757	46,719,128	14,721,977	338	1,624,539	212,370	2.4	3.5	2,146	4,806
Minnesota.....	68,805,296	18,511,213	3,130	32,440,455	8,430,516	1,143	727,080	52,865	1.1	2.2	232	636
Mississippi.....	22,694,012	8,930,701	910	12,165,638	5,343,721	442	154,355	62,928	.7	1.3	170	349
Missouri.....	31,511,303	11,944,911	1,829	11,967,734	6,388,905	322	416,007	27,520	1.3	3.5	227	1,292
Montana.....	10,377,094	6,187,335	300	7,332,104	4,389,074	166	114,009	28,384	1.1	1.6	380	687
Nebraska.....	21,755,755	10,616,157	672	10,879,628	5,549,316	292	135,772	28,596	.6	1.2	202	465
Nevada.....	5,500,349	4,262,985	198	1,135,428	852,767	9	19,116	2,808	.3	1.7	97	2,124
New Hampshire.....	6,960,516	2,139,175	68	6,636,111	2,099,939	65	284,794	14,735	4.1	4.3	4,188	4,381
New Jersey.....	37,263,331	13,146,702	87	31,210,759	10,718,610	82	1,496,743	798,875	4.0	4.8	17,204	18,253
New Mexico.....	16,187,363	7,946,539	808	6,282,180	3,619,899	173	79,436	21,565	.5	1.3	98	459
New York.....	71,646,240	22,390,478	503	66,407,411	21,364,742	356	1,730,300	88,734	2.4	2.6	3,440	4,990
North Carolina.....	35,710,617	9,495,391	928	23,851,469	7,877,772	388	468,699	229,029	1.3	2.0	505	1,208
North Dakota.....	21,234,259	10,091,936	2,108	7,697,436	3,731,069	412	352,314	92,149	1.7	4.6	167	855
Ohio.....	66,616,924	27,050,616	328	60,565,209	24,927,004	297	2,681,863	369,113	4.0	4.4	8,176	9,090
Oklahoma.....	37,184,417	10,583,524	706	31,018,139	8,603,767	556	528,721	166,366	1.4	1.7	749	951
Oregon.....	31,058,404	13,925,183	451	21,536,771	9,920,960	197	418,537	95,359	1.3	1.9	928	2,125
Pennsylvania.....	111,435,030	31,657,376	588	105,760,706	30,342,603	542	4,184,030	841,357	3.8	4.0	7,116	7,720
Rhode Island.....	13,134,600	6,615,297	40	804,084	329,428	6	19,783	.....	.2	2.5	495	3,297
South Carolina.....	17,454,524	6,629,248	910	9,034,413	3,963,685	357	155,872	69,484	.9	1.7	171	437
South Dakota.....	7,237,139	3,475,196	620	916,271	471,219	50	34,466	2,825	.5	3.8	56	689
Tennessee.....	24,464,940	6,310,290	437	17,249,547	5,391,119	230	519,491	12,774	2.1	3.0	1,189	2,259
Texas.....	101,103,683	22,762,697	4,764	49,942,345	13,706,997	1,768	1,881,011	114,351	1.9	3.8	395	1,064
Utah.....	9,648,487	5,502,290	376	4,793,682	2,326,953	78	97,190	5,354	1.0	2.0	298	1,246
Vermont.....	3,038,149	1,483,302	42	2,755,949	1,352,516	37	80,776	2,289	2.7	2.9	1,923	2,183
Virginia.....	29,755,030	10,319,856	577	22,119,349	7,727,400	343	525,336	373,071	1.8	2.4	910	1,532
Washington.....	41,731,616	10,123,300	609	24,021,152	6,927,800	138	254,470	74,864	.6	1.1	418	1,844
West Virginia.....	17,213,317	5,632,710	399	10,123,065	3,831,507	77	463,785	124,142	2.7	4.6	1,162	6,023
Wisconsin.....	46,589,130	15,065,804	605	32,465,841	11,595,856	331	1,071,933	33,559	2.3	3.3	1,772	3,238
Wyoming.....	6,463,671	3,954,020	198	3,703,387	2,442,764	58	155,111	35,096	2.4	4.2	783	2,674
Hawaii.....	10,688,686	4,656,571	71	9,081,119	3,885,393	39	264,522	69,329	2.5	2.9	3,725	6,783
District of Columbia.....	2,233,214	501,607	31	989,505	147,637	9	118,744	653	5.3	12.0	3,830	13,194
Puerto Rico.....	6,072,438	2,049,360	118	3,736,345	1,586,499	12	27,795	27,796	.5	.7	236	2,316
Total and averages.....	1,668,134,948	508,606,583	40,027	1,097,905,824	353,693,525	13,808	35,530,834	8,428,146	2.1	3.2	888	2,502

¹ Cost less betterment.
Source: Public utilities.

TABLE 21.—Relationship of public utility relocation and reimbursement costs to total State highway expenditures, by type of highway and highway systems, 1953

Highway type, location, and system	All highways constructed by State			Utility relocation cost less betterment	Utility reimbursement	Utility relocation cost per dollar of total highway expenditure	Utility relocation cost per mile of highway	Utility reimbursement cost per dollar of total highway expenditure	Utility reimbursement cost per mile of highway
	Total expenditure	Federal-aid funds	Miles of highway						
Federal-aid primary:									
Urban.....	\$382,683,364	\$133,260,695	1,070	\$14,960,499	\$4,204,501	Cents 3.91	\$13,982	Cents 1.10	\$3,929
Expressway.....	203,304,120	69,646,242	192	7,443,240	2,505,053	3.66	38,767	1.23	13,047
Divided highway other than expressway.....	92,795,101	36,490,433	268	4,694,842	1,437,922	5.06	17,518	1.55	5,365
Undivided highway other than expressway.....	86,584,143	27,124,020	610	2,822,417	261,526	3.26	4,627	.30	429
Rural.....	716,741,800	223,492,342	14,794	10,573,697	2,647,808	1.48	715	.37	179
Expressway.....	116,240,766	34,203,780	509	1,945,129	845,232	1.67	3,821	.73	1,661
Divided highway other than expressway.....	78,278,826	32,627,153	657	1,658,378	450,051	2.12	2,524	.57	685
Undivided highway other than expressway.....	522,222,208	156,661,409	13,628	6,970,190	1,352,525	1.33	611	.26	99
Total.....	1,099,425,164	356,753,037	15,864	25,534,196	6,852,309	2.32	1,610	.62	432
Expressway.....	319,544,886	103,850,022	701	9,388,369	3,350,285	2.94	13,393	1.05	4,779
Divided highway other than expressway.....	171,073,927	69,117,586	925	6,353,220	1,887,973	3.71	6,868	1.10	2,041
Undivided highway other than expressway.....	608,806,351	183,785,429	14,238	9,792,607	1,614,051	1.61	688	.27	113
Federal-aid secondary:									
Urban.....	19,025,729	5,011,062	154	886,117	21,045	4.66	5,754	.11	137
Expressway.....	1,671,375	41,426	2	54,545	3,168	3.26	27,272	.19	1,584
Divided highway other than expressway.....	2,568,259	1,088,056	6	303,085	126	15.31	65,514	.00	21
Undivided highway other than expressway.....	14,786,095	3,881,580	146	438,487	17,751	2.97	3,003	.12	122
Rural.....	413,282,181	142,518,606	20,170	5,366,980	891,807	1.30	266	.22	44
Expressway.....	1,914,634	608,541	10	11,199	2,087	.58	1,120	.11	209
Divided highway other than expressway.....	5,447,601	2,814,428	46	174,820	19,419	3.21	3,796	.36	422
Undivided highway other than expressway.....	405,919,946	139,005,637	20,114	5,181,161	870,301	1.28	258	.21	43
Total.....	432,307,910	147,529,668	20,324	6,253,097	912,852	1.45	308	.21	45
Expressway.....	3,586,009	739,967	12	65,744	5,255	1.83	5,479	.15	438
Divided highway other than expressway.....	8,015,860	3,902,484	52	567,705	19,545	7.08	10,917	.24	376
Undivided highway other than expressway.....	420,706,041	142,887,217	20,260	5,619,648	888,052	1.34	277	.21	44
Other State primary:									
Urban.....	21,314,150	456,353	87	645,398	62,293	3.03	7,418	.29	716
Expressway.....	9,731,908	.....	9	139,894	55,334	1.44	15,544	.57	6,148
Divided highway other than expressway.....	4,162,227	.....	5	108,142	1,840	2.60	21,628	.04	368
Undivided highway other than expressway.....	7,420,015	456,353	73	397,362	5,119	5.36	5,443	.07	70
Rural.....	63,855,181	878,267	1,003	2,114,773	346,368	3.31	2,108	.54	345
Expressway.....	8,285,251	.....	18	139,170	82,253	1.68	7,732	.99	4,670
Divided highway other than expressway.....	10,945,654	.....	40	619,676	61,465	5.86	15,492	.56	1,537
Undivided highway other than expressway.....	44,624,276	878,267	945	1,355,927	202,650	3.04	1,435	.45	214
Total.....	85,169,331	1,334,620	1,090	2,760,171	408,661	3.24	2,532	.48	375
Expressway.....	18,017,159	.....	27	279,064	137,587	1.55	10,336	.76	5,096
Divided highway other than expressway.....	15,107,881	.....	45	727,818	63,305	4.82	16,174	.42	1,407
Undivided highway other than expressway.....	52,044,291	1,334,620	1,018	1,753,289	207,769	3.37	1,722	.40	204
Other State secondary:									
Urban.....	12,441,310	114,430	204	485,438	151,721	3.90	2,380	1.22	744
Expressway.....	949,668	.....	3	40,044	.....	4.22	13,348	0	0
Divided highway other than expressway.....	11,491,642	114,430	201	445,394	151,721	3.88	2,216	1.32	6755
Rural.....	38,791,233	2,874,828	2,545	497,931	102,603	1.28	196	.26	40
Expressway.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Divided highway other than expressway.....	38,791,233	2,874,828	2,545	497,931	102,603	1.28	196	.26	40
Undivided highway other than expressway.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	51,232,543	2,989,258	2,749	983,369	254,324	1.92	358	.50	93
Expressway.....	949,668	.....	3	40,044	.....	4.22	13,348	0	0
Divided highway other than expressway.....	50,282,875	2,989,258	2,746	943,325	254,324	1.88	344	.51	93
Undivided highway other than expressway.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All highways.....	1,668,134,948	508,606,583	40,027	35,530,833	8,428,146	2.13	888	.51	211
Type of highway:									
Expressway.....	342,097,722	104,589,989	743	9,773,221	3,493,127	2.86	13,154	1.02	4,701
Divided highway other than expressway.....	194,197,668	73,020,070	1,022	7,648,743	1,970,823	3.94	7,484	1.01	1,928
Undivided highway other than expressway.....	1,131,839,558	330,996,524	38,262	18,108,869	2,964,196	1.60	473	.26	77
Location:									
Urban.....	435,464,553	138,842,540	1,515	16,977,452	4,439,560	3.90	11,206	1.02	2,930
Rural.....	1,232,670,395	369,764,043	38,512	18,553,381	3,988,586	1.51	482	.32	104

Source: Public utilities.

TABLE 22.—Public utility relocation cost and utility reimbursement, by type of highway and project location, 1953: Utility on highway right-of-way

Item	Type of highway			
	Expressway	Divided highway other than expressway	Undivided highway other than expressway	Total
Urban:				
Public utility relocation cost: ¹				
Amount.....	\$5,674,828	\$4,805,265	\$3,745,856	\$15,225,949
Distribution.....percent..	43.8	31.6	24.6	100.0
Utility reimbursement:				
Amount.....	\$1,898,492	\$1,140,814	\$213,418	\$3,252,724
Distribution.....percent..	58.4	35.1	6.5	100.0
Rural:				
Public utility relocation cost: ¹				
Amount.....	\$1,365,459	\$1,787,710	\$10,720,784	\$13,873,953
Distribution.....percent..	9.8	12.9	77.3	100.0
Utility reimbursement:				
Amount.....	\$245,771	\$43,264	\$285,851	\$574,886
Distribution.....percent..	42.8	7.5	49.7	100.0
Total:				
Public utility relocation: ¹				
Amount.....	\$8,040,287	\$6,592,975	\$14,466,640	\$29,099,902
Distribution.....percent..	27.6	22.7	49.7	100.0
Utility reimbursement:				
Amount.....	\$2,144,263	\$1,184,078	\$499,269	\$3,827,610
Distribution.....percent..	56.0	30.9	13.1	100.0

¹ Exclusive of betterment.

Source: Public utilities.

