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Chapter 4

PUBLIC WORKS, FEDERAL GRANTS, AND THE BUSINESS CYCLE

1 PUBLIC-PRIVATE CONSTRUCTION

The familiar and most obvious characteristic of the construction industry is its cyclical variability. Outlay on new construction was \$12.1 billion in 1926 and \$2.9 billion in 1933. The variability is even greater in new *private* construction (Table 27 and Chart 10): outlay was \$9.9 billion in 1926 and \$1.2 billion in 1933 — a relative drop of 88 percent; total construction fell 76 percent. In 1939 prices (Table 27), the drop in private construction was 85 percent and in total, 71 percent. During the 1920's private construction reached a peak, declining slowly after 1926 and rapidly after 1929. Public construction, however, continued to grow after 1926; the peak in current value was not reached until 1930, and the peak in physical volume not until 1931. But then, as the depression deepened, it fell sharply.

In the years after 1933 private construction expanded slowly and in 1940 amounted to \$5.1 billion — 52 percent of its peak in 1926. During World War II expenditure fell to \$2.0 billion (in 1943), not much above the depression low. It recovered sharply thereafter, but in 1939 dollars the volume in 1948 was 30 percent below that of 1926.

The behavior of new public construction since 1933 has been at least equally remarkable. From 1933 up to and including 1940 it grew fairly steadily, and, since private construction remained far below previous levels, comprised nearly 50 percent of total construction (instead of 21 percent as in the mid-1920's). With World War II public construction soared, reaching \$10.7 billion in 1942. It dropped sharply to \$2.4 billion — in 1945. By 1949 it had reached approximately \$6.4 billion, the highest dollar outlay in any peacetime year, though in physical volume it was below the level of four of the five years 1936-40.¹

¹ If the comparisons throughout were in real instead of money terms, the variation would be reduced, especially for the years after 1940. The tabulation indicates the most significant differences between the real and the money figures.

RELATIVE VOLUME OF NEW CONSTRUCTION

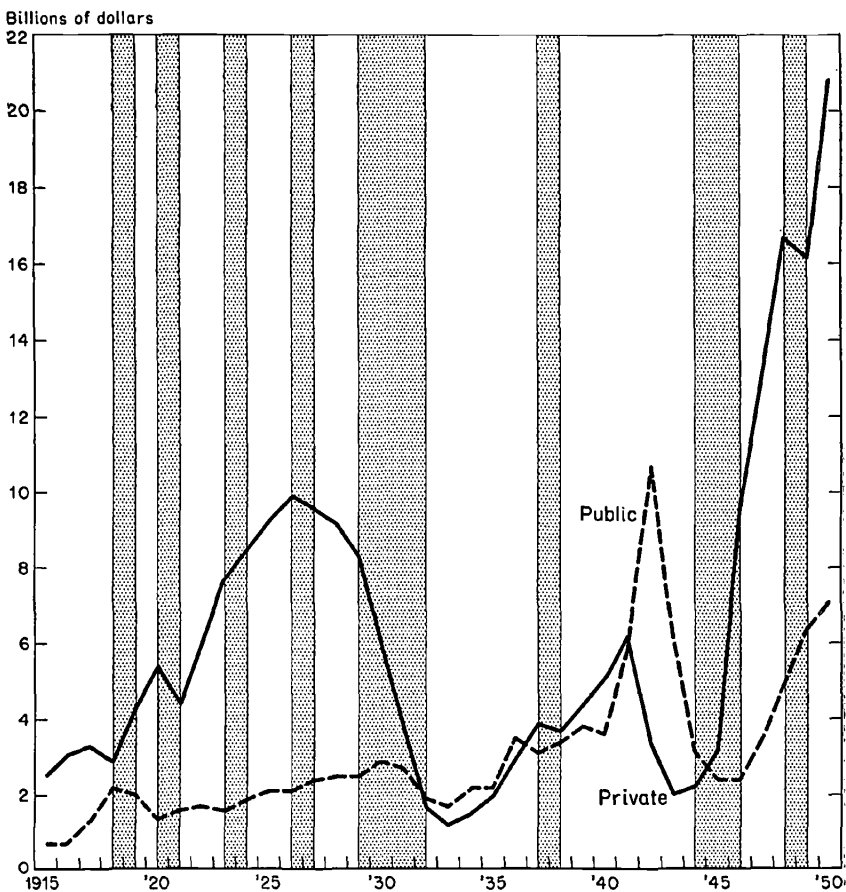
	1926	1927	1933	1940	1947	1948	1949
<i>Current Prices</i>							
Total	100	99	24	72	137	179	187
Private	100	97	12	51	132	168	163
Public	100	114	81	172	167	234	305
<i>1939 Prices</i>							
Total	100	100	28	71	82	87	94
Private	100	97	16	50	68	80	81
Public	100	116	94	183	105	128	166

Table 27: New Construction Outlay, 1915-1949

Year	Total (billions of dollars)		Public as a % of Total		Total Relatives 1926:100		Total 1939 Prices (billions of dollars)	
	Private	Public	Private	Public	Private	Public	Private	Public
1915	3.3	0.7	22	27	25	33	5.6	1.2
1916	3.9	3.1	18	32	31	33	5.9	1.0
1917	4.7	3.3	28	39	33	62	5.8	1.6
1918	5.1	2.9	44	42	29	105	5.5	2.4
1919	6.3	4.3	31	53	43	95	5.9	1.8
1920	6.8	5.4	20	56	54	67	5.1	0.9
1921	6.0	4.4	26	50	44	76	5.5	1.2
1922	7.7	6.0	22	64	61	81	7.9	1.5
1923	9.3	7.7	17	77	78	76	8.8	1.3
1924	10.4	8.5	18	86	86	90	9.9	1.5
1925	11.4	9.3	19	94	94	100	10.9	1.7
1926	12.1	9.9	18	100	100	100	11.6	1.8
1927	12.0	9.6	20	99	97	114	11.6	2.1
1928	11.6	9.2	21	96	93	119	11.2	2.2
1929	10.8	8.3	23	89	84	119	10.2	2.2
1930	8.7	5.9	33	72	60	138	8.6	2.7
1931	6.4	3.8	41	59	38	129	7.1	3.0
1932	3.5	1.7	53	29	17	90	4.4	2.1
1933	2.9	1.2	57	24	12	81	3.3	1.7
1934	3.7	1.5	59	31	15	105	3.8	2.1
1935	4.2	2.0	53	35	20	105	4.6	2.2
1936	6.5	3.0	54	54	30	167	6.6	3.2
1937	7.0	3.9	44	58	39	148	6.7	4.0
1938	7.0	3.7	49	58	37	162	6.7	3.6
1939	8.2	4.4	46	68	44	181	7.9	4.4
1940	8.7	5.1	42	72	51	172	8.2	4.9
1941	12.0	6.2	48	99	63	276	10.5	4.9
1942	14.1	3.4	76	116	34	510	10.9	8.0
1943	8.3	2.0	76	69	20	300	6.1	1.5
1944	5.3	2.2	58	44	22	148	3.9	1.6
1945	5.6	3.2	43	46	32	114	4.1	1.7
1946	12.0	9.6	20	99	97	114	7.5	1.5
1947	16.6	13.1	21	137	132	167	8.6	1.9
1948	21.6	16.7	23	179	168	234	10.1	2.3
1949	22.6	16.2	28	187	164	305	10.7	3.0
1950	27.9	20.8	25	231	210	338	12.7	3.3

Source: Department of Commerce, Bureau of Foreign and Domestic Commerce: *Construction and Construction Materials, Industry Report*, Statistical Supplement, May 1951, Construction Volume and Costs, 1915-1950; pp. 55, 58, and 60; hereafter referred to as *Construction and Construction Materials, May 1951*. Includes work relief expenditures for 1933-43.