TABLE 23.—Public utility relocation cost and utility reimbursement, and cost and mileage of highway projects involving utility relocation, by project location and by type of highway, 1953

Project location	Type of highway			
	Expressway	Divided highway other than expressway	Undivided highway other than expressway	Total
Urban:				
Public utility relocation cost: ¹				
Amount.....	\$7,677,723	\$5,196,069	\$4,103,660	\$16,977,452
Distribution.....percent..	45.2	30.6	24.2	100.0
Utility reimbursement:				
Amount.....	\$2,563,555	\$1,439,888	\$436,117	\$4,439,560
Distribution.....percent..	57.8	32.4	9.8	100.0
Cost of highway improvements involving utility relocation:				
Amount.....	\$177,798,483	\$90,314,761	\$92,072,344	\$360,185,588
Distribution.....percent..	49.4	25.1	25.5	100.0
Mileage of highway projects involving utility relocation:				
Miles.....	160	173	546	879
Distribution.....percent..	18.2	19.7	62.1	100.0
Rural:				
Public utility relocation cost: ¹				
Amount.....	\$2,095,498	\$2,452,674	\$14,005,209	\$18,553,381
Distribution.....percent..	11.3	13.2	75.5	100.0
Utility reimbursement:				
Amount.....	\$929,572	\$530,935	\$2,528,079	\$3,988,586
Distribution.....percent..	23.3	13.3	63.4	100.0
Cost of highway improvements involving utility relocation:				
Amount.....	\$110,402,402	\$77,369,334	\$549,948,500	\$737,720,236
Distribution.....percent..	15.0	10.5	74.5	100.0
Mileage of highway projects involving utility relocation:				
Miles.....	398	481	12,110	12,989
Distribution.....percent..	3.1	3.7	93.2	100.0
Total:				
Public utility relocation cost: ¹				
Amount.....	\$9,773,221	\$7,648,743	\$18,108,869	\$35,530,833
Distribution.....percent..	27.5	21.5	51.0	100.0
Utility reimbursement:				
Amount.....	\$3,493,127	\$1,970,823	\$2,964,196	\$8,428,146
Distribution.....percent..	41.4	23.4	35.2	100.0
Cost of highway improvements involving utility relocation:				
Amount.....	\$288,200,885	\$167,684,095	\$642,020,844	\$1,097,905,824
Distribution.....percent..	26.2	15.3	58.5	100.0
Mileage of highway projects involving utility relocation:				
Miles.....	558	654	12,656	13,868
Distribution.....percent..	4.0	4.7	91.3	100.0

¹ Exclusive of betterment.

Source: Public utilities.

TABLE 24.—Public utility relocation cost and utility reimbursement, by type of utility right-of-way on which utility was located, and project location, 1953

Utility type	Urban		Rural		Total	
	Utility relocation cost †	Reimbursement	Utility relocation cost †	Reimbursement	Utility relocation cost †	Reimbursement
Water:						
Highway right-of-way.....	\$2,493,350	\$980,310	\$551,446	\$105,836	\$3,044,796	\$975,146
Private right-of-way.....	653,555	519,351	112,816	89,049	766,371	608,400
Total.....	3,146,905	1,398,661	664,262	194,885	3,811,167	1,583,546
Sewer:						
Highway right-of-way.....	473,188	121,776	180,256	1,084	652,444	123,460
Private right-of-way.....	162,803	30,329	14,783	11,389	177,586	41,718
Total.....	635,991	152,105	204,039	13,073	840,030	165,178
Gas:						
Highway right-of-way.....	2,695,234	403,334	1,350,127	78,011	4,045,361	481,345
Private right-of-way.....	277,614	124,927	679,927	371,015	857,541	495,942
Total.....	2,972,848	528,261	1,930,054	449,026	4,902,902	977,287
Other pipeline:						
Highway right-of-way.....	83,064	32,123	160,523	5,502	252,587	37,625
Private right-of-way.....	11,154	11,154	133,982	107,025	145,136	118,179
Total.....	94,218	43,277	303,505	112,527	397,723	155,804
Telephone:						
Highway right-of-way.....	3,502,040	445,143	6,964,741	211,288	10,366,781	656,431
Private right-of-way.....	136,985	97,223	1,312,202	890,791	1,449,187	988,014
Total.....	3,639,025	542,366	8,176,943	1,102,079	11,815,968	1,644,445
Telegraph:						
Highway right-of-way.....	39,055	107	23,944	198	62,999	305
Private right-of-way.....	104,140	98,739	55,555	51,515	159,695	150,254
Total.....	143,195	98,846	79,499	51,713	222,694	150,559
Electric and power:						
Highway right-of-way.....	4,881,709	504,273	4,717,139	172,367	9,598,848	676,640
Private right-of-way.....	363,065	274,919	2,470,163	1,892,916	2,833,228	2,167,835
Total.....	5,244,774	779,192	7,187,302	2,065,283	12,432,076	2,844,475
Transit:						
Highway right-of-way.....	1,058,309	876,658	7,777	-----	1,066,086	876,658
Private right-of-way.....	42,187	30,194	-----	-----	42,187	30,194
Total.....	1,100,496	906,852	7,777	-----	1,108,273	906,852
All utilities:						
Highway right-of-way.....	15,225,949	3,252,724	13,873,953	574,886	29,099,902	3,827,610
Private right-of-way.....	1,751,503	1,186,836	4,679,428	3,413,700	6,430,931	4,600,536
Total.....	16,977,452	4,439,560	18,553,381	3,988,586	35,530,833	8,428,146

† Exclusive of betterments.

Source: Public utilities.

TABLE 25.—Public utility relocation cost, utility reimbursement, and cost and mileage of urban highway projects involving utility relocation, by highway systems, 1953: Utility located on either highway or private right-of-way

Item	Highway system		Federal-aid highways		Other State highways		All systems
	Primary system	Secondary system	Total	Primary system	Other high-ways	Total	
Public utility relocation cost: †							
Amount.....	\$14,960,499	\$886,117	\$15,846,616	\$645,398	\$485,438	\$1,130,836	\$16,977,452
Distribution.....percent.....	88.1	5.2	93.3	3.8	2.9	6.7	100.0
Utility reimbursement:							
Amount.....	\$4,204,501	\$21,045	\$4,225,546	\$62,293	\$151,721	\$214,014	\$4,439,560
Distribution.....percent.....	94.7	0.5	95.2	1.4	3.4	4.8	100.0
Cost of highway improvements involving utility relocation:							
Amount.....	\$318,652,432	\$13,461,715	\$332,114,147	\$18,066,537	\$9,974,604	\$28,071,441	\$360,185,588
Distribution.....percent.....	88.5	3.7	92.2	5.0	2.8	7.8	100.0
Mileage of highway projects involving utility relocation:							
Miles.....	695	69	764	41	74	115	879
Distribution.....percent.....	79.1	7.8	86.9	4.7	8.4	13.1	100.0

† Exclusive of betterments.

Source: Public utilities.

TABLE 26.—Public utility relocation cost, utility reimbursement, and cost and mileage of rural highway projects involving utility relocation, by highway systems, 1953: Utility located on either highway or private right-of-way

Item	Highway system						All systems
	Federal-aid highways			Other State highways			
	Primary system	Secondary system	Total	Primary system	Other high-ways	Total	
Public utility relocation cost: ¹							
Amount.....	\$10,573,697	\$5,366,980	\$15,940,677	\$2,114,773	\$497,931	\$2,612,704	\$18,553,381
Distribution.....percent..	57.0	28.9	85.9	11.4	2.7	14.1	100.0
Utility reimbursement:							
Amount.....	\$2,647,808	\$891,807	\$3,539,615	\$346,368	\$102,603	\$448,971	\$3,988,586
Distribution.....percent..	66.4	22.3	88.7	8.7	2.6	11.3	100.0
Cost of highway improvements involving utility relocation:							
Amount.....	\$458,481,282	\$213,526,267	\$672,007,549	\$48,394,779	\$17,317,908	\$65,712,687	\$737,720,236
Distribution.....percent..	62.2	28.9	91.1	6.6	2.3	8.9	100.0
Mileage of highway projects involving utility relocation:							
Miles.....	5,162	6,591	11,753	463	773	1,236	12,989
Distribution.....percent..	39.7	50.8	90.5	3.6	5.9	9.5	100.0

¹ Exclusive of betterments.

Source: Public utilities.

TABLE 27.—Public utility relocation cost, utility reimbursement, and cost and mileage of all highway projects involving utility relocation, by highway systems, 1953: Utility located on either highway or private right-of-way

Item	Highway system						All systems
	Federal-aid highways			Other State highways			
	Primary system	Secondary system	Total	Primary system	Other high-ways	Total	
Public utility relocation cost: ¹							
Amount.....	\$25,534,196	\$6,253,097	\$31,787,293	\$2,760,171	\$983,369	\$3,743,540	\$35,530,833
Distribution.....percent..	71.9	17.6	89.5	7.8	2.7	10.5	100.0
Utility reimbursement:							
Amount.....	\$6,852,309	\$912,852	\$7,765,161	\$408,661	\$254,324	\$662,985	\$8,428,146
Distribution.....percent..	81.3	10.8	92.1	4.9	3.0	7.9	100.0
Cost of highway improvements involving utility relocation:							
Amount.....	\$777,133,714	\$226,987,982	\$1,004,121,696	\$66,491,616	\$27,292,512	\$93,784,128	\$1,097,905,824
Distribution.....percent..	70.8	20.7	91.5	6.0	2.5	8.5	100.0
Mileage of highway projects involving utility relocation:							
Miles.....	5,857	6,660	12,517	504	847	1,351	13,868
Distribution.....percent..	42.3	48.0	90.3	3.6	6.1	9.7	100.0

¹ Exclusive of betterment.

Source: Public utilities.

TABLE 28.—Public utility relocation cost and utility reimbursement per mile and per dollar cost of highway projects involving utility relocation, by highway systems, 1953: Urban

Item	Highway system						All systems
	Federal-aid highways			Other State highways			
	Primary system	Secondary system	Total	Primary system	Other highways	Total	
On highway right-of-way:							
Utility relocation cost per dollar cost of highway improvements involving utility relocation.....cents per dollar..	4.19	6.39	4.28	3.55	3.57	3.56	4.23
Utility relocation cost reimbursed per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.99	0.10	0.95	0.33	0.35	0.34	0.90
Utility relocation cost per mile of highway projects involving utility relocation.....	\$19,233	\$12,469	\$18,622	\$15,673	\$4,816	\$8,686	\$17,322
Utility relocation cost reimbursed per mile of highway projects involving utility relocation.....	\$4,524	\$196	\$4,133	\$1,456	\$479	\$827	\$3,701
On private right-of-way:							
Utility relocation cost per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.50	0.19	0.49	0.02	1.30	0.47	0.48
Utility relocation cost reimbursed per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.33	0.06	0.32	0.01	1.17	0.42	0.33
Utility relocation cost per mile of highway projects involving utility relocation.....	\$2,293	\$373	\$2,120	\$68	\$1,744	\$1,147	\$1,993
Utility relocation cost reimbursed per mile of highway projects involving utility relocation.....	\$1,526	\$109	\$1,398	\$63	\$1,571	\$1,034	\$1,350
On highway or private right-of-way:							
Utility relocation cost per dollar cost of highway improvements involving utility relocation.....cents per dollar..	4.69	6.58	4.77	3.57	4.87	4.03	4.71
Utility relocation cost reimbursed per dollar cost of highway improvements involving utility relocation.....cents per dollar..	1.32	0.16	1.27	0.34	1.52	0.76	1.23
Utility relocation cost per mile of highway projects involving utility relocation.....	\$21,526	\$12,842	\$20,742	\$15,741	\$6,560	\$9,833	\$19,315
Utility relocation cost reimbursed per mile of highway projects involving utility relocation.....	\$6,050	\$305	\$5,531	\$1,519	\$2,050	\$1,861	\$5,051

Source: Public utilities.

TABLE 29.—Public utility relocation cost and utility reimbursement per mile and per dollar cost of highway projects involving utility relocation, by highway systems, 1953: Rural

Item	Highway system						All systems
	Federal-aid highways			Other State highways			
	Primary system	Secondary system	Total	Primary system	Other highways	Total	
On highway right-of-way:							
Utility relocation cost per dollar cost of highway improvements involving utility relocation.....cents per dollar..	1.68	1.93	1.76	3.47	2.19	3.13	1.88
Utility relocation cost reimbursed per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.09	0.04	0.08	0.09	0.20	0.12	0.08
Utility relocation cost per mile of highway projects involving utility relocation.....	\$1,488	\$627	\$1,005	\$3,627	\$489	\$1,664	\$1,068
Utility relocation cost reimbursed per mile of highway projects involving utility relocation.....	\$80	\$12	\$42	\$97	\$45	\$64	\$44
On private right-of-way:							
Utility relocation cost per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.63	0.58	0.61	0.90	0.69	0.85	0.63
Utility relocation cost reimbursed per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.49	0.38	0.45	0.63	0.39	0.56	0.46
Utility relocation cost per mile of highway projects involving utility relocation.....	\$560	\$187	\$351	\$941	\$155	\$450	\$360
Utility relocation cost reimbursed per mile of highway projects involving utility relocation.....	\$433	\$123	\$259	\$651	\$88	\$299	\$263
On highway or private right-of-way:							
Utility relocation cost per dollar cost of highway improvements involving utility relocation.....cents per dollar..	2.31	2.51	2.37	4.37	2.88	3.98	2.51
Utility relocation cost reimbursed per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.58	0.42	0.53	0.72	0.59	0.68	0.54
Utility relocation cost per mile of highway projects involving utility relocation.....	\$2,048	\$814	\$1,356	\$4,568	\$644	\$2,114	\$1,428
Utility relocation cost reimbursed per mile of highway projects involving utility relocation.....	\$513	\$135	\$301	\$748	\$133	\$363	\$307

Source: Public utilities.

TABLE 30.—Public utility relocation cost and utility reimbursement per mile and per dollar cost of highway projects involving utility relocation, by highway systems, 1953: Urban and rural

Item	Highway system						All systems
	Federal-aid highways			Other State highways			
	Primary system	Secondary system	Total	Primary system	Other highways	Total	
On highway right-of-way:							
Utility relocation cost per dollar cost of highway improvements involving utility relocation.....cents per dollar..	2.71	2.20	2.60	3.49	2.69	3.26	2.65
Utility relocation cost reimbursed per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.46	0.04	0.36	0.15	0.26	0.19	0.35
Utility relocation cost per mile of highway projects involving utility relocation.....	\$3,594	\$750	\$2,081	\$4,607	\$867	\$2,262	\$2,098
Utility relocation cost reimbursed per mile of highway projects involving utility relocation.....	\$608	\$14	\$292	\$207	\$82	\$129	\$276
On private right-of-way:							
Utility relocation cost per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.58	0.55	0.57	0.66	0.91	0.73	0.59
Utility relocation cost reimbursed per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.42	0.36	0.41	0.46	0.67	0.52	0.42
Utility relocation cost per mile of highway projects involving utility relocation.....	\$766	\$189	\$459	\$870	\$294	\$609	\$464
Utility relocation cost reimbursed per mile of highway projects involving utility relocation.....	\$562	\$123	\$328	\$604	\$218	\$362	\$332
On highway or private right-of-way:							
Utility relocation cost per dollar cost of highway improvements involving utility relocation.....cents per dollar..	3.29	2.75	3.17	4.15	3.60	3.99	3.24
Utility relocation cost reimbursed per dollar cost of highway improvements involving utility relocation.....cents per dollar..	0.88	0.40	0.77	0.61	0.93	0.71	0.77
Utility relocation cost per mile of highway projects involving utility relocation.....	\$4,360	\$639	\$2,540	\$5,477	\$1,161	\$2,771	\$2,562
Utility relocation cost reimbursed per mile of highway projects involving utility relocation.....	\$1,170	\$137	\$620	\$811	\$300	\$491	\$608

Source: Public utilities.

TABLE 31.—Public utility relocation cost per mile and per dollar cost of highway projects involving utility relocation, by type of highway and project location, 1953

Project location	Type of highway			
	Expressway	Divided highway other than expressway	Undivided highway other than expressway	Total
Urban:				
Utility relocation cost ¹ per dollar cost of highway improvement including utility relocation.....cents per dollar..	4.32	5.75	4.46	4.71
Utility relocation cost ¹ per mile of highway projects involving utility relocation.....	\$47,986	\$30,035	\$7,516	\$19,315
Rural:				
Utility relocation cost ¹ per dollar cost of highway improvement including utility relocation.....cents per dollar..	1.90	3.17	2.55	2.51
Utility relocation cost ¹ per mile of highway projects involving utility relocation.....	\$5,265	\$5,099	\$1,156	\$1,428
Total:				
Utility relocation cost ¹ per dollar cost of highway improvement including utility relocation.....cents per dollar..	3.39	4.56	2.82	3.24
Utility relocation cost ¹ per mile of highway projects involving utility relocation.....	\$17,515	\$11,695	\$1,431	\$2,562

¹ Exclusive of betterment.

Source: Public utilities.

TABLE 32.—Public utility relocation cost and utility reimbursement by type of utility ownership and project location, 1953: Utility located on highway right-of-way

Item	Nature of utility ownership			
	Publicly owned	Privately owned	Cooperatively owned	Total
Urban:				
Public utility relocation cost: ¹				
Amount.....	\$4,193,758	\$10,985,291	\$46,900	\$15,225,949
Distribution.....percent..	27.5	72.2	0.3	100.0
Utility reimbursement:				
Amount.....	\$1,981,588	\$1,269,708	\$1,428	\$3,252,724
Distribution.....percent..	60.9	39.0	0.1	100.0
Rural:				
Public utility relocation cost: ¹				
Amount.....	\$759,158	\$12,934,299	\$180,526	\$13,873,983
Distribution.....percent..	5.5	93.2	1.3	100.0
Utility reimbursement:				
Amount.....	\$70,782	\$491,164	\$12,940	\$574,886
Distribution.....percent..	12.3	85.4	2.3	100.0
Total:				
Public utility relocation cost: ¹				
Amount.....	\$4,952,916	\$23,919,590	\$227,426	\$29,099,932
Distribution.....percent..	17.0	82.2	0.8	100.0
Utility reimbursement:				
Amount.....	\$2,052,370	\$1,760,872	\$14,368	\$3,827,610
Distribution.....percent..	53.6	46.0	0.4	100.0

¹ Exclusive of betterment.

Source: Public utilities.

NOTE: Table 33 is on p. 54.

TABLE 34.—Extent of Government reimbursement in relation to public utility relocation cost of projects involving reimbursement, by type of government and project location, 1953

Project location	Reimbursing government								Type of government not specified	Grand total	
	Federal ²	State	Local				State and Federal	State and county			County and township
			Total	County	City	Township					
Urban:											
Highway right-of-way:											
Utility relocation cost ¹	\$123,368	\$4,142,058	\$143,186	\$89,456	\$53,730					\$112,713	\$4,521,325
Reimbursement:											
Amount.....	\$58,913	\$2,977,671	\$111,633	\$63,672	\$47,961					\$104,507	\$3,252,724
Percent of relocation cost.....	47.8	71.9	78.0	71.2	89.3					92.7	71.9
Private right-of-way:											
Utility relocation cost ¹	\$3,049	\$1,260,281	\$21,511	\$13,807	\$7,704					\$226,342	\$1,511,183
Reimbursement:											
Amount.....	\$3,036	\$986,694	\$18,623	\$11,250	\$7,373					\$178,483	\$1,186,836
Percent of relocation cost.....	99.6	78.3	86.6	81.5	95.7					78.9	78.5
Total:											
Utility relocation cost ¹	\$126,417	\$5,402,339	\$164,697	\$103,263	\$61,434					\$339,055	\$6,032,508
Reimbursement:											
Amount.....	\$61,949	\$3,964,365	\$130,256	\$74,922	\$55,334					\$282,990	\$4,439,560
Percent of relocation cost.....	49.0	73.4	79.1	72.6	90.1					83.5	73.6
Rural:											
Highway right-of-way:											
Utility relocation cost ¹	\$92,818	\$978,073	\$14,768	\$14,768				\$13,203		\$39,167	\$1,138,029
Reimbursement:											
Amount.....	\$63,029	\$466,188	\$6,746	\$6,746				\$11,817		\$27,106	\$574,885
Percent of relocation cost.....	67.9	47.7	45.7	45.7				89.5		69.2	50.5
Private right-of-way:											
Utility relocation cost ¹	\$67,719	\$3,389,672	\$291,781	\$289,742		\$2,039	\$777	\$6,235	\$285	\$347,361	\$4,103,830
Reimbursement:											
Amount.....	\$64,056	\$2,861,692	\$217,478	\$215,770		\$1,708	\$777	\$5,587	\$285	\$263,825	\$3,413,700
Percent of relocation cost.....	94.6	84.4	74.5	74.5		83.8	100.0	89.6	100.0	76.0	83.2
Total:											
Utility relocation cost ¹	\$160,537	\$4,367,745	\$306,549	\$304,510		\$2,039	\$777	\$19,438	\$285	\$386,528	\$5,241,859
Reimbursement:											
Amount.....	\$127,085	\$3,327,880	\$224,224	\$222,516		\$1,708	\$777	\$17,404	\$285	\$290,931	\$3,988,586
Percent of relocation cost.....	79.2	76.2	73.1	73.1		83.8	100.0	89.5	100.0	75.3	76.1

Urban and rural:											
Highway right-of-way:											
Utility relocation cost ¹	\$216,186	\$5,120,131	\$157,954	\$104,224	\$53,730			\$13,203		\$151,880	\$5,659,354
Reimbursement:											
Amount.....	\$121,942	\$3,443,859	\$118,379	\$70,418	\$47,961			\$11,817		\$131,613	\$3,827,610
Percent of relocation cost.....	56.4	67.3	74.9	67.6	89.3			89.5		86.7	67.6
Private right-of-way:											
Utility relocation cost ¹	\$70,768	\$4,649,953	\$313,292	\$303,549	\$7,704	\$2,039	\$777	\$6,235	\$285	\$573,703	\$5,615,013
Reimbursement:											
Amount.....	\$67,092	\$3,848,386	\$236,101	\$227,020	\$7,373	\$1,708	\$777	\$5,587	\$285	\$442,308	\$4,600,536
Percent of relocation cost.....	94.8	82.8	75.4	74.8	95.7	83.8	100.0	89.6	100.0	77.1	81.9
Total:											
Utility relocation cost ¹	\$286,954	\$9,770,084	\$471,246	\$407,773	\$61,434	\$2,039	\$777	\$19,438	\$285	\$725,583	\$11,274,367
Reimbursement:											
Amount.....	\$189,034	\$7,292,245	\$354,480	\$297,438	\$55,334	\$1,708	\$777	\$17,404	\$285	\$573,921	\$8,428,146
Percent of relocation cost.....	65.9	74.6	75.2	72.9	90.1	83.8	100.0	89.5	100.0	79.1	74.8

¹ Cost exclusive of betterment, involving only those utility relocation projects for which reimbursement was made in whole or in part.
² Involves reimbursement by Federal agencies other than the Bureau of Public Roads.

Source: Public utilities

TABLE 33.—Public utility relocation cost and utility reimbursement, by type of utility ownership and project location, 1953: Utility located on either highway or private right-of-way

Project location	Nature of utility ownership			
	Publicly owned	Privately owned	Cooperatively owned	Total
Urban:				
Public utility relocation cost: ¹				
Amount.....	\$4,724,747	\$12,201,558	\$51,147	\$16,977,452
Distribution.....percent..	27.8	71.9	0.3	100.0
Utility reimbursement:				
Amount.....	\$2,299,033	\$2,138,929	\$1,598	\$4,439,560
Distribution.....percent..	51.8	48.2		100.0
Rural:				
Public utility relocation cost: ¹				
Amount.....	\$919,886	\$17,096,953	\$536,542	\$18,553,381
Distribution.....percent..	5.0	92.1	2.9	100.0
Utility reimbursement:				
Amount.....	\$167,334	\$3,587,777	\$233,475	\$3,988,586
Distribution.....percent..	4.2	89.9	5.9	100.0
Total:				
Public utility relocation cost: ¹				
Amount.....	\$5,644,633	\$29,298,511	\$587,689	\$35,530,833
Distribution.....percent..	15.9	82.5	1.6	100.0
Utility reimbursement:				
Amount.....	\$2,466,367	\$5,726,706	\$235,073	\$8,428,146
Distribution.....percent..	29.3	67.9	2.8	100.0

¹ Exclusive of betterment.

Source: Public utilities.

APPENDIX D—JUDICIAL DECISIONS AFFECTING PUBLIC UTILITY RELOCATION NECESSITATED BY HIGHWAY IMPROVEMENT

I. For cases involving the duty of utilities at their own cost to move their facilities located in highway right-of-way when necessitated by the construction or improvement of the highways, by the changing of grade of the highways, or by the elimination of grade crossings, see:

- Pruett v. Southern Bell Tel. & Tel.*, Equity, Cir. Ct. Ala., 1954.
State v. Marin Municipal Water District, 17 Cal. 2d 699, 111 P. 2d 651 (1941).
Southern Bell Tel. & Tel. v. Florida ex rel. Ervin, — Fla. —, 75 So. 2d 796 (1954).
Hammond, W. & E. C. Ry. v. Zeigler, 198 Ind. 456, 1952 N. E. 806 (1926).
Union Light, Heat & Power Co. v. Louisville & N. R. R., 257 Ky. 761, 79 S. W. 2d 199 (1935).
Southern Bell Tel. & Tel. v. Commonwealth, — Ky. —, 266 S. W. 2d 308 (1954).
Natick Gaslight Co. v. Natick, 175 Mass. 246, 56 N. E. 292 (1900).
Erie R. R. v. Board of Public Utility Comm'rs, 254 U. S. 394 (1921).
New Jersey Bell Tel. Co. v. Delaware River Joint Comm'n, 125 N. J. L. 235, 15 A. 2d 221 (1940).
In re Deering, 93 N. Y. 361 (1883).
Transit Comm'n v. Long Island R. R., 253 N. Y. 345, 171 N. E. 565 (1930).
City of New York v. Brooklyn Edison Co., 247 App. Div. 48, 286 N. Y. S. 678 (1936).
 Contra: *City of New York v. New York Tel. Co.*, 278 N. Y. 9, 14 N. E. 2d 831 (1938) (elimination of subway entrances is proprietary function).
Tilton v. State, 259 App. Div. 507, 20 N. Y. S. 2d 76 (1940), aff'd mem., 285 N. Y. 601, 133 N. E. 2d 540 (1941).
Matter of Cheektowaga, 259 App. Div. 141, 18 N. Y. S. 2d 613, aff'd mem., 283 N. Y. 687, 28 N. E. 2d 409 (1940).
Western New York Water Co. v. Brandt, 259 App. Div. 11, 18 N. Y. S. 2d 128, appeal dism., 283 N. Y. 686, 28 N. E. 2d 408 (1940).
Public Service Comm'n of New York v. City of New York, 268 App. Div. 121, 49 N. Y. S. 2d 214 (1944).
New York City Tunnel Authority v. Consolidated Edison Co. of New York, 295 N. Y. 467, 68 N. E. 2d 445 (1946).
Consolidated Edison Co. of New York v. State of New York, 276 App. Div. 677, 97 N. Y. S. 2d 431 (1950), aff'd mem., 302 N. Y. 711, 98 N. E. 2d 587 (1951).
Ganz v. Ohio Postal-Telegraph Cable Co., 140 Fed. 692 (6th Cir. 1905).
Change of Grade of Kerlin Street, 12 Pa. Dist. Rep. 764 (1903).
Scranton Gas & Water Co. v. Scranton, 214 Pa. 586, 64 Atl. 84 (1906).
Springfield Water Co. v. Philadelphia & G. Street Ry., 45 Pa. Super. 516 (1911).
Philadelphia Electric Co. v. Commonwealth, 311 Pa. 542, 166 Atl. 892 (1933).
Pennsylvania ex rel. Bard v. Philadelphia Electric Co., Equity, C. P. Ct. Pa. (1938).
Bell Tel. Co. of Pennsylvania v. Pennsylvania PUC, 139 Pa. Super. 529, 12 A. 2d 479 (1940).
Lewistown-Reedsville Water Co. v. Commonwealth, 49 Dau. Co. Rep. (Pa.) 18 (1940).
In re Delaware River Joint Comm'n, 342 Pa. 119, 19 A. 2d 278 (1941).
Philadelphia Suburban Water Co. v. Pennsylvania PUC, 168 Pa. Super. 360, 78 A. 2d 46 (1951).
Dakota Central Tel. Co. v. Shipman Construction Co., 49 S. D. 251, 207 N. W. 72 (1926).
Nashville v. Tennessee, Sup. Ct. Tenn. (1953).
Western Gas Co. of Washington v. Bremerton, 21 Wash. 2d 907, 153 P. 2d 946 (1944).
County Court v. White, 79 W. Va. 475, 91 S. E. 350 (1917).
State ex rel. City of Benwood v. Benwood & McMechen Water Co., 94 W. Va. 724, 120 S. E. 918 (1923).
Public Water Supply District No. 6 v. United States, 66 F. Supp. 66 (S. D. Mo. 1946).