Chart 10
New Construction Outlay, Public and Private, 1915-1950



Shaded areas represent contractions, white areas, expansions of business cycles according to NBER chronology..
Source: Table 27.

It appears, then, that the effect of public construction on the economy as a whole and on the construction industry in the great depression 1929-33 was mixed. If the downturn in economic activity had been slight, the upswing in public construction 1928-31 might have proved to be an adequate corrective. In fact the impact of the depression was not slight; in 1926-30 private construction fell much more than public construction rose, and after 1930 public construction shrank instead of expanding to offset the continuing decline in private construction.² After 1933, indeed,

² In the first two years of depression, 1930-31, public construction was stimulated by the efforts of the President's Employment Committee headed by Colonel Arthur

public construction grew and thereby added to employment, but until the war the expansion in real terms was not enough to bring the total level up to that of the late 1920's. An attempt will next be made to analyze in more detail the comparative behavior of federal and of state-local expenditure for construction.

A *Depression Shrinkage of State-Local Construction*

Public construction is divisible into (a) federal and (b) state and local. The most obvious fact brought out by Table 28 and Chart 11 is that federal construction has dominated public construction during wars. In 1918 and again in 1941-45 it was over 70 percent of the total. In the late 1920's federal construction fell to less than 10 percent, and the mild depressions of 1923-24 and of 1926-27 do not appear to have affected the federal share. But with the severe depression after 1929, the federal share rose sharply and continued at a high relative level throughout the 1930's, partly because of an absolute expansion of federal expenditures and partly because state-local expenditure remained low after 1932. It is interesting to reflect that if state-local expenditure for construction had in 1933 expanded in real terms over the 1927 level relatively as much as did federal, total construction, public and private, would have been 20 percent above the 1927 level, despite a drop in private construction to a sixth of the 1927 level.³

B *Types of Public Construction Expenditure*

Military and naval construction was relatively unimportant until 1939, then grew rapidly, being almost half of total public construction in 1942 (Table 29). After World War II it once again became the smallest of the six general types of public construction. Military and naval construction will, of course, grow and decline because of needs for national defense and only by accident will these changes operate to enlarge public construction in depression and shrink it in prosperity. Accordingly, a subtotal of public construction, excluding military and naval, is shown in Table 29.

Of the other four distinct types the most important has been highways which made up over half of the subtotal in the 1920's and up to 1934, 38-46 percent in 1934-40, and much less during the war. Next in impor-

Woods, which expanded the federal program of public works and encouraged state and local governments to follow this example, although without offering any financial assistance. This Committee encouraged also some private industries, notably the utilities, to undertake construction. The bottom fell out of plans and performance in late 1931.

³ The level of on-site employment would have been 22 percent lower than in 1927. This figure is obtained by analyzing the estimates of employment by J. K. Galbraith and G. G. Johnson, Jr., *The Economic Effects of the Federal Public Works Expenditures, 1933-38* (National Resources Planning Board, Washington, 1940), p. 40.

Table 28: New Public Construction, Federal and Nonfederal, by Source of Funds, 1918-1949

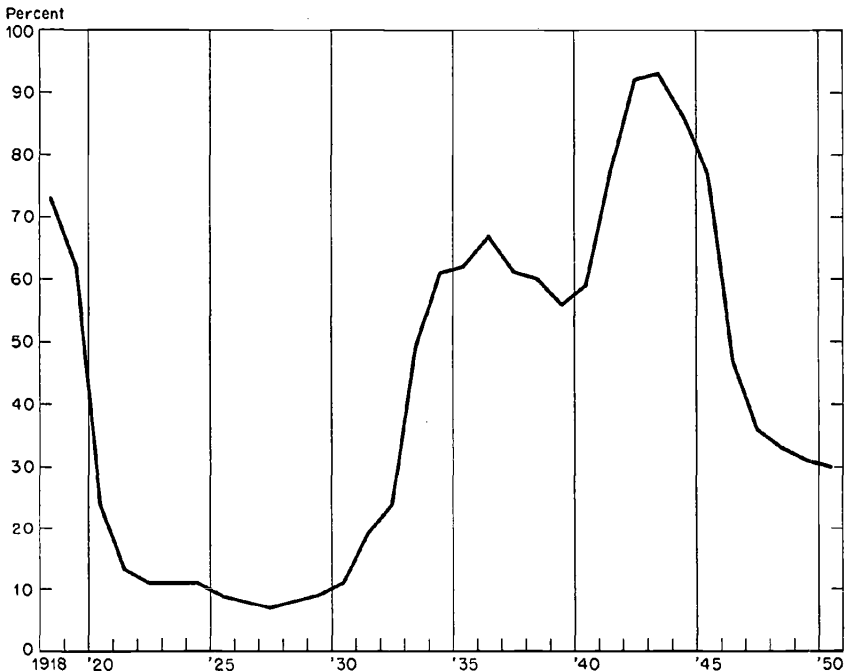
Year	Total	Highways		Residential Building		Nonresidential Building		Sewage and Water		Other	
		Federal	Non-federal	Federal	Non-federal	Federal	Non-federal	Federal	Non-federal	Federal	Non-federal
		M I L L I O N S O F D O L L A R S									
1918	2,238	1,644	594	28	..	20	179	..	94	1,585	36
1919	1,976	1,227	749	14	..	16	230	..	124	1,129	34
1920	1,352	327	1,025	..	..	11	272	..	153	217	43
1921	1,564	200	1,364	..	..	17	370	..	178	102	44
1922	1,684	178	1,506	..	..	21	460	..	201	75	51
1923	1,622	185	1,437	..	..	18	463	..	203	83	50
1924	1,901	211	1,690	..	..	13	481	..	263	89	68
1925	2,138	189	1,949	..	..	8	565	..	278	82	123
1926	2,144	174	1,970	..	..	8	595	..	285	74	115
1927	2,409	179	2,230	..	..	10	586	..	312	78	201
1928	2,485	207	2,278	..	..	14	624	..	300	97	161
1929	2,486	235	2,251	..	..	26	633	..	253	118	190
1930	2,858	313	2,545	..	..	43	617	..	343	149	190
1931	2,659	506	2,153	..	..	65	547	..	270	186	238
1932	1,862	444	1,418	..	..	133	282	..	156	179	154
1933	1,648	802	846	..	..	103	127	14	81	409	67
1934	2,211	1,347	864	1	..	125	238	69	104	615	59
1935	2,233	1,381	852	9	..	131	197	63	112	772	88
1936	3,516	2,363	1,153	61	..	390	311	211	131	882	168
1937	3,096	1,893	1,203	93	..	315	235	160	151	745	171
1938	3,420	2,037	1,383	32	3	298	374	176	179	778	159
1939	3,809	2,136	1,673	4	61	447	523	195	176	852	170
1940	3,628	2,128	1,500	4	196	405	210	129	209	1,047	126
1941	5,751	4,448	1,303	215	215	1,454	192	84	168	2,278	79
1942	10,660	9,788	872	363	182	3,569	116	174	95	5,387	40
1943	6,322	5,877	445	197	45	1,941	69	66	41	2,979	46
1944	3,073	2,631	442	203	8	1,299	62	24	55	1,014	46
1945	2,398	1,836	562	80	..	837	100	18	79	831	55
1946	2,362	1,114	1,248	309	65	156	198	5	189	438	107
1947	3,496	1,268	2,228	120	80	191	408	..	351	608	224
1948	4,907	1,606	3,301	43	113	315	986	..	535	812	247
1949	6,403	1,970	4,433	33	326	488	1,580	..	619	965	263
1950	7,113	2,136	4,977	15	330	541	1,861	..	671	1,096	249