But compare:

- Los Angeles County v. Wright*, 236 P. 2d 892 (Cal. 1951) (utility located on private right-of-way).
Panhandle Eastern Pipeline Co. v. State Highway Comm'n, 294 U. S. 613 (1935) (utility located on private right-of-way).
Southern Bell Tel. Co. v. Nashville, 35 Tenn. App. 207, 243 S. W. 2d 617 (1951), Cert. denied, — U. S. — (Oct. 9, 1951) (arbitrary discrimination against one utility).

II. For cases involving the duty of utilities to move their facilities located in the highway right-of-way when necessitated by proprietary or governmental activities of the State or its agents, other than activities involving highway improvements, and the allocation of cost among the affected utilities and governmental units, see:

- A. Privately or municipally owned utilities must bear the cost:
- Merced Falls Gas & Electric Co. v. Turner*, 2 Cal. App. 720, 84 Pac. 239 (1906) (construction of sidewalks is governmental function).
- Anderson v. Fuller*, 51 Fla. 380, 41 So. 684 (1906) (municipal sewage system is governmental).
- Macon St. R. R. v. Macon*, 112 Ga. 782, 38 S. E. 60 (1901) (public safety requires removal of streetcar tracks).
- Macon v. Southern Bell Tel. & Tel.*, 89 Ga. App. 252, 79 S. E. 2d 265 (1953) (city hospital is governmental function).
- Peoples Gas Light & Coke Co. v. Chicago*, 413 Ill. 457, 109 N. E. 2d 777 (1953) (municipal subway construction is governmental function).
- Louisville Gas & Electric Co. v. Comm'rs of Sewerage of Louisville*, 236 Ky. 376, 33 S. W. 2d 344 (1931) (city sewerage system is governmental).
- New Orleans Gas Light Co. v. Drainage Comm'n of New Orleans*, 197 U. S. 453 (1905) (drainage system is governmental function).
- Western Union v. Police Jury of Lafayette*, 225 La. 531, 73 So. 2d 450 (1954) (improvement of navigation is governmental function).
- Belfast Water Co. v. Belfast*, 92 Maine 52, 42 Atl. 235 (1898) (construction of sidewalks is governmental).
- Detroit Edison Co. v. Detroit*, 332 Mich. 348, 51 N. W. 2d 245 (1952) (construction of municipal sewer is governmental function).
- National Water Works Co. of New York v. City of Kansas*, 28 Fed. 921 (C. C. W. D. Mo. 1888) (construction of city sewer is governmental function).
- Nicholas Di Menna & Sons, Inc. v. City of New York*, 114 N. Y. S. 2d 347 (Sup. Ct. 1952) (construction of public sewer is governmental).
- Jamaica Water Supply Co. v. City of New York*, 280 App. Div. 834, 114 N. Y. S. 2d 79 (1952), aff'd mem., 304 N. Y. 1917, 110 N. E. 2d 739, certiorari denied, 346 U. S. 821 (1953) (city water supply system is governmental function).
- Philadelphia Electric Co. v. Philadelphia*, 301 Pa. 291, 152 Atl. 23 (1930) (subway construction is governmental function).

B. State or governmental unit must bear the cost:

- Los Angeles v. Los Angeles Gas & Electric Co.*, 251 U. S. 32 (1919) (municipal lighting system is proprietary function).
- Illinois Bell Tel. Co. v. Charles Ind Co.*, 121 N. E. 2d 600 (App. Ct. Ill. 1954) (private sanitary sewer constructed negligently).
- Westchester Electric R. R. v. Westchester Park Comm'n*, 255 N. Y. 297, 174 N. E. 660 (1931) (involving statute relating to county parkways).
- City of New York v. New York Tel. Co.*, 278 N. Y. 9, 14 N. E. 2d 831 (1938) (elimination of subway entrances is proprietary function).
- Contra: *City of New York v. Brooklyn Edison Co.*, 247 App. Div. 48, 286 N. Y. S. 678 (1936) (elimination of subway entrances is part of the improvement of the highways and is governmental function).
- Petition of Gillespie*, 263 App. Div. 175, 32 N. Y. S. 2d 96, aff'd mem., 288 N. Y. 514, 41 N. E. 2d 926 (1942) (involving statute relating to municipal water supply system).
- In re Gillen Place*, 304 N. Y. 215, 106 N. E. 2d 897 (1952) (closing street for bus depot is proprietary function).
- Postal Telegraph-Cable Co. v. Pennsylvania PUC*, 154 Pa. Super. 340, 35 A. 2d 535 (1944) (municipal airport is proprietary function).
- Milwaukee Electric Ry. & Light Co. v. Milwaukee*, 209 Wis. 656, 245 N. W. 856 (1932) (construction of city water main is proprietary function).

III. For cases involving the privilege of utilities to locate their facilities in the highway right-of-way, and nature of the rights they obtain, if any, and the obligations they assume thereby, see:

- Southern Bell Tel. & Tel. v. Mobile*, 162 Fed. 523 (C. C. S. D. Ala. 1907).
- Russell v. Sebastian*, 233 U. S. 195 (1914).
- Roswell v. Mountain States Tel. & Tel.*, 78 F. 2d 379 (10th Cir. 1935).
- Carver v. State*, 11 Ga. App. 22, 74 S. E. 556 (1912).
- Cumberland Tel. & Tel. v. Evansville*, 127 Fed. 187 (C. C. Ind. 1903).
- Iowa Tel. Co. v. Keokuk*, 226 Fed. 82 (S. D. Iowa 1915).
- Louisville City Ry. v. Louisville*, 71 Ky. (8 Bush) 415 (1871).

- East Tennessee Tel. Co. v. Frankfort*, 190 Fed. 346 (E. D. Ky. 1911).
- Louisville v. Cumberland Tel. & Tel.*, 224 U. S. 649 (1912).
- Owensboro v. Cumberland Tel. & Tel.*, 230 U. S. 58 (1913).
- Western Union Tel. Co. v. Massachusetts*, 125 U. S. 530 (1888).
- Essex v. New England Tel. & Tel.*, 239 U. S. 313 (1916).
- Willmut Gas & Oil Co. v. Covington County*, —Miss. —, 71 So. 2d 184 (1954).
- City of Hannibal v. Missouri & Kansas Tel. Co.*, 31 Mo. App. 23 (1888).
- St. Louis v. Western Union Tel. Co.*, 148 U. S. 92 (1893).
- State ex rel. Highway Comm'n v. Union Electric Co.*, 142 S. W. 2d 1099 (Mo. 1944).
- State ex rel. McKittrick v. Southwestern Bell Tel. Co.*, 92 S. W. 2d 612 (Mo. 1936).
- Old Colony Trust Co. v. Omaha*, 230 U. S. 100 (1913).
- Bourget v. Public Service Comm'n*, 97 A. 2d 383 (N. H. 1953).
- New York Electric Lines Co. v. Empire City Subway Co.*, 235 U. S. 179 (1914).
- Porter v. Municipal Gas Co.*, 220 N. Y. 152, 115 N. E. 457 (1917).
- O'Meara v. Postal Telegraph-Cable Co.*, 279 N. Y. 282, 18 N. E. 2d 157 (1938).
- Elizabeth City v. Banks*, 150 N. C. 407, 64 S. E. 189 (1909).
- Hardin-Wyandot Lighting Co. v. Upper Sandusky*, 251 U. S. 173 (1919).
- Duquesne Light Co. v. Pittsburgh*, 251 Pa. 557, 97 Atl. 85 (1916).
- Oil City v. Postal Telegraph Co.*, 68 Pa. Super. 77 (1917).
- Bell Tel. Co. of Pennsylvania v. Lewis*, 317 Pa. 387, 177 Atl. 36 (1936).
- Knowville v. Africa*, 77 Fed. 501 (6th Cir. 1896).
- Morristown v. East Tennessee Tel. Co.*, 115 Fed. 304 (6th Cir. 1902).
- Chattanooga v. Tennessee E. P. Co.*, 172 Tenn. 524, 112 S. W. 2d 385 (1938).
- Fort Worth v. Southwestern Bell Tel. Co.*, 80 F. 2d 972 (5th Cir. 1936).
- Texas-New Mexico Utilities Co. v. State ex rel. City of Teague*, 174 S. W. 2d 57 (Tex. Civ. App. 1943).
- Richmond v. Southern Bell Tel. & Tel.*, 174 U. S. 761 (1899).
- Western Union Tel. Co. v. Richmond*, 224 U. S. 160 (1912).
- United States v. Puget Sound Power & Light*, 147 F. 2d 957 (9th Cir. 1944).
- In re Rapier*, 143 U. S. 110 (1892).
- In re Debs*, 158 U. S. 564 (1895).
- Western Union Tel. Co. v. Pennsylvania R. R.*, 195 U. S. 540 (1904).

APPENDIX E—LAW AND PRACTICE CONCERNING PUBLIC UTILITY RELOCATION, BY STATES

SUMMARY OF LAW AND PRACTICE CONCERNING PUBLIC UTILITY RELOCATION IN HIGHWAY RIGHT-OF-WAY, AND COST RESPONSIBILITY, BY STATES, 1954¹

ALABAMA

Judicial decisions

Southern Bell Tel. & Tel. v. Mobile, 162 Fed. 523 (C. C. S. D. Ala. (1907)). A city can be enjoined from cutting down a telephone company's poles after the company refused to comply with an ordinance requiring it to use another company's poles, after the city had consented to the company's use of its streets.

Pruett v. Southern Bell Tel. & Tel., Equity, Cir. Ct. Ala., 1954. The State can require a utility to relocate its facilities located in the margin of highways at the expense of the utility when highway improvement and widening require.

Practice

Utilities.

ARIZONA

Practice

Utilities.

ARKANSAS

Practice

Utilities.

¹ Only the predominant features of State legislation have been summarized in this table; variations of all kinds exist in many of the State laws. Likewise, only the highlights of State practice with respect to utility relocation reimbursement have been included. There are more than 175 judicial decisions that are relevant to the public utility relocation problem, but only the most important cases have been included here.

While no jurisdiction is bound by another jurisdiction's pronouncement of the common law, there has been no dissent from the common law rule as enunciated by numerous courts that, in the absence of a clear statutory mandate shifting the burden to the State, utilities are obliged to relocate at their own expense their facilities located in public highways when required to facilitate highway improvements. Thus, although not all jurisdictions have passed on the question specifically, this would seem to be the applicable rule in those jurisdictions whose courts and legislatures have remained silent on the problem.

CALIFORNIA

Statutory provisions

Designated publicly owned and privately owned utilities in conventional State highway right-of-way in urban and rural areas must be moved at expense of utility. Special provisions apply to freeways.

Judicial decisions

Merced Falls Gas & Electric Co. v. Turner, 2 Cal. App. 720, 84 Pac. 239 (1906). A utility which has been granted permission to maintain its poles in the sidewalks of a city for a number of years can be compelled to change the position of those poles to other locations in the sidewalks when necessitated by the construction of artificial stone walks by the city.

Russell v. Sebastian, 233 U. S. 195 (1914). After a city has given permission to a utility to commence service and to use its streets under a California constitutional provision authorizing this use, and after the company has accepted the grant by using the streets, the city cannot refuse to permit the company to extend its services.

Los Angeles v. Los Angeles Gas & Electric Co., 251 U. S. 32 (1919). A city which had consented to the use of its streets in accordance with the California constitutional provision at that time granting to utilities the right to use the streets of consenting municipalities could not compel a utility to relocate its facilities at its own expense when the city desired to construct a municipal lighting system.

State v. Marin Municipal Water District, 17 Cal. 2d 699, 111 P. 2d 651 (1941). The State can compel a utility at its own expense to move its facilities located in a highway when the highway is being improved, even though the utility had obtained a franchise right to locate in the highway. The statute under which the company was required to move was held to apply to municipally owned utilities.

Los Angeles County v. Wright, 236 P. 2d 892 (Cal. 1951). The county, which had obtained a road easement over private lands, could not compel a utility, which had located its lines on private right-of-way obtained from the same grantor, to relocate its line at its own cost; to interpret a statute compelling utilities to move their lines from within highway rights-of-way to require this utility to move at its own expense would deprive the utility of its constitutional rights.

Practice

1. Publicly owned, non-revenue-producing utilities, located on conventional-type highway: State.
2. Privately or publicly owned utilities located on conventional-type highway by permit or franchise and not by reason of prior property rights: Utilities.
3. Public districts, legally occupying highway right-of-way: Districts.
4. Utilities lawfully maintained on freeway right-of-way:
 - (a) Publicly or privately owned, moved entirely outside freeway right-of-way: State.
 - (b) Utility lawfully installed in city street or county road before such street or road came into State freeway system and relocated within freeway right-of-way:
 - (1) Publicly owned, nonrevenue-producing utilities and privately owned street lighting structures: State (but not where initial installation was in State highway.)
 - (2) If privately owned, costs allocated in accordance with agreements where such have been entered into, otherwise by State under certain circumstances. (Generally, agreements provide for a 50-50 division of costs, but under certain limited circumstances State pays 100 percent of cost.)

COLORADO

Practice

Utilities, except where prior property rights exist.

CONNECTICUT

Statutory provisions

Designated utilities on controlled-access highways must move, and relocation cost is shared by highway department and utilities.

Practice

1. If located on non-controlled-access highway right-of-way: Utilities.
2. If located on controlled-access highway right-of-way: Cost is equitably shared (i. e. in proportion to benefits received).

DELAWARE

Practice

1. Publicly owned utilities, on highway or private right-of-way: State.
2. Privately owned utilities, on highway right-of-way: Utilities.

FLORIDA

Statutory provisions

Specified publicly owned and privately owned utilities in State highway right-of-way in urban areas must be moved by utility.

Judicial decisions

Anderson v. Fuller, 51 Fla. 380, 41 So. 684 (1906). A bid by a contractor for the construction of a municipal sewerage system which includes the cost of relocating privately owned utility facilities is not the lowest responsible bid, since the city is not liable for those costs.

Southern Bell Tel. & Tel. v. Florida ex rel. Ervin, — Fla. —, 75 So. 2d 796 (1954). The State can require a utility to move its facilities located in the public highways under authority of a statute when this move is required by the construction of a Federal-aid expressway.

Practice

1. Outside municipalities: Utilities.
2. Municipal connecting link State roads: By agreement with municipality, relocation made without cost to State (municipality and utility company agree concerning payment of costs).

GEORGIA

Judicial decisions

Macon Street R. R. v. Macon, 112 Ga. 782, 38 S. E. 60 (1901). A city can compel a street railway to move its tracks from the side to the center of a road at its own cost if public safety and convenience require.

Carver v. State, 11 Ga. App. 22, 74 S. E. 556 (1912). An official of a telephone company who removed poles from the center of an improved highway and relocated them on side of road without obtaining the requisite permission of county authorities cannot be arrested for violating the county's safety ordinances, since county officials had no right to refuse to designate new place to which they could be removed; the county had only regulative, not prohibitory powers.

Macon v. Southern Bell Tel. & Tel., 89 Ga. App. 252, 79 S. E. 2d 265 (1953). A city can compel a utility which has located its facilities with permission in the streets of the city to relocate them at the company's cost when necessitated by the construction of a municipal hospital.

Practice

Utilities.

IDAHO

Practice

Utilities.

ILLINOIS

Judicial decisions

Peoples Gas Light & Coke Co. v. Chicago, 413 Ill. 457, 109 N. E. 2d 777 (1953). The city is not obligated to reimburse a utility for the cost of protecting and relocating its facilities located in the public streets when necessitated by the construction of a municipal subway system, since that is a governmental function.

Illinois Bell Tel. Co. v. Chas. Ind. Co., 121 N. E. 2d 600 (App. Ct. Ill. 1954). A telephone company whose lines are injured by a contractor in the construction of a sanitary sewer and the grading of extensions of existing city streets can

recover damages since the utility obtained a proprietary or possessory interest protected from damage by subsequent users; it was a duty of the contractor to inform itself of the location of the utility's lines.

Practice

1. Privately and cooperatively owned utilities: Utilities.
2. Publicly owned utilities in rural areas: Utilities.
3. Municipally owned utilities:
 - (a) On highway right-of-way outside of city of Chicago and Cook County expressway system: Municipality and State pay proportionate shares of cost, on same basis as street improvement costs, as follows:

Population of municipality	Participation
Over 25,000.....	50 percent of total cost by State.
10,000 to 25,000....	Width of moving traffic lanes Curb to curb width × total cost = State's share.
5,000 to 10,000.....	75 percent by State.
Under 5,000.....	Municipality to pay 2 years' motor fuel tax allotments, or 25 percent of total cost, whichever is lesser.

- (b) On expressway system in city of Chicago: $\frac{1}{2}$ of cost by State, $\frac{1}{2}$ by Chicago, $\frac{1}{2}$ by Cook County.
- (c) On expressway system in Cook County (outside city of Chicago): 50 percent of cost borne by State and 50 percent by Cook County.

INDIANA

Statutory provisions

Specified publicly owned and privately owned utilities in State highway right-of-way in urban areas and telephone cooperatives in urban and rural areas must be moved at expense of utility.

Judicial decisions

Cumberland Tel. & Tel. v. Evansville, 127 Fed. 187 (C. C. Ind. 1903). A telephone company which purchases the plant of another company, the former one having been granted unlimited right to locate its facilities in the streets of a city, can be required by the city to remove its poles, since no express or implied power had been granted to the former company to sell its franchise.

Hammond, W. & E. C. Ry. v. Ziegler, 198 Ind. 456, 152 N. E. 806 (1926). A street railway which has been granted permission to locate its tracks in a highway prior to the highway's annexation by a city can be required by the State highway department to move its tracks to the center of the State highway as improved and widened by the State highway commission with Federal aid, even though the project is within the present city limits.

Practice

Utilities (under broad powers, applies to all utilities).

IOWA

Statutory provisions

Specified privately owned utilities in State and county highways, privately owned telegraph and telephone facilities in public roads, and publicly owned gas and water mains in rural areas must be moved at expense of utilities.

Judicial decisions

Des Moines City Ry. v. Des Moines, 90 Iowa 770, 58 N. W. 906 (1894). A street railway company cannot be required to remove and relocate its tracks from the center of the streets of a municipality where they have been constructed with the approval and at the direction of that municipality to the side of the streets in order to permit the construction of a municipal sewer, since the cost to the street railway would be burdensome and since there was adequate room on the side of the streets for the sewer.

Iowa Tel. Co. v. Keokuk, 226 Fed. 82 (S. D. Iowa 1915). A company which located its facilities in the streets of a city and which expended money in reliance on an Iowa code provision giving such companies the right to use public highways

with the city's assent to its location, cannot be compelled subsequently to obtain a franchise from the city or to comply with maximum rates set by the city.

Practice

1. Located on urban extensions of State highways:
 - (a) Privately owned utilities: As determined by franchise provisions.
 - (b) Publicly owned utilities: As determined by ordinance provisions.
2. Telephone lines on highway right-of-way outside cities and towns: Utilities.
3. Water and gas mains, sidewalks and canteenways: Located subject to such conditions as highway authority may prescribe.
4. Pipeline companies, power lines (under jurisdiction of Commerce Commission, which may prescribe conditions for location): Utilities, upon insistence of highway commission.

KANSAS

Statutory provisions

Specified publicly owned and privately owned utilities in State highway right-of-way in urban and rural areas must be moved at expense of utility.

Judicial decisions

Panhandle Eastern Pipeline Co. v. State Highway Comm'n, 294 U. S. 613 (1935). A State highway commission cannot invoke a statute, requiring utilities located within the right-of-way of a highway to relocate their facilities at their own expense, against a pipeline company located on its own private right-of-way when the commission desires to lay out a new highway over that right-of-way; this would violate the utility's constitutional rights.

Practice

1. Privately or cooperatively owned utilities: Utilities.
2. Publicly owned utilities: Local government.

KENTUCKY

Statutory provisions

All privately owned utilities in State highway right-of-way in rural areas and specified publicly owned and privately owned utilities in public roads must be moved at expense of utility.

Judicial decisions

Louisville City Ry. v. Louisville, 71 Ky. (8 Bush) 415 (1871). A city can require a street railway to remove its existing track and to lay a new type of track in the street when the city repaves the street, even though the city had originally given permission to lay that type of track.

East Tennessee Tel. Co. v. Frankfort, 190 Fed. 346 (E. D. Ky. 1911). After a telephone company has spent a large amount of money in reliance on a city's irrevocable permission to operate its line over the streets of the city, that city cannot repeal its permission nor can it prescribe the rental to be charged by the telephone company.

Louisville v. Cumberland Tel. & Tel., 224 U. S. 649 (1912). A city cannot, prior to its expiration, repeal the permission it had granted to a utility to occupy its streets when the utility had expended great sums of money in reliance on that permission.

Owensboro v. Cumberland Tel. & Tel., 230 U. S. 58 (1913). A city cannot compel a utility to remove from the streets its lines erected pursuant to the city's express permission which was unlimited in time.

Louisville Gas & Electric Co. v. Comm'rs of Sewerage of Louisville, 236 Ky. 376, 33 S. W. 2d 344 (1931). A utility which has located its facilities in the public streets cannot recover for damage to its facilities caused by the nonnegligent construction of a city sewerage system, which the court held to be a valid exercise of the police power.

Union Light, Heat & Power Co. v. Louisville & N. E. R., 257 Ky. 761, 79 S. W. 2d 199 (1935). A utility which is required to relocate its facilities located in the streets of a city when the city and a railroad eliminate a grade crossing at those streets cannot recover for the cost of that relocation either from the city or from the railroad, despite the railroad's contract with the city to reimburse anyone to whom the city might be liable.

Southern Bell Tel. & Tel. v. Commonwealth, — Ky. —, 266 S. W. 2d 308 (1954). Utilities which have located their facilities within highways under permission providing that they should not obstruct the use of the highways can be forced to relo-

cate those facilities at their own expense when the improvements of those highways so require, even though they are Federal-aid projects.

Practice

Utilities.

LOUISIANA

Statutory provisions

Specified publicly owned and privately owned utilities in State highway right-of-way in urban and rural areas must be moved at expense of utility.

Judicial decisions

New Orleans Gas Light Co. v. Drainage Comm'n of New Orleans, 197 U. S. 453 (1905). A utility which has been granted the exclusive right to vend gas in New Orleans and the privilege of laying its pipes in the streets of that city can be required to relocate those facilities at its own cost when the State adopts a plan for the improvement of its existing drainage system, since that is a valid exercise of the police power.

Western Union v. Police Jury of Lafayette, — La. —, 73 So. 2d 450 (1954) (dig.). A utility which maintained a telegraph line across a river in a line paralleling a railroad bridge as authorized by a Louisiana statute can be required to move at its own cost when required by a program for the improvement of navigation; however, the case was remanded to see if the removal was actually necessary, since the utility had alleged that the move had been ordered solely to permit a dredge to take a land route rather than a route under the bridge.

Practice

Utilities.

MAINE

Judicial decisions

Belfast Water Co. v. Belfast, 92 Me. 52, 42 Atl. 235 (1898). Utility which is given permission to construct watergates within the limits of a street of a municipality near the edge of an existing sidewalk cannot recover from that municipality the cost of relocating the gates when necessitated by the widening of the sidewalk and the construction of granite curbing, without an express agreement on the part of the municipality, since the repair to the sidewalk constitutes a valid exercise of the police powers.

Practice

Utilities.

MARYLAND

Practice

Utilities.

MASSACHUSETTS

Judicial decisions

Natick Gaslight Co. v. Natick, 175 Mass. 246, 56 N. E. 292 (1900). A company cannot recover for the cost of relocating its mains located by permission of a city in its streets when necessitated by the elimination of a grade crossing over those streets, despite a statute requiring the payment of compensation for injury to property caused by the changing of grades of public ways.

Essex v. New England Tel. & Tel., 239 U. S. 313 (1916). A city cannot refuse permission to repair its lines to a company which had complied with the 1866 Federal Post Roads Act and had erected its lines in the city's streets without objection by the city, pursuant to a State act granting such companies the right to use city streets with permission of the appropriate city. While the city could impose reasonable restrictions, it could not arbitrarily exclude the wires from the streets.

Practice

1. Privately owned utilities: Utilities.
2. Publicly owned utilities: State.

MICHIGAN

Judicial decisions

Detroit Edison v. Detroit, 332 Mich. 348, 51 N. W. 2d 245 (1952). A utility which has laid its facilities in alleys dedicated to the public by the original landowner can be required to bear the cost of relocating those facilities when the city desires to construct a public sewer in those alleys.