	Federal		Non-federal		Highways		Residential Building		Nonresidential Building		Sewage and Water		Other	
	PERCENTAGE		Non-		Non-		Non-		Non-		Non-		Non-	
	Federal	Non-federal	Federal	Non-federal	Federal	Non-federal	Federal	Non-federal	Federal	Non-federal	Federal	Non-federal	Federal	Non-federal
1918	73	27	4	96	100	..	10	90	..	..	100	98	2
1919	62	38	16	84	100	..	..	94	..	..	100	97	3
1920	24	76	15	85	100	..	4	96	..	..	100	83	17
1921	13	87	9	91	100	..	4	96	..	..	100	70	30
1922	11	89	9	91	100	..	4	96	..	..	100	60	40
1923	11	89	10	90	100	..	4	96	..	..	100	62	38
1924	11	89	11	89	100	..	3	97	..	..	100	57	43
1925	9	91	9	91	100	..	1	99	..	..	100	40	60
1926	8	92	9	91	100	..	1	99	..	..	100	39	61
1927	7	93	7	93	100	..	2	98	..	..	100	28	72
1928	8	92	7	93	100	..	2	98	..	..	100	38	62
1929	9	91	7	93	100	..	4	96	..	..	100	38	62
1930	11	89	8	92	100	..	7	93	..	..	100	44	56
1931	19	81	19	81	100	..	11	89	..	..	100	44	56
1932	24	76	14	86	100	..	32	68	..	..	100	54	46
1933	49	51	33	67	100	..	45	55	..	..	85	86	14
1934	61	39	54	46	100	..	34	66	..	..	60	91	9
1935	62	38	46	54	100	..	40	60	..	..	64	90	10
1936	67	33	60	40	100	..	56	44	..	..	38	84	16
1937	61	39	47	53	100	..	57	43	..	..	62	83	19
1938	60	40	53	47	91	9	44	56	..	..	50	83	17
1939	56	44	46	54	6	94	46	54	..	..	33	47	17
1940	59	41	42	58	2	98	66	34	..	..	62	97	10
1941	77	23	39	61	50	50	88	12	..	..	67	99	3
1942	92	8	40	60	67	33	97	3	..	..	44	99	1
1943	93	7	45	55	94	6	97	3	..	..	62	96	1
1944	86	14	25	75	96	4	95	5	..	..	70	94	4
1945	77	23	18	82	100	..	89	11	..	..	81	80	6
1946	47	53	23	77	83	17	44	56	..	..	97	73	20
1947	36	64	23	77	60	40	32	68	..	..	100	77	27
1948	33	67	23	77	28	72	24	76	..	..	100	77	23
1949	31	69	23	77	9	91	23	77	..	..	100	79	21
1950	30	70	21	79	4	96	23	77	..	..	100	81	19

Source: *Construction and Construction Materials, May 1951*, pp. 18-21.

Chart 11

Federal Construction as Percentage of New Public Construction, 1918-1950



Source: Table 29.

tance is nonresidential building, then conservation and development, sewage disposal and water supply.⁴ Conservation and development grew remarkably 1926-36, declined slightly in 1937-38, recovered 1939-42, then dropped sharply to 1945. In the postwar years it has expanded rapidly. The chief components are expenditure by the Bureau of Reclamation, the Corps of Engineers, and the TVA. Its growth after 1929 helped to offset the decline in total construction for several years, but in the 1938 depression it declined. The notable feature of this series is that it indicates expansion of the area of federal construction. The other three series, highways, sewage and water, nonresidential building, show an irregular, somewhat perverse cyclical behavior characteristic of public construction as a whole (excluding military and naval). During 1930-31 expenditure for them held up or expanded, but prolongation of depression brought a sharp fall in 1932-33. The subsequent rise was interrupted in 1937. During these years highway expenditure is relatively more stable than the other series.

⁴ Two of these, nonresidential building and all other, were markedly swelled and the others reduced by war demands.

Table 29

New Public Construction by Type, 1926-1949

	Total	Military & Naval	Total excl. Military & Naval	High- ways	Conser- vation & Devel- opment	Nonresi- dential	Sewage Disposal & Water Supply	All Other
		B I L L I O N S							O F		D O L L A R S
1926	2,144	11	2,133	1,067	61	603	285	117
1927	2,409	12	2,397	1,222	63	596	312	204
1928	2,485	15	2,470	1,289	72	638	300	171
1929	2,486	19	2,467	1,266	115	659	253	174
1930	2,858	29	2,829	1,516	137	660	343	173
1931	2,659	40	2,619	1,355	156	612	270	226
1932	1,862	34	1,828	958	150	415	156	149
1933	1,648	36	1,612	847	359	230	95	81
1934	2,211	47	2,164	1,000	518	363	173	110
1935	2,233	37	2,196	845	700	328	175	148
1936	3,516	29	3,487	1,362	658	701	342	424
1937	3,096	37	3,059	1,226	605	550	311	367
1938	3,420	62	3,358	1,421	551	672	355	359
1939	3,809	125	3,684	1,381	570	970	371	392
1940	3,628	385	3,243	1,302	528	615	338	460
1941	5,751	1,620	4,101	1,066	500	1,646	252	667
1942	10,660	5,016	5,644	734	357	3,685	169	699
1943	6,322	2,550	3,772	446	285	2,010	107	924
1944	3,073	837	2,236	362	163	1,361	79	271
1945	2,398	690	1,708	398	130	937	97	146
1946	2,362	188	2,174	895	240	354	194	491
1947	3,496	204	3,292	1,514	394	599	351	434
1948	4,907	158	4,749	1,856	629	1,301	535	428
1949	6,403	137	6,266	2,129	793	2,068	619	657
1950	7,113	177	6,936	2,350	886	2,402	671	627
		R E L A T I V E S		1 9 2 6 : 1 0 0				
1926	100	100	100	100	100	100	100	100
1927	112	109	112	115	103	99	109	174
1928	116	136	116	121	118	106	105	146
1929	116	173	116	119	188	109	89	149
1930	133	264	133	142	224	109	120	143
1931	124	364	123	127	256	101	95	193
1932	92	309	86	90	246	69	55	127
1933	81	327	76	80	589	38	33	69
1934	103	427	102	94	850	60	61	94
1935	104	336	103	79	1,150	54	61	127
1936	164	264	164	128	1,080	116	120	362
1937	144	336	143	115	991	91	109	314
1938	159	564	158	133	903	111	124	307
1939	177	1,136	173	129	935	161	130	335
1940	169	3,500	152	122	865	102	119	394
1941	268	14,727	192	100	820	273	88	570
1942	492	45,600	264	69	582	612	59	597
1943	294	23,182	177	42	467	333	38	790
1944	143	7,609	105	34	267	226	28	232
1945	112	6,273	80	37	213	156	34	125
1946	110	1,709	102	84	393	59	68	420
1947	163	1,855	154	142	645	99	123	371
1948	229	1,436	223	174	1,030	216	188	366
1949	299	1,245	294	200	1,300	343	217	562
1950	332	1,609	325	220	1,452	398	235	536

Source: *Construction and Construction Materials*, May 1950, pp. 18-21.

Which level of government provides the funds for each type of expenditure (Table 28)? The catch-all category 'other', which includes military and naval, miscellaneous public service enterprises, conservation and development, and all other, has been the most important segment of federal construction since the mid-1930's. It was also most important 1918-21. Of this category, military and naval construction and conservation and development — almost entirely federal — have comprised nine-tenths. Sewage and water supply has been nonfederal, except in the late 1930's and early 1940's through PWA, WPA, and Defense Housing. Nonresidential building and highways divide more evenly. Federal expenditure for the former became as large as nonfederal in the late 1930's,⁵ but did not continue to be after the war. On highways, federal expenditure grew both absolutely and relatively after 1929 partly by greater construction of federal roads and partly by larger grants.

Federal grants for public construction moved upward with depression after 1929, and very sharply upward after 1933 (Table 30). They continued at a high level until World War II, when the discontinuance of PWA and WPA narrowed the area. Since the war there has been a new rise and the present federal aid program for public works covers four main purposes: highways, airports, hospitals, and housing. The first is of long standing and great importance. The other three are new, the amounts currently appropriated relatively small, and their treatment here will be brief. *Airports:* In 1946 Congress authorized the appropriation of \$500 million for the construction of public airports over a five year period to be apportioned among the states (except for a 25 percent discretionary fund) according to population and area. Matching was required. The federal Civil Aeronautics Administrator was permitted to deal directly with local governments in selecting and approving projects, a step that has been objected to by representatives of state governments.

⁵ During the war, with extensive federal construction of war plants, it greatly exceeded nonfederal.

Table 30

Public Construction, Federal Grants, 1918-1949 (millions of dollars)

1918	10	1926	82	1934	721	1942	475
1919	65	1927	81	1935	567	1943	268
1920	95	1928	85	1936	1,566	1944	126
1921	78	1929	80	1937	1,117	1945	99
1922	78	1930	104	1938	1,320	1946	244
1923	77	1931	235	1939	1,377	1947	422
1924	100	1932	111	1940	946	1948	430
1925	89	1933	286	1941	697	1949	480
						1950	482

Source: *Construction and Construction Materials*, May 1951, p. 18.

Hospitals: In 1946 Congress authorized also the appropriation of \$375 million to be used as grants for planning and constructing hospitals and public health centers over a five year period. Since allocation to the states is based on population and per capita income, states that are deficient in facilities and in fiscal ability receive larger sums. But all states must spend \$2 to get \$1 as a grant; i.e., the federal share is a third.

Housing: In 1949 Congress voted that the Housing and Home Finance Administration might offer capital grants to local public agencies "to make land in project areas available for redevelopment at its fair value". The grants are limited to two-thirds of the net cost of the projects assisted in the locality and the over-all grant authorization is \$100 million a year for five years.

Highways: Grants for highway construction began in 1916 under a formula that allocated funds among the states a third each according to population, area, and rural delivery and 'star route' mileage.⁶ Matching on a 50-50 basis was required. A system of federal aid mileage (not over 7 percent of the road mileage of a state) was marked out, split into interstate and inter-county; a plan of federal supervision was developed; and by 1930, 160,000 miles were eligible for federal aid.

The depression after 1929 brought both expansion and innovation. By 1941 the federal aid system had grown to 235,239 miles. In 1930-32 Congress increased the grants. With the New Deal large sums were made available for highway construction, both outside and inside the federal aid system, without matching and for purposes — secondary roads, urban roads, etc., — not previously eligible. In 1936 Congress turned back toward regular appropriations, although some depression innovations were retained. With the war, highway construction was sharply reduced.⁷

In 1944, as a part of postwar planning, Congress framed a new highway act. Highway depreciation during the war, together with the certainty of a great postwar increase in traffic, seemed to justify lifting the annual authorization (for three years) to \$500 million a year.⁸ It seemed also that in allocating grants more attention should be given to urban roads and to secondary or feeder roads; as a result, \$125 million was allocated to federal aid routes in urban areas, \$150 million for developing a federal aid system of secondary roads, and \$225 million for primary highways included in the

⁶ In 1921 and later, allocations were altered to favor states with small populations and states where the unappropriated public lands were over 5 percent of the area.

⁷ During the war the federal government made grants and spent directly for the construction of access roads and strategic highways.

⁸ The authorization in 1939 was \$200 million. The three year period for its expenditure has been extended to five.

federal aid system.⁹ The significance of this is that a large field may have been opened for expansion of federal aid. At present, however, federal grants for the construction of public works are well below the level of the 1930's. But the amount and area of *direct* federal projects has been greatly enlarged. The Bureau of Reclamation, the Corps of Engineers, and TVA together spent \$744 million for new construction in 1949.