Practice

1. Privately or cooperatively owned utilities: Utilities.
2. Publicly owned gas and other pipelines: Utilities.
3. Publicly owned sewers and water mains: Usually by State (by special agreement with municipality).
4. Publicly owned electric and power and transit: State or municipality, by special agreement.

MINNESOTA

Judicial decisions

Stillwater Water Co. v. Stillwater, 50 Minn. 498, 52 N. W. 893 (1892). A utility which laid mains in municipal streets whose grade had been established but which had not yet been graded must lower the pipes at its own expense when the streets were subsequently graded, even though graded on a lower plane than had originally been established; this decision was reached despite a provision in the ordinance granting the right to the utility to lay its pipes requiring the municipality to bear the cost of relocating any pipes which the municipality might compel the company to lay in order to increase its revenue when necessitated by the change of grade of any of the streets in which these extended pipes are located.

Practice

1. Trunk highways: Utilities.
2. Municipally owned utilities:
 - (a) When highway located on local street and there is cooperative work paid for jointly by State and city:
 - (1) Existing storm sewer incorporated into new work: Cost allocated in proportion to size of drainage area served and use of any in-place system.
 - (2) Water mains and sanitary sewers: 75 percent by State and 25 percent by municipality.
 - (3) Utilities other than under (1) and (2) above: By agreement.
 - (b) When trunk highway located on new right-of-way, which only crosses local streets (no cooperative work): State.

MISSISSIPPI

Statutory provisions

All publicly owned and privately owned utilities in State highway right-of-way in urban and rural areas must be moved at expense of utility.

Judicial decisions

Willmut Gas & Oil Co. v. Covington County, — Miss. —, 71 So. 2d 184 (1954). A company which has been granted a free easement by the county over school lands can be required to pay compensation for the continued use of that land, since the State constitution forbids the giving away of these school lands and also forbids the donation of any public lands under the control of the State.

Practice

Utilities.

MISSOURI

Statutory provisions

Specified privately owned utilities in State highway right-of-way must be moved at expense of utility, unless otherwise provided by State highway commission; all privately owned utilities in right-of-way of public roads must move facilities at own expense.

Judicial decisions

National Water-Works Co. of New York v. City of Kansas, 28 Fed. 921 (C. C. W. D. Mo. 1886). A utility which has located its facilities in the streets of a city with the permission and under the direction of that city can be required to bear the cost of relocating those facilities when the city constructs a sewer in those same streets, since sewerage is a matter within the police powers.

Hannibal v. Missouri & Kansas Tel. Co., 31 Mo. App. 23 (1888). A city which has authorized a utility to locate its poles in the streets of that city cannot require the company to remove its poles without proof that they inconvenience the public.

St. Louis v. Western Union Tel. Co., 148 U. S. 92 (1893). A city can impose a tax of \$5 per pole on a telegraph company even though the city had formerly consented to the use of its streets, and even though the company had complied

with the 1886 Federal Post Roads Act giving it the right to erect its facilities in all post roads in the United States.

State ex rel. Highway Comm'n v. Union Electric Co., 142 S. W. 2d 1099 (Mo. 1944). A State highway commission cannot collect a rental from an electric company for the use of its bridge which is part of the State highway system, since the commission had not been granted the express power to impose this charge, nor does it possess the implied power, since it could not refuse permission to the company to use the bridge. Nor does the allegation that the lines interfere with the public alter this conclusion, since imposing a charge would not prevent the interference.

Practice

Utilities.

MONTANA

Practice

Utilities.

NEBRASKA

Statutory provisions

Specified privately owned utilities in right-of-way of State or Federal highways must be moved at expense of utility.

Judicial decisions

Plattsmouth v. Nebraska Tel. Co., 80 Nebr. 460, 114 N. W. 588 (1908). A city which has by ordinance authorized a utility to locate its facilities in the streets of the city cannot subsequently, after the company has expended money in reliance on that ordinance, require the company to place its facilities underground arbitrarily without necessity or the demands of public convenience.

Old Colony Trust Co. v. Omaha, 230 U. S. 100 (1913). A city cannot require a utility to remove its poles and wires from the streets prior to the expiration of the term for which it had granted permission to the utility to use the streets.

City of Chadron v. State, 115 Nebr. 650, 214 N. W. 297 (1927). A city which maintains its water pipes within the right-of-way of State highways is required to bear the cost of relocating them when necessitated by the grading and improving of these highways as part of a Federal-aid project, although it can recover from the State the cost of materials damaged by the State's negligence in failing to give notice to the city of the projected work.

Practice

1. All utilities except irrigation and drainage ditches: Utilities.
2. Irrigation and drainage ditches:
 - (a) Privately owned: Utilities, or as provided by agreement.
 - (b) Publicly or cooperatively owned: State or local government, or as provided by agreement.

NEVADA

Practice

1. All utilities (except Bell Telephone Co.): Each case is decided upon circumstances in which it is environed, with desire on part of both State and utility companies to settle amicably whenever possible.

2. Bell Telephone Co. (the most commonly recurring relocation): Ordinarily State reimburses.

NEW HAMPSHIRE

Statutory provisions

Specified privately owned utilities in right-of-way of State highways must be moved at expense of utility.

Judicial decisions

Bourget v. Public Service Comm'n, 97 A. 2d 383 (N. H. 1953). A jury's finding that a utility pole located at an intersection of two city streets was negligently placed could not be overturned by the court in an action against the utility for negligence brought by a driver who ran into that pole when blinded by another car's lights on a rainy night, even though the placing of the pole had been licensed and supervised by the city.

Practice

Utilities (State or local government might have to bear expense of relocation of poles and wires placed on right-of-way prior to 1939).

NEW JERSEY

Judicial decisions

Erie R. R. v. Board of Public Utility Comm'rs, 254 U. S. 394 (1921). The public utility commissioners of the State, acting pursuant to a statute, can validly require a railroad to bear the cost of eliminating grade crossings of its tracks and highways, and a utility whose facilities are located at the intersection can also be required to bear the cost of relocating its facilities.

New Jersey Bell Tel. Co. v. Delaware River Joint Comm'n, 125 N. J. L. 235, 15 A. 2d 221 (1940). A utility whose facilities are located in the streets of Camden with its permission is not entitled to reimbursement from the city when required to relocate those facilities during the construction of a subway over the Delaware River bridge connecting Camden and Philadelphia.

Practice

1. Privately owned utilities: Utilities.
2. Publicly owned utilities: State.
3. Any utility facilities disrupted due to grade separations or those located in a highway that is vacated or wiped out due to radical grade changes: State.
4. Publicly or privately owned facilities located on freeways or parkways: State.

NEW MEXICO

Statutory provisions

Specified privately owned utilities in right-of-way of State highways must be moved at expense of utility.

Practice

Utilities.

NEW YORK

Statutory provisions

Specified publicly owned utilities in right-of-way of State highways in urban areas must be moved at expense of State.

Judicial decisions

In re Deering, 93 N. Y. 361 (1883). The owner of land adjacent to the street cannot be required to bear the cost of relocating a gas company's pipes under the street in front of his home when the grading of the street necessitates the removal and replacement of the pipes.

New York Electric Lines Co. v. Empire City Subway Co., 235 U. S. 179 (1914). A utility which has been granted the permission of the city to lay its facilities in the streets of the city, but which has neglected to act upon this permission for a number of years, can be refused permission to make use of other conduits in the streets at a later date.

Porter v. Municipal Gas Co., 220 N. Y. 152, 115 N. E. 457 (1917). A failure on the part of a telephone company to remove its wires from the side of a building as required by a municipal ordinance which ordered them placed underground can make the company liable for damages to a person injured in a fire in that building if the wires of the company prevent a fire company from placing a ladder against the building; however, the company's noncompliance would be excused by the failure of the city to specify a location for the underground conduits.

Transit Comm'n v. Long Island R. R., 253 N. Y. 345, 171 N. E. 565 (1930). A utility which has located its facilities under the streets of a city pursuant to a franchise from the city can be compelled to bear the cost of relocating those facilities when necessitated by the elimination of a highway-railroad grade crossing, even without a statute specifically referring to the allocation of this cost.

Westchester Electric R. R. v. Westchester County Park Commission, 255 N. Y. 297, 174 N. E. 660 (1931). A utility which has located its facilities within municipal streets pursuant to a franchise from the municipality cannot be required to bear the cost of adjusting those facilities when necessitated by the construction of a county parkway, since the statute under which the project was undertaken explicitly relieved such companies of "direct or indirect" expense, loss or damage occasioned by the project.

City of New York v. Brooklyn Edison Co., 247 App. Div. 48, 286 N. Y. S. 678 (1936). (Cf. the *New York Telephone Co.* case below.) The city can recover the cost of relocating a utility's underground facilities maintained under the streets when that relocation is necessitated by the city's elimination of existing subway entrances and the construction of new ones on the sidewalks, since this was an improvement made by the city for the more beneficial use of the public highway, and was not an incident of subway construction.

O'Meara v. Postal Telegraph-Cable Co., 279 N. Y. 282, 18 N. E. 2d 157 (1938). A utility which had erected its facilities on private land without a license, consent or permission from the owner can be required by the present owner to remove its facilities from the land; it did not acquire any right to remain in that location by prescription under the New York real property law nor from the 1866 Federal Post Roads Act.

City of New York v. New York Tel. Co., 278 N. Y. 9, 14 N. E. 2d 831 (1938). (Cf. the *Brooklyn Edison Co.* case above.) The city cannot recover from the utility the cost of relocating the utility's facilities located under the streets when that relocation is necessitated by the city's elimination of the existing subway entrances and the construction of new ones on the sidewalks, since this was not a necessary part of the highway improvement, but was undertaken on behalf of the city's subway system, a proprietary function of the city.

Tilton v. State, 259 App. Div. 507, 20 N. Y. S. 2d 76 (1940). A street railway is not entitled to damages for the cost of installing temporary lines when the streets on which its tracks were located were closed during the construction of girders and bridges in the elimination of railroad-highway crossings, despite a statute requiring compensation for "damage to property not acquired."

Matter of Chestovaga, 259 App. Div. 141, 18 N. Y. S. 2d 613 (1940). An order of the Public Service Commission refusing to include cost of relocating a utility's pipelines maintained in the highways as an "incidental improvement connected" with the elimination of a railroad-highway grade crossing is reasonable, and follows the common law rule imposing this cost upon the utilities in the absence of a clear statutory mandate to the contrary.

Western New York Water Co. v. Brandt, 259 App. Div. 11, 18 N. Y. S. 2d 128 (1940). The State is not obligated to bear the cost of relocating utility facilities located in the highway necessitated by the elimination of a grade crossing of a railroad and a highway despite a statute requiring the State to bear the cost of "incidental improvements."

Petition of Gillespie, 263 App. Div. 175, 32 N. Y. S. 2d 96 (1942). A utility which is provided a substitute route by the State for its facilities involving greater annual maintenance expense than its former location in the highways can recover this cost from the board of water supply which condemned the highways in which the facilities had formerly been located, since the statute under which the board was operating exempted the owner of condemned property from all direct or indirect loss, expense and damage.

Public Service Comm'n of New York v. City of New York, 268 App. Div. 121, 49 N. Y. S. 2d 214 (1944). The State need not bear the cost of relocating transit facilities owned by the city when a grade elimination project necessitates this work, despite a statute requiring the State to bear all costs of "incidental improvements connected" with the project.

New York City Tunnel Authority v. Consolidated Edison Co. of New York, 295 N. Y. 467, 68 N. E. 2d 445 (1946). The New York City Tunnel Authority can recover from the utility the cost of protecting and relocating utility facilities located in public streets within the approaches to a tunnel constructed to carry a city highway over a body of water, since this was a public highway improvement, despite the charging of tolls on the bridges.

In re Gillen Place, 304 N. Y. 215, 106 N. E. 2d 897 (1952). A utility whose franchise right to locate its facilities under the public streets of a city was extinguished when the city closed a street in which the company had erected its facilities in order to construct a bus depot thereon falls within the terms of the statute requiring compensation for the extinguishment of franchise rights; the court held the construction of a bus depot to constitute a proprietary activity of the city, rather than an improvement of the highways.

Consolidated Edison Co. of New York v. State of New York, 276 App. Div. 677, 97 N. Y. S. 2d 431 (1950). The State is not liable to a utility for the relocation of its facilities located in the streets occasioned by the construction of temporary tracks and emergency exits during the elimination of grade crossings, despite a statutory provision making the State liable for damage to property not acquired by the State.

Nicholas Di Menna & Sons, Inc. v. City of New York, 114 N. Y. S. 2d 347 (Sup. Ct. 1952). A railroad which had erected a duct line within the streets of the city must pay the cost of supporting and protecting its line when necessitated by the city's construction of a public sewer.

Jamaica Water Supply Co. v. City of New York, 280 App. Div. 834, 114 N. Y. S. 2d 79 (1952). A private utility must bear the cost of relocating its facilities located under the streets of a city when necessitated by the city's construction of a water supply system which is a governmental function.

Practice

1. Privately and cooperatively owned utilities: Utilities.
2. Publicly owned water, sewer, and other facilities maintained for public use: State.
3. Other publicly owned utilities: Utilities.

NORTH CAROLINA

Statutory provisions

All privately owned utilities in right-of-way of State highways must be moved at expense of utility.