The record of expenditure on new public construction since 1918 covers one very severe depression and several lesser depressions. For the latter — 1920-21, 1923-24, 1926-27, 1937-38 — few positive conclusions concerning the countercyclical effect of this spending can be offered. In 1921, 1927, 1930, and 1938 public construction expanded over that of the preceding year, whereas private construction fell. This is to be explained, except perhaps in 1930, by the fact that public works, financed by government and not for profit, are “less sensitive to business cycles than is privately financed building. Moreover, they are usually planned, and provision for meeting their cost is usually made, a considerably longer time before the initiation of the project than is the case with private construction.”¹⁰ Concerning the severe depression after 1929 the evidence is more conclusive. Expansion of federal works as soon as the depression started, together with moral suasion upon state-local governments, swelled public construction and reduced the drop in total construction. But after 1930, as the depression deepened, state-local ability and willingness to spend dwindled, and although federal expenditure for public works continued to grow, it was too small to offset even the decline in state-local expenditure until 1936. Unless this sequence can be altered, or depressions shortened and moderated, the applicability of a countercyclical theory is limited, since federal outlay would have to be swelled enough to offset a decline in state-local, as well as in private, construction. However, the amount and area of direct federal expenditure is much larger now than it was in the 1920's. In particular, federal outlay for conservation and development has grown. On the other hand, doubts have been expressed in many quarters that the Corps of Engineers or the officers of the Bureau of Reclamation, left to themselves, would give much consideration to a countercyclical program.¹¹

⁹ For secondary roads, rural population is substituted for total population in the distribution of a third of the \$150 million; for urban highways the distribution of the \$125 million among the states is to be on the basis of population in urban areas of 5,000 or more.

¹⁰ Gayer, *op. cit.*, p. 36.

¹¹ The Hoover Commission points out that the Corps of Engineers and the Bureau of Reclamation have frequently presented projects to Congress that were objected to by the Budget Bureau and that Congress has frequently authorized such projects. Specifically, of 42 projects turned down by the Budget Bureau, 36 were later author-

One other reflection concerns the prospect that the public program will contract after private construction has recovered. Here the experience of the 1930's is difficult to distill. Private construction then never approached the levels of the preceding decade — in 1939 it was 4.4 percent of gross national product; in 1929, 8.0 percent. And after World War II, although private construction expanded vigorously, public construction expanded even more vigorously. This situation will be discussed below.

2 FACTORS INFLUENCING TIMING OF PUBLIC WORKS

A *Influence of War Created Needs*

The possibility that public works spending be timed to offset ups and downs in business activity can be seriously limited by the economic disturbance caused by war. In 1947 there was a backlog of demands because construction of highways, sewers, schools, conservation and development projects had been curtailed in 1941-46. One may recognize that an expansive program of public works should not be pitted against private construction in years of scarcity and inflation and still be forced to admit the postwar urgency of certain public works. If the postwar years had happened to be depression years, no conflict of this sort would have arisen. In fact, however, there was great confusion of counsel and the countercyclical theory with respect to public works was buffeted by irreconcilable ideas. The federal policy actually pursued seems to have been one of compromise: construction of more public works than was compatible with the high private construction but less than was compatible with known deficiencies.¹²

B *Complementary Nature of Some Public Works*

An important premise of the construction of public works as a countercyclical or stabilizing device is that some can be postponed. Clearly, for various reasons, some cannot.

Developmental projects, such as TVA or a large bridge, once started, must usually be carried through to completion with little possibility of acceleration or deceleration.¹³ The only thing that can be postponed is the

ized by Congress (A Report to Congress by the Commission on Organization of the Executive Branch of the Government, March 1949, *Reorganization of the Department of the Interior*, p. 5).

¹² In a time of uneasy peace postponement of some types of public construction may be opposed as endangering security.

¹³ Instances to the contrary can be found. Construction of the Triborough Bridge was halted for one and a half years, 1932-33. Construction of the Panama Canal before 1905 and of the *Queen Mary*, on which work stopped for over two years, 1931-34, are instances of intermittent construction of large private projects.

initiation of the project. Construction to meet or alleviate a natural calamity can be postponed even less. An area threatened by a flood must build a levee at once. Usually, however, threats of this sort can be foreseen well in advance, and then a choice does exist as to the timing and rate of progress of the construction.

When public works are complementary to private they cannot long be postponed. A private housing development in a suburb is of little value without water and streets; highways must be constructed to accommodate motor vehicles. If all public construction were complementary, i.e., depended upon and followed private construction, countercyclical construction of public works would be impossible. But all are not and even when some are, they need not always be timed to fit in precisely with private construction. Streets can be left unpaved and still be usable for a while, private sewage is feasible in new developments, and streets and facilities for water supply can be built in advance of housing developments. Indeed, an ideal countercyclical plan might provide that part of the construction of new streets, sewers, and water supply be done in advance of private construction.¹⁴ In short, even though certain types of public and private construction are complementary, public construction might lead, lag, or be contemporaneous, depending upon cyclical conditions. Moreover, when private construction is of a type requiring some public construction in order to be usable, they could be planned together. Though private construction in the large must be undertaken when private capitalists and contractors decide, decisions concerning the timing of public construction need not be subordinated to private decisions. Local governments have long had zoning and similar restrictive laws. They might enlarge this power to ensure that decisions concerning the relative timing of related private-public construction be reached cooperatively; and this, in turn, might mean that a segment of private construction would expand and contract with public.¹⁵ A program of this sort would, to be sure, require more advance planning at the local level and assumption of more responsibility for timing by local officials. As will be seen below, this is a general requirement of the countercyclical construction of public works.

It is hard to measure the extent to which public construction is complementary to private because, for one thing, changes due to it cannot be separated from changes due to other causes. For example, while part of the decline in sewage disposal and water supply construction after 1931 may have been due to the decline in private construction of residential

¹⁴ Public works built in depression may stimulate private construction. Thus sewage disposal and waterworks may facilitate a pickup of residential building.

¹⁵ President Hoover in 1930-31 asked some industries to maintain their capital outlays. There had not, however, been cooperative planning in advance.

housing, part was due to other factors, notably the impact of depression upon municipal finances. For another thing, one cannot say precisely what private factors make public construction complementary. For example, private residential construction might seem to require public construction of streets and sewers. Yet if the houses are in a developed locality, they will not; and even if the houses are in the outskirts, private sewage and unpaved streets can be put up with for a time.

A factor reducing the significance of complementary public and private construction is that most public construction consists of replacements or improvements of existing plant.¹⁶ Segments of the plant constructed by government over the years have to be rebuilt periodically because they have worn out or become 'obsolete', broadly defined.¹⁷ People in the United States do not long tolerate an inferior public plant when better types have been devised and built. How long can construction for purposes of replacing or improving public enterprises be postponed?

C *Normal Replacement of Plant*

On the ground that a large capital plant must be "continuously renewed and replaced"¹⁸ if it is to be kept in efficient operation and if replacement

¹⁶ Consumption of construction was 71.5 percent of the gross flow, 1869-1938 (Simon Kuznets, *National Product since 1869*, NBER, 1946, p. 81).

¹⁷ The total mileage of public roads has grown less than 1 percent since 1929, although the mileage of surfaced roads has grown two and a third times and the quality of the surfacing some large (and immeasurable) amount. Government hospital beds increased 40 percent 1930-40; population 7 percent. These over-all figures indicate the importance of replacements and improvements in construction, public and private.

¹⁸ Thomas H. MacDonald, Commissioner of Public Roads, forcefully stated the criticism just examined, and the related criticism concerning normal replacement of plant, in a speech at the 32nd Annual Meeting of the American Association of State Highway Officials, December 1946: "Government has undertaken to supply certain services which cannot be provided with private capital. . . . Among such government supplied services are sewerage, water, roads and streets, public schools and police and fire protection. . . . They are to a large extent interdependent or complementary. They require certain continuing works of construction and maintenance that cannot be turned off or turned on to accord with some theoretical concept of using such works to fill gaps if private employment lags. . . . The too prevalent economic concept of holding back highway improvements to bolster unemployment, if and when unemployment appears, is a completely fallacious theory. It disregards the essential principle that highway plant, like all physical properties, is constantly deteriorating. . . . The only sound approach is to accept the principle that to avoid irreplaceable losses the highway plant must be continuously renewed and replaced."

Miles L. Colean has taken a very different position (*Stabilizing the Construction Industry*, National Planning Association Pamphlet 41, 1945, p. 15): "Actually, with important exceptions due to sudden changes in the underlying social and industrial structure, the amount of public works that must be initiated without any possibility of optional timing is probably quite limited. In most cases, three to five years would probably be the maximum time that work would need to be deferred."

is to be economical, it is sometimes denied that some public works, notably highways, can be postponed. Within limits this is a persuasive argument. Under stress of World War II, when normal replacements were postponed, some of our capital investment in roads was lost, and the poor condition of highways put added costs upon the economy. Certainly it may be less expensive (assuming prices of labor and equipment to remain the same) to make replacements at a time advised by engineers. What must be examined, however, is the degree to which all these limits are flexible. If instead of a single and closely defined point in time at which replacements must be made unless costs are to be heavy, considerable leeway exists, public works might be concentrated in depression. And even if replacement is postponed or accelerated somewhat beyond the normal, some increased costs on this account might be more than offset by general gains to the national economy.

These criticisms appear to rest upon the concept of an economy not subject to cyclical fluctuations. In it a plant would be replaced regularly. It is not an accident that the administrative procedure of the Bureau of Public Roads with respect to the payment of highway grants reflects the desire of engineers for regularizing the flow and execution of highway projects. In the best of circumstances highways require a considerable period for planning and construction. When the complication of grants is added, and the initiative lies with state governments held together by the cement of federal money, the desirability of a regularized procedure is enhanced.¹⁹ Unfor-

¹⁹ A brief description of the steps followed by the Bureau of Public Roads will illustrate. (a) After Congressional authorization of the funds for any fiscal year, they are allocated among the states according to formula. (b) The state highway departments then submit programs of projects to be constructed with these funds. After review and approval by the federal Commissioner of Public Roads, the states take steps preliminary to placing projects under construction. (c) Detailed plans, specifications, and estimates are next submitted for federal approval. (d) Bids are asked and contracts awarded, subject again to federal approval. (e) Construction is started. (f) Payments are made from state funds, federal grants being paid as a project progresses. Since the war the lag between approval (stage c) and completed payment has been 16-20 months, but it will be shortened when materials are again plentiful and competition among contractors becomes more intense. One key point in the control of expenditure is the authorizing legislation. Congressional authorization carries contract authority and appropriations follow. Another key point is approval of projects. Congressional or Executive indication that the rate of project approval be accelerated or retarded would be observed by the Bureau of Public Roads. But the Bureau tries to let the states know in advance what they can expect and to get the federal government committed to this planned program. Modification of either the program or the procedure in the light of business conditions is not envisaged.

unately the business cycle has upset the regularity engineers desire in both replacement and administrative procedure. The economist would sacrifice some of the planned regularities in an attempt to attain more over-all economic stability;²⁰ he is concerned not merely with the services rendered by completed public works but also with the effect on employment of their construction.

Perhaps the most impressive evidence on deferrability comes from examining what actually happened after 1930. New public construction of educational buildings in 1932-35 was 32 percent of 1927-30, that of municipal highways 34 percent, and of sewage disposal and water facilities 50 percent (Table 31). A similar contraction occurred during the war: new public construction of educational buildings in 1943-45 was 21 percent of 1939-41, of municipal highways 29 percent, and of sewage disposal and water supply 29 percent. These significant fluctuations meant that construction had been postponed. Perhaps postponement for counter-cyclical purposes cannot match that enforced by depression and war, but this is a matter of political decision and is not inherent in the relationships

²⁰ J. M. Clark mentions the case "of the War Department official during the Spanish War, who complained that he had gotten his Department working quite efficiently when a war came along and spoiled it" (*Economics of Planning Public Works*, G.P.O., 1935, p. 20).

Table 31

Public Construction for Selected Purposes, 1927-30 and 1932-35, 1939-41 and 1943-45

	Educational Building	Municipal Highways	Sewage Disposal and Water Supply
	M I L L I O N S O F D O L L A R S		
1927-30	1,498	1,876	1,208
1932-35	483	638	599
	P E R C E N T A G E S		
<u>1932-35</u> 1927-30	32	34	50
	M I L L I O N S O F D O L L A R S		
1939-41	782	598	961
1943-45	163	172	283
	P E R C E N T A G E S		
<u>1943-45</u> 1939-41	21	29	29

Source: *Construction and Construction Materials*, May 1950, pp. 10-2.

between public and private construction.²¹ Furthermore, a countercyclical program would not necessarily mean greater fluctuations in public construction; it would mean a different timing.

D *Building vs. Engineering Construction*

Limitations of countercyclical spending are stressed also by critics who point out broad differences between the types of construction performed by government and by private industry. They stress the difficulties of shifting labor and capital from one to the other.²² 'Engineering' works — highways, sewage disposal and water facilities, conservation and development — are predominantly public (except railroad and hydro-power construction), while building construction is predominantly private. Because of this concentration, expansion of engineering construction in depression, even if it is presumed to bring some gain in total national employment, would leave excess capacity and labor in a succeeding period of recovery. A similar problem would arise with respect to contractors, governmental organizations, and construction equipment. If contractors and governmental organizations who build and plan highways have no alternative employment, and if equipment used in constructing highways cannot economically be turned to other purposes, expansion or contraction would be unstabilizing to the industry. The conclusion is drawn that, with respect to engineering construction, the proper aim is *stabilization* regardless of fluctuations in business activity.