Judicial decisions

Elizabeth City v. Banks, 150 N. C. 407, 64 S. E. 189 (1909). A city cannot declare forfeit and collect on a bond given by the recipient of 30-year franchise from that city conditioned on completion of a gas plant within a specified time, since the city did not have the power in the first instance to grant him the franchise to use the streets for purposes other than highways; the city holds its interest in the streets (whether it be a fee or an easement in the soil) in trust for the public's use as a highway.

Raleigh v. Carolina Power & Light Co., 180 N. C. 234, 104 S. E. 462 (1920). Street railway which had obtained consent from county commissioners and from adjoining landowners to lay its tracks in a road outside the limits of a city can be required by that city to move its tracks to the center of the road after the city extended its limits to include this road, and undertook to pave and improve this road.

Practice

Utilities.

NORTH DAKOTA

Practice

Utilities.

OHIO

Statutory provisions

All privately owned utilities located in right-of-way of State highways in urban and rural areas must be moved at expense of utility.

Judicial decisions

Oanz v. Ohio Postal-Telegraph Cable Co., 140 Fed. 692 (6th Cir. 1905). A utility which has located its poles and wires in the right-of-way of a public highway pursuant to permission granted by the county commissioners, by a State statute, and by the 1866 Federal Post Roads Act can be required to relocate them at its own expense when the traffic on the highway increased, causing them to become a hazard to the traveling public.

Hardin-Wyandot Lighting Co. v. Upper Sandusky, 251 U. S. 173 (1919). A municipality can require a utility to obtain its consent before erecting additional facilities in the streets of that municipality, even though the company had erected its original facilities in the streets pursuant to an ordinance of the municipality prior to the enactment by the State of a statute requiring the municipality's consent.

Practice

Utilities.

OKLAHOMA

Statutory provisions

Specified privately owned utilities in right-of-way of State highways must be moved at expense of utility unless otherwise provided by State highway commission.

Practice

Utilities (unless otherwise provided by State highway commission).

OREGON

Statutory provisions

Specified privately owned utilities in right-of-way of State highways in rural areas must be moved by utility.

Practice

1. Utilities located outside municipalities: Utilities.
2. Privately owned utilities located within municipality: In accordance with terms of franchise agreement, but in most cases State bears cost.
3. Publicly owned utilities located within municipality: Determined effort is made by State to get utility to cooperate in cost, but in most cases State pays entire cost.

PENNSYLVANIA

Statutory provisions

All privately owned utilities in right-of-way of State highways in urban areas must be moved by utility.

Judicial decisions

Change of Grade of Kerline Street, 12 Pa. Dist. Rep. 764 (1903). A utility which has located its facilities in a public highway outside of a municipality whose grade was changed subsequent to the annexation of these highways by the municipality was required to bear the cost of lowering its facilities to conform to the change in grade.

Scranton Gas & Water Co. v. Scranton, 214 Pa. 586, 64 Atl. 84 (1906). A utility cannot recover the cost of relocating its facilities located under the streets of a municipality pursuant to a legislative grant when that municipality and a railroad construct a viaduct in those streets in order to eliminate a dangerous grade crossing, making the utility's facilities inaccessible for repairs.

Springfield Water Co. v. Philadelphia & G. Street Railway, 45 Pa. Super. 516 (1911). A utility which has located its facilities in the streets of a borough pursuant to statute and permission by that borough cannot recover from a street railway the expense of relocating those facilities necessitated by the changing of the grade of those streets when that work is done by the street railway on behalf of the borough.

Duquesne Light Co. v. Pittsburgh, 251 Pa. 557, 97 Atl. 85 (1916). A municipality which has consented to the use of its streets by an electric light company can require that company to place its wires underground prior to the repairing of the municipality's streets so that the new streets would not have to be torn up in the future.

Oil City v. Postal Telegraph Company, 68 Pa. Super. 77 (1917). Ordinances requiring a utility whose facilities are located in the streets of the city to place those facilities underground are valid as within the police power of the city.

Philadelphia Electric Co. v. Philadelphia, 309 Pa. 291, 152 Atl. 23 (1930). A utility which has located its facilities in a city's streets pursuant to a contractual agreement at a time when the city's ordinance required such companies to relocate their facilities at their own cost when necessitated by any municipal work cannot recover the cost of relocation occasioned by the city's construction of a subway.

Philadelphia Electric Co. v. Commonwealth, 311 Pa. 542, 166 Atl. 892 (1933). A utility cannot recover for the cost of relocating its facilities located in the streets of a city when occasioned by the change in grade of those streets during the construction of the Delaware River Bridge despite a statute requiring the Commonwealth and the city to contribute to the cost of construction, which the statute defined to include damages incident to the acquisition of the ground for the approaches to the bridge.

Bell Telephone Co. of Pennsylvania v. Lewis, 317 Pa. 387, 177 Atl. 36 (1935). A utility which has been granted by statute and by franchise from the county permission to construct its lines across a bridge which subsequently was made part of the State highway system cannot compel the State to grant it irrevocable permission to place its lines on the bridge as reconstructed after the former bridge had been destroyed.

Pennsylvania ex rel. Bard v. Philadelphia Electric Co., Equity, Common Pleas Court (1938). The State can require a utility to move its poles which are located on the shoulder of a widened highway which, in the opinion of the State, constitute a danger to the traveling public.

Bell Telephone Co. of Pennsylvania v. Pennsylvania PUC, 139 Pa. Super. 529, 12 A. 2d 479 (1940). A utility can be required to bear the cost of relocating its facilities located within the limits of a highway when required by a grade elimination necessitated by heavy traffic congestion.

Lewistown-Reedsville Water Co. v. Commonwealth of Pennsylvania, 49 Dau. Co. Rep. (Pa.) 18 (1940). A company which has obtained an easement to locate its facilities within the limits of a toll road is liable to relocate those facilities at its own cost when the Commonwealth takes over that pike and improves it by

changing its grade, since the company is still permitted to locate its facilities in the public right-of-way.

In Re Delaware River Joint Commission, 342 Pa. 119, 19 A. 2d 278 (1941). A utility can be required at its own expense to relocate its underground facilities located pursuant to consent ordinances of a city in the streets of that city when necessitated by the construction of a subway over a toll bridge which is part of the highway system of the State and the construction of an underpass under the approaches to that bridge.

Postal Telegraph-Cable Co. v. Pennsylvania PUC, 154 Pa. Super. 340, 35 A. 2d 535 (1944). A utility whose facilities are located in the right-of-way of a highway bordering on a municipal airport can be required to relocate its facilities, either placing them underground or on private right-of-way at a safe distance from the runways; however, since the latter course is the most practicable and cheapest, but involves the purchase of private right-of-way, the municipality which operates the airport in its proprietary capacity is obligated to bear the expense of acquiring the right-of-way and of the cost of relocating the facilities.

Philadelphia Suburban Water Co. v. Pennsylvania PUC, 168 Pa. Super. 360, 78 A. 2d 46 (1951). A utility which has located its facilities in a highway, with or without a permit, can be required at its own expense to relocate those facilities when the State vacates the highway during the elimination of grade crossings with highways in the course of the construction of a limited access expressway.

Practice

Utilities.

RHODE ISLAND

Practice

Utilities.

SOUTH CAROLINA

Practice

State reimburses for actual cost of moving unless utility is occupying right-of-way by permit (or otherwise).

SOUTH DAKOTA

Statutory provisions

Specified publicly owned or privately owned utilities in right-of-way of any public highway must be moved by utility.

Judicial decisions

Dakota Central Tel. Co. v. Shipman Construction Co., 49 S. D. 251, 207 N. W. 72 (1926). A contractor engaged in the grading of a State highway on behalf of the State is not liable in the absence of negligence to a utility for damage to its poles and wires located pursuant to a State statute in the highway right-of-way, since the State would not be liable unless it were negligent.

Practice

All utilities except municipally owned: Utilities.

Municipally owned utilities: Handled by agreement at time project is set up. Circumstances, including financial ability of city, are considered in making agreement.

TENNESSEE

Judicial decisions

Knoxville v. Africa, 77 Fed. 501 (6th Cir. 1896). A street railway which had been granted by ordinance the right to use named city streets, and which had occupied only some of those streets, lost the right to occupy the remainder of them when the city subsequently repealed the ordinance granting permission to use the streets, although this repealer did not affect any of the facilities already located in the streets.

Morristown v. East Tennessee Tel. Co., 115 Fed. 304 (6th Cir. 1902). A city cannot require a utility to remove its poles and other facilities after the company had expended money in erecting facilities in the streets of a city in reliance on an ordinance of that city granting it the right to use the streets, although the city could enact reasonable police regulations with which the company would have to comply.

Chattanooga v. Tennessee E. P. Co., 172 Tenn. 524, 112 S. W. 2d 385 (1938). A city which had granted to a utility a franchise which was not limited in time could not require the company to remove its facilities from the streets upon reasonable notice after the company had expended money in reliance upon the franchise from the city.

Southern Bell Tel. Co. v. Nashville, 35 Tenn. App. 207, 243 S. W. 2d 617 (1951). A resolution of the board of public works of the State compelling one utility at its own cost to relocate its facilities located in the city streets at a grade crossing which was being eliminated is invalid, when the board did not require other similarly situated utilities to do likewise; this resolution constituted an unconstitutional discrimination against this utility.

Nashville v. Tennessee, S. C. Tenn. (1953). A utility whose facilities are installed within the highway right-of-way can be required to move those facilities, even if they are located on private right-of-way or in the public right-of-way with permission; if the utilities would then be entitled to compensation, they would not lack a remedy, since they could recover from the county which, in turn, could recover from the State under a specific statute.

Practice

Utilities.

TEXAS

Statutory provisions

Specified publicly owned or privately owned utilities in right-of-way of State highways in rural areas must be moved at expense of utility.

Judicial decisions

Fort Worth v. Southwestern Bell Tel. Co., 80 F. 2d 972 (5th Cir. 1936). A city can impose a tax upon the easement of a utility to locate its facilities in the streets and alleys of a city.

Texas-New Mexico Utilities Co. v. State ex rel. City of Teague, 174 S. W. 2d 57 (Tex. Civ. App. 1943). A utility which has been granted a franchise for a limited number of years to erect facilities in the streets of a municipality and which has expended money in reliance on that franchise can be required to remove its facilities from the streets on the expiration of that franchise.

Practice

All adjustments of public utilities are handled by the counties and cities.

UTAH

Practice

Costs determined by agreement.

1. Privately owned utilities: License for installation provides that utility involved shall pay expense of relocation.

2. Municipally owned utilities: By agreement, parties cooperate in cost of work and materials.

VERMONT

Practice

Utilities.

VIRGINIA

Statutory provisions

Specified privately owned utilities in right-of-way of State highways must be moved by utility.

Judicial decisions

Richmond v. Southern Bell Tel. & Tel., 174 U. S. 761 (1899). A telephone company which had been granted permission to locate its facilities in the streets of a municipality with the provision that the permission could be repealed at any time can be ordered to comply with an ordinance requiring permission of the municipality for further use of its streets, despite the company's acceptance of the 1866 Federal Post Roads Act, since this latter act is permissive only, and since it applies only to telegraph, not telephone, companies.

Western Union Tel. Co. v. Richmond, 224 U. S. 160 (1912). A utility which has been granted the permission to locate its facilities in the public streets of a municipality can be required to comply with reasonable regulations imposed by the city, including the placing of these overhead facilities into underground conduits; the company's acceptance of the 1866 Federal Post Roads Act does not invest it with any positive rights which would relieve it of this liability.

Practice

Utilities.

WASHINGTON

Statutory provisions

All publicly owned and privately owned utilities in right-of-way of State highways in urban and rural areas must be moved at expense of utility.

Judicial decisions

United States v. Puget Sound Power & Light, 147 F. 2d 953 (9th Cir. 1944). The United States must pay for the cost of removing and replacing a utility's poles and power wires in the streets of a city (which the parties had stipulated to be the value of the franchise) when the United States condemns the fee simple title to the streets and adjoining lands since, under Washington law, the right to locate facilities in the streets is personal property for taxation and other purposes, not merely a contract, license or permit; furthermore, the Washington constitution requires the payment of compensation for damage to, as well as for the taking of, private property.

Western Gas Co. of Washington v. Bremerton, 21 Wash. 2d 907, 153 P. 2d 946 (1944). A municipality can compel a utility to relocate its facilities at its own expense even though those facilities were located pursuant to permission from the county in public streets originally outside the corporate limits of the municipality but which were subsequently annexed by the city; the city can also include the revenue obtained from these facilities in computing the amount to be paid to the city pursuant to the company's franchise granted by the city.

Practice

Outside municipalities: Utilities.

Inside municipalities: In accordance with terms of franchise agreement, which generally provides for payment of cost by utilities.

WEST VIRGINIA

Statutory provisions

All publicly owned and privately owned utilities in right-of-way of State highways in urban areas must be moved at expense of utility; specified privately owned utilities in right-of-way of State roads must be moved at expense of utility.

Judicial decisions

County Court v. White, 79 W. Va. 475, 91 S. E. 350 (1917). A utility whose facilities are located within the highway right-of-way can be required to move them at their own cost when they obstruct the improvement of the highway.

State Ex Rel. City of Benwood v. Benwood & McMechen Water Co., 49 W. Va. 724, 120 S. E. 918 (1923). A utility can be required to remove and relocate its facilities erected under the streets of the municipality pursuant to a franchise and under the direction of the municipality when the municipality grades and repaves the streets in such a manner that future repairs of the utility's underground facilities would interfere with traffic and disrupt the improved street.

Practice

Utilities.

WISCONSIN

Statutory provisions

Specified privately owned utilities in right-of-way of State highways in urban areas must be moved at expense of utility unless franchise provides otherwise as to cost; specified publicly owned utilities in right-of-way of State highways in urban areas must be moved at expense of abutting landowners.

Judicial decisions

Milwaukee Electric Ry. & Light Co. v. Milwaukee, 209 Wis. 656, 245 N. W. 856 (1932). A city acting in its proprietary capacity in the construction of a municipal water main cannot compel a utility which had located its facilities in the public streets pursuant to permission of the city to relocate those facilities at its own cost without an express reservation in the utility's franchise to that effect.

Practice

Utilities.

DISTRICT OF COLUMBIA

Statutory provisions

Specified privately owned utilities in right-of-way of streets must be moved at expense of utility.

Practice

1. Publicly owned utilities: Highway department reimburses the Government department concerned.
2. Privately owned utilities: District reimburses for poles, lights, and other overhead installations but not for underground conduits.

HAWAII

Statutory provisions

All privately owned utilities in right-of-way of Territorial and Federal-aid highways must be moved by utility at cost of Territorial highway department and utility; all publicly owned utilities in right-of-way of Territorial and Federal-aid highways must be moved at expense of Territorial government.

Practice

1. Publicly owned water and sewer utilities: Territory.
2. Privately owned utilities: Utilities pay first \$3,000 plus 50 percent of amount over \$3,000; Territory pays 50 percent of amount over \$3,000.

PUERTO RICO

Practice

1. Publicly owned electric and power, water, sanitary sewer, telegraph, and telephone: Department of public works pays for labor and cost of any new materials and receives credit for salvage value of removed materials.
2. Privately owned telephone and gas: Utilities.
3. Federally owned utilities: Department of public works.

APPENDIX F—STATE PRACTICES ON REIMBURSEMENT OF PUBLIC UTILITY RELOCATION COSTS WHERE BETTERMENT IS INVOLVED

State practices on reimbursement of utility relocation costs where betterment is involved, 1954

State	Practices
Alabama.....	Utility company is reimbursed for actual cost of moving plant. In case of betterment or removal of plant to an entirely new location outside highway right-of-way, company is reimbursed for estimated cost of relocating, in kind, along margin of new highway right-of-way.
Arizona.....	Highway department only bears cost of replacing facility as it was at time of change.
Arkansas.....	State does not pay for any betterment. It will pay for expenses incurred in relocating water main but not for additional cost of a larger main.
California.....	Whenever law requires State to pay cost of relocation of utility facility, credits are allowed as follows: (1) Amount of any betterment, not in excess of cost of increased capacity of facility; (2) salvage value of materials or parts salvaged and retained by company; (3) whenever new facility is provided, State is credited with accrued depreciation on displaced facility.
Colorado.....	Utilities submit estimates, which, if acceptable, are endorsed to be at cost, with credit for salvage materials and betterments. In one case, where highway users benefitted from betterment of a municipal facility, expense was borne by State and Federal Government as benefits to city were very intangible.
Connecticut.....	Estimates for furnishing and installing (1) a utility of same type and (2) utility involving betterment would be made and the difference in cost would have to be borne by owning company.
Delaware.....	Highway department does not bear cost of betterments to utilities. Policy follows GAM No. 300, modified to meet local conditions. Betterments involving publicly owned utilities are required to be paid for by local subdivision.
Florida.....	Estimates are required in advance on all major adjustments. Payment is made upon receipt of invoice after relocation is completed and approved by department engineers.
Georgia.....	Review and audit by highway department of invoices and bills are performed in sufficient detail to preclude payment by highway department for betterments.
Idaho.....	Practice is to pay cost of replacement in kind. Cost of any betterment is borne by utility company, whether publicly or privately owned.
Illinois.....	State pays cost of replacement in like size, capacity and material as previously existed. If betterment is requested, utility company pays difference in cost.
Kansas.....	Utility company is reimbursed for replacement in kind. Assuming a 10-inch line with life expectancy of 50 years which has been in place 10 years is replaced by a 12-inch line, State pays cost of placing 12-inch line and makes allowance for new pipe in an amount equivalent to 80 percent of cost of new 10-inch line. State also pays cost of removing old line and backfilling trench, and takes credit for salvage value of pipe removed. Flexibility is required to meet individual problems and prepare agreement equitable to both parties.

State practices on reimbursement of utility relocation costs where betterment is involved, 1954—Continued

State	Practices
Kentucky.....	State adopts following procedure in reimbursement to utility companies: (1) Replaces facility in kind so far as possible; (2) if impractical to replace in kind, State attempts to obtain as fair an agreement from utility company as possible, with utility company paying for betterments; (3) where uninterrupted service is desirable and to maintain such service requires the laying of a line parallel to existing one with some unavoidable benefits to utility company, State holds such benefits to a minimum and takes as much salvage as feasible. If facility is replaced by one with additional capacity, utility company pays additional cost for larger facility.
Louisiana.....	Department allows agreed estimated cost of relocating existing facility, with consideration for sacrificed life of utility and salvage value of materials retired. All costs above this amount considered betterment and borne by utility.
Maryland.....	If utility has prior rights (its own right-of-way), State pays entire cost of relocation, including any betterments or improvements.
Massachusetts.....	Reimbursement is based on cost of replacing in kind, as nearly as possible, the existing facility. Commonwealth does not participate in cost of betterment.
Michigan.....	Utility is reimbursed for actual cost of work less (1) depreciation of plant, (2) salvage value of plant retired, and (3) betterment of plant.
Minnesota.....	Utility is reimbursed for actual cost less proper credit for betterments. If new material is used, State pays either 15 percent of cost of new material or total cost of new material less salvage value of old material. In case of larger water main, State pays on basis of smaller size plus an agreed percentage of cost of labor and equipment required for new installation. Before an agreement is made regarding payment of costs for a larger storm sewer, use to be made of sewer by State is determined. Percentage of total use thus determined is used as basis for cost distribution.
Mississippi.....	Reimbursement where betterments are involved is handled in accordance with provisions of GAM No. 300. Where construction of a project necessitates change in type or location or betterment in a utility facility, utility company gives credit for materials retired at current prices of new material except as noted in the memorandum.
Maine.....	Relocations are made by the utility companies at their own expense.
Missouri.....	Betterments are handled as outlined in GAM No. 300. Difference in cost for a larger main would be borne by the utility company.
Montana.....	State reimburses utilities for actual nonbetterment costs. Where new material is used, reimbursement is made for new material, but at least 85 percent of value of old material in place must be allowed, on theory that up to 15 percent of value of material is lost in the moving.
Nebraska.....	State reimburses utilities for actual nonbetterment costs. Where width of highway right-of-way is increased, thereby necessitating utility company to install higher poles in order to maintain statutory clearance over highway, State reimburses for cost of additional higher poles. If revision of highway requires higher poles solely for providing statutory clearance, no reimbursement is made for additional higher poles.
Nevada.....	Public-utility betterment has never occurred in Nevada. If it should occur, utility company would be required to pay all additional costs caused by betterments.
New Hampshire.....	State and utility company reach agreement and State pays for that portion of cost that would represent replacement of original facility. Where poles and wires are replaced by new ones of same size, State pays cost of relocation less salvage credit of current cost new for existing poles and junk value for wire and fittings. State pays for any additional poles or for longer poles. Where untreated poles are replaced by treated poles, State pays cost of labor and equipment and of new wire and fittings but not cost of poles. Where 10-inch main is replaced by 12-inch main, State would pay full cost of excavation, laying pipe, backfill, and cost of 10-inch pipe and fittings delivered on site less salvage value of old pipe and fittings. Differences in cost for 12-inch pipe and fittings would be borne by utility company.
New Jersey.....	In general, State does not reimburse for betterments. In the case of freeway and parkway underpasses, State pays for additional facilities beyond "in kind" replacement in overpassing street or road in order to eliminate need of installing the facilities later with resultant interference to traffic. Cost of betterment borne by State would relate to bridge section only and not to approaches or any other utility construction area. In case a 10-inch water main is replaced by a 12-inch main, State would pay 10/12, or 83 1/3 percent, of actual cost. There are instances where State will pay cost of a larger service than existed in order to give a service equivalent to that of facility before relocation, e. g., where skin friction in new location would result in loss of flow if same size facility had been used.
New Mexico.....	Utility adjustment agreement provides that no payment will be made for any betterment; that the utility company will construct the most economical type of facility that will meet the same service requirements as old line; that company will keep all cost records subject to audit by highway commission and company will submit itemized bill to commission for actual costs of relocation.
New York.....	Where State pays for or reimburses for relocation of utilities, owner must pay the extra amount for any betterments or increases in size.
North Carolina.....	Betterments are handled as outlined in GAM No. 300. Difference in cost for a larger main would be borne by the utility company. Where a replacement requires entirely different types of material and classifications of labor and equipment, original line is carefully inventoried and an estimate obtained by applying known unit costs or contract prices.

State practices on reimbursement of utility relocation costs where betterment is involved, 1954—Continued

State	Practices
North Dakota.....	Utility company sustains cost incident to a betterment. If 10-inch water main is replaced by 12-inch main, State pays costs for removing 10-inch main and for placement of 12-inch main. It also reimburses utility company for difference between depreciated value of 10-inch main in place and salvage value of materials in main. Utility company sustains entire cost of material for 12-inch main.
Ohio.....	State reimburses on basis of standards of facility which existed prior to relocation. If 10-inch water main is replaced by 12-inch main, owning company is reimbursed for cost of new 10-inch main and company absorbs difference in cost of 12-inch main. Labor cost is substantially the same for both sizes and State reimburses full cost of labor.
Oregon.....	It is not general policy of State highway department to reimburse for any betterment expense. In connection with publicly owned utilities, it sometimes becomes necessary to pay for betterment in order to get the utility moved.
Pennsylvania.....	Costs of betterment are borne by utility company. Commonwealth and company agree on method of determining reimbursable costs. Depending on type of facility, reimbursement can be made as follows: (1) On pro rata basis, (2) actual cost minus betterment (if separable), or (3) on record of costs for similar past relocations.
Rhode Island.....	Reimbursements are made in accordance with GAM No. 300.
South Carolina.....	State reimburses for actual cost of relocation less proper credit for salvage value of old material and for increase in value of new installation.
South Dakota.....	Betterments are made at expense of utilities.
Texas.....	All adjustments of public utilities are handled by the counties and cities.
Utah.....	It is the intent of State to replace existing facility in as good condition as existed prior to reconstruction and to require utility company to pay for capital improvement. Cost of digging up old waterline and carefully tamping back-fill where same will be under pavement and moving to new location is often more expensive than abandoning existing line and installing new line of same size, in which case State pays entire cost.
Vermont.....	Public utility relocation is paid for by State on an equal replacement basis. Any betterment of facility is not reimbursable by State.
Virginia.....	Utility company is required to submit estimate of cost of relocation. After approval, work is authorized, and when completed, itemized bill covering nonbetterment costs is submitted to highway department. If bill is within estimate or satisfactory explanation of any overexpenditure is made, bill is paid provided a statement that bill represents actual nonbetterment costs only is signed.
Washington.....	Where betterment of utility is involved, additional costs connected therewith beyond determinable net costs of relocation to like status are borne by utility company. Adjustment is made for salvage value of installations removed.
West Virginia.....	State road commission enters into agreement with utility company concerning a proposed moving of utility facilities. Commission makes field check of estimated cost, not including betterment. After work is completed, utility company forwards detailed invoices to commission in amount of actual cost, not exceeding amount specified in agreement. Invoices provide credit to commission for salvage and unexpired life of materials together with deductions for labor related to betterment.
Wisconsin.....	Construction of a new section of line to replace an old one is usually not considered a betterment because when line is retired, all of it will be retired, including new section. If increased capacity is provided at time of relocation, utility company bears cost, which, if not otherwise ascertainable, would be arrived at by agreement with company, perhaps on pro rata basis.
Wyoming.....	Any betterment made is at expense of utility company. Agreement with utility companies reads as follows: "Sec. IV. That the company shall construct the most economical type of facilities in the new location as will satisfactorily meet the same service requirements of the old facilities in the old location and certification to this effect shall be included in its bill for reimbursement for work performed and actual costs incurred."
District of Columbia.....	In connection with municipally owned utilities (water and sewer), highway department reimburses department of District government concerned for replacement in kind, but not for betterment. District government reimburses private utilities (electric, telephone, and gas) for relocations of poles, lights, and other overhead installations, but not for relocation of underground conduits.
Hawaii.....	Entire cost of any betterment is borne by utility company.
Puerto Rico.....	Utilities prepare detailed estimates of costs of relocation, to be approved by department of public works. Utilities perform work in accordance with agreed estimate and bill department for reimbursable costs. If betterment is involved in (1) water and sanitary sewer relocation, sewer authority pays for all materials and department of public works pays for labor; (2) electric and power relocations, water resources authority pays for new materials and for proportionate cost of labor; (3) telegraph and telephone lines, publicly owned, department of public works pays for costs of labor and materials; privately owned, franchise requires company to pay all costs, but in practice, department of public works reimburses full amount; (4) gaslines, companies bear all costs.

Source: State highway departments.