²¹ A great deal of new construction can be postponed because old construction can be kept in operation through maintenance and repairs. Expenditure on them is much more stable than on new construction. Whereas the latter fell in 1933 to 24 percent of the 1926 level, the former fell only to 66 percent. In 1926-29, when the level of new construction was high, expenditure for maintenance and repairs was about a third of the total expenditure for construction. Thereafter as new construction declined, the proportion rose, being above three-quarters in 1933. Again in 1944-45 when the level of new construction was low, the percentage rose above 80. This indicates that expenditure for maintenance and repairs is partly a substitute for new construction. Miles L. Colean has suggested that, as part of a stabilization program for the construction industry, government agencies might in depression stimulate private expenditures for maintenance and repairs by offering easy credit facilities.

EXPENDITURE FOR MAINTENANCE AND REPAIR AS PERCENTAGE OF TOTAL EXPENDITURE FOR NEW CONSTRUCTION, 1926-1949

1926	29	1931	47	1936	55	1941	35	1946	49
1927	31	1932	68	1937	53	1942	29	1947	45
1928	32	1933	78	1938	53	1943	51	1948	38
1929	37	1934	74	1939	46	1944	84	1949	35
1930	42	1935	70	1940	45	1945	87		

Source: *Construction and Construction Materials*, May 1950, p. 5.

²² The distinction and the argument outlined here are expounded in memoranda prepared by Robinson Newcomb, formerly on the staff of the Council of Economic Advisers.

On the other hand, planned variation in public building is desirable, since it might offset, or partly offset, fluctuations in private building. Building contractors can with relative ease shift their labor and capital from construction of factories and houses to schools and other public structures. Expansion of public building could be followed by contraction when private building picked up.

Achievement of this limited goal — countercyclical variation of expenditure for public building and stabilization of public expenditure for engineering projects — would be an improvement over performance in the past. Public building, instead of expanding, was in 1933 less than a third of the dollar volume of 1928; public engineering, instead of remaining stable, was in 1933 only three-quarters of the dollar volume of 1928. It appears, however, that the sharpness of the distinctions and conclusions should be modified.

While the broad classification of construction into building and engineering is useful, a substantial portion of engineering construction is private and of building construction is public. For the five years 1936-40, public building construction was 20 percent of total building (excluding farm) construction, and private engineering (public utility) construction was 22 percent of total engineering construction (Table 32). If labor and capital can shift *within* the field of engineering construction, the case for countercyclical variation of the public portion (at least to the extent of a fifth up and down) for the purpose of improving both the stability of the industry and the economy as a whole appears valid.

Table 32

Building and Engineering Construction, 1936-1940

	1936	1937	1938	1939	1940	1936-40
	M I L L I O N S O F D O L L A R S					
Building, total	3,039	3,603	3,461	4,501	4,825	19,429
Private*	2,278	2,960	2,754	3,466	4,010	15,468
Public	761	643	707	1,035	815	3,961
Engineering, total	2,880	2,847	2,932	3,005	2,939	14,603
Private	518	705	605	683	771	3,282
Public	2,362	2,142	2,327	2,322	2,168	11,321
	P E R C E N T A G E S O F T O T A L					
Building, total						100
Private						80
Public						20
Engineering, total						100
Private						22
Public						78

Source: *Construction and Construction Materials*, May 1950. Public engineering figures include highways, sewage and water, conservation and development.

* Excluding farm building.

Moreover, the assumption that labor and capital can shift only within the fields of building and engineering construction respectively — or at least that it is hard to shift them from one to the other — may be questioned. While earth-moving equipment is of course very important in highway construction and unimportant in building, some labor and equipment can be shifted. The possibility of transferring some unemployed labor from other industries into construction of urban highways in depression seems promising, and expansion of this type of highway construction might be in harmony with national needs.

The issues raised concerning the shiftability of capital, labor, and organization both within the construction industry, and to and from other industries, cannot be resolved by theorizing. They should, however, yield to research. And even if countercyclical spending should turn out to leave construction equipment idle in boom years, this might not be a serious objection because much of this equipment has a short life and because waste of a few types of specialized capital may be worth the gains. Possibly the important problem for which an answer should be sought concerns the shiftability of relatively unskilled labor. If in depression such labor can economically be employed in public construction, and if in prosperity it can readily be shifted to private construction or to other industries, the case for countercyclical public works spending would be greatly strengthened because, for it, mobility of labor is far more important than mobility of capital.

E *Limited Expansibility of Public Works*

Employment in the construction industry has fluctuated greatly (Table 33). During the 1930's that in private construction fluctuated most, but

Table 33

Construction Employment, 1929-1946

(average monthly number of persons, thousands)

	Total	Public	Private		Total	Public	Private
1929	2,508	511	1,997	1938	1,524	606	918
1930	2,102	615	1,487	1939	1,909	728	1,181
1931	1,759	639	1,120	1940	1,916	596	1,320
1932	1,165	568	597	1941	2,446	1,023	1,423
1933	976	524	452	1942	2,214	1,488	726
1934	1,151	613	538	1943	1,338	957	381
1935	1,292	612	680	1944	762	387	375
1936	1,763	843	920	1945	967	282	685
1937	1,778	724	1,054	1946	1,853	341	1,512

Source: Bureau of Labor Statistics, *Bulletin 786*, The Construction Industry in the United States, p. 7. Workers engaged in new construction and major additions, alterations and repairs are included; those engaged on maintenance are excluded. The series of *Bulletin 786* stops in 1943, but the *Monthly Labor Review*, August 1947, p. 202, presents figures on employment, 1941-46, that are identical for the overlapping years 1941-43, and presumably since.

after 1940 construction due to the war brought a large inflow of workers and after 1942 there was a large exodus.

In a prosperous peacetime year, workers engaged in new construction might total 2,100,000. If an effort were made to hold back public construction in such a year, possibly 420,000 workers, 20 percent, might be in public construction and 1,680,000 in private. In the event of a depression that halved the workers in the latter, the number in the former would have to expand nearly threefold in order to make up for this decline.

Is such an expansion feasible? Under pressure of war demands, employment in the public sector more than quintupled in two and a half years from February 1940 to August 1942.²³ On-site employment on PWA nonfederal and federal aid highways expanded from 75,000 in 1932 to 124,000 in 1933 and to 273,000 in 1934²⁴ — 266 percent in two years. Perhaps it is not over-optimistic to assume, supposing legislative authorization and finance have already been voted, that workers in public construction might increase threefold in a year and a half, thereby bringing employment in the construction industry back to the level of the prosperous year. If, however, employment in public construction were simply maintained, the industry as a whole would have 842,500 persons unemployed.

F *Period Required for Planning and Construction*

Public works take time to plan and construct. Planning includes “architectural, engineering, and economic investigations and studies, surveys, designs, plans, working drawings, specifications, procedures, and other action preliminary to the construction of public works”.²⁵ The United States Public Work Reserve found that the time required for plans and surveys of “a large sample drawn from 7,000 capital improvement projects” of states and localities averaged 2.39 months.²⁶ The National Resources Planning Board found that, for nonfederal PWA projects in the 1938 program, 90 percent of the contracts had been awarded within 100 days

²³ EMPLOYMENT IN PUBLIC CONSTRUCTION

<i>Feb. 1940</i>	<i>April 1941</i>	<i>Aug. 1942</i>	<i>Dec. 1943</i>
386,000	941,000	1,950,000	521,000
R E L A T I V E S			
100	244	505	135
	100	208	55
		100	27

BLS *Bulletin* 786, p. 7.

²⁴ Galbraith and Johnson, *op. cit.*, p. 40. Miles L. Colean, in illustrating his scheme for stabilizing the construction industry, assumes that a threefold expansion of new public construction could take place in the first year of depression and a sevenfold by the fourth year (*Stabilizing the Construction Industry*, p. 38).

²⁵ This definition, given in Public Law 352 (81st Cong., 1st Sess.), is approximately that of title V of the War Mobilization and Reconversion Act of 1944.

²⁶ This was the median; the mode was 1.61. Higgins, *International Labor Review*, November 1944, p. 595.

from the date of the allotment of the money.²⁷ Moreover, the kind of construction had little effect upon the interval and the size of the projects did not have a very noticeable effect, although larger projects (costing more than \$100,000) required somewhat more time to plan.

As will be argued more fully below, a good deal of this preconstruction work can be done well in advance. A shelf of projects can be prepared so that the delay in putting men to work on the site after the decision is taken to construct a project will not be long. Expert opinion holds that the danger of obsolescence in the plans is slight. "If the projects are selected intelligently and represent a continuing need, and if the plans are made by competent technicians and checked after the preliminary stage, there is no reason to anticipate any substantial loss through obsolescence, variations in taste, new inventions, or higher standards."²⁸ Advance planning also enables localities to finance public works at lower cost because complete and thorough consideration of blueprints and specifications, with the benefit of federal criticism and suggestions, should eliminate the need for changes while the project is being built. It should, moreover, enable localities to get lower bids from contractors or lower rates from lenders who will finance the projects. The significant advantage, however, for purposes of this study is that advance planning cuts the time necessary to get on-site construction started.

How long does it take to construct public works after the contract has been let, assuming the site has already been acquired? There are two phases: the engineering planning phase, i.e., preparation of working drawings and specifications, and the construction phase. The National Resources Planning Board found that, for nonfederal construction, the former averaged 48 days and that the most important factor was "the time of the year when contracts are awarded".²⁹ For awards in the winter, November to February inclusive, nearly twice as many days elapse before construction starts as for awards in other months. This interval between contract award in winter and the start of construction was much more important for highways than for other types of project. The seasonal delay cannot be reduced by advance planning, but delay due to preparation of working drawings and specifications can.

The length of the construction period depends more upon the size than the type of project. Small projects, \$10,000-50,000, take on the average 10 to 30 weeks; water facilities, sewers, and streets take less time than buildings and bridges. Large projects, \$500,000-1,000,000 take on the

²⁷ Galbraith and Johnson, *op. cit.*, p. 78.

²⁸ *Task Force Report on Public Works*, Appendix Q, p. 7.

²⁹ Galbraith and Johnson, *op. cit.*, p. 84.

average 57 to 89 weeks and the differences in average time according to type of project are relatively narrow (Table 34). This indicates that a shelf should include projects of different size, but that a variety of types is not necessary to assure flexibility in terms of the average period. In 1942 state and local projects took 5-7 months to construct on the average (Table 36).³⁰ As would be expected, smaller projects reach peak employment quickly. Those costing up to \$50,000 reach a peak in the second month and those costing \$50,000-99,999 in the fourth month. The more costly the project, the later and less marked the peak.³¹ Table 35 gives similar information about low rent housing projects.

The administrative, political, and legal mechanism involved in getting public money also takes time. The controls governing the appropriation of public funds are complex and few could be eased except by altering the procedure. Congressional authorization and appropriation is time consuming, and construction appropriations, federal and nonfederal, are not now gathered in one bill. They could, however, be combined and Congress could, if it chose, give legislative priority to this bill. Or Congress could

³⁰ Higgins, *Public Investment and Full Employment* (Montreal, 1946), pp. 140-1. The mode was 4.92 months, the median 6.90 months.

³¹ Galbraith and Johnson, *op. cit.*, pp. 97-8.

Table 34

Average Number of Weeks Required to Complete Various Types of Nonfederal Projects of Different Size

	COST OF PROJECT (thousands of dollars)							
	10-24.9	25-49.9	50-74.9	75-99.9	100-249.9	250-499.9	500-749.9	750-999.9
Water mains	10.8	16.0	21.6	28.0	33.4	43.6	58.0	67.3
Storm & combined sewers	12.7	16.2	22.8	29.2	39.7	48.4	57.8	69.0
Water storage	13.0	22.0	27.4	28.6	30.4	46.3	57.6	69.4
Water works & sewers	13.8	23.3	28.8	34.2	43.6	57.9	60.4	73.2
Electric distribution & power plants	15.4	21.6	26.0	32.9	40.8	49.7	62.3	74.0
Streets & highways	15.4	18.9	23.0	27.9	33.2	42.0	59.0	69.0
Sanitary sewers	15.6	19.6	26.3	36.0	42.4	52.3	58.4	66.2
Sewage disposal	18.1	25.1	33.8	39.5	48.0	61.3	75.5	87.5
Waterworks	18.3	27.1	32.7	37.6	43.3	56.3	63.3	71.0
Gas plants	18.8	22.6	24.8	27.3	39.2	48.6	60.3	72.0
Power & waterworks	19.0	28.8	37.9	40.0	45.8	63.4	78.2	89.0
Hospitals	19.6	30.5	37.8	43.3	58.8	66.0	75.8	81.9
Bridges	19.6	26.4	35.9	39.1	43.6	60.1	72.4	83.8
Colleges & universities	19.9	29.3	39.8	45.3	49.1	57.6	63.7	75.0
Filtration plants	19.9	24.4	29.4	33.2	42.8	51.2	64.5	76.3
Public buildings	20.4	28.9	36.0	45.3	48.5	64.2	74.4	86.0
Secondary schools	21.0	29.1	33.1	39.0	45.1	61.8	69.8	79.7

Source: Galbraith and Johnson, *op. cit.*, p. 89. Based on an analysis of the construction of 7,893 nonfederal PWA projects completed in 1934-39. Elapsed time is measured from the date construction starts to the date when all work is in place.

Table 35

Average Delay in Months for Low Rent Public Housing Projects

Type of Project	Size by Developmental Cost (\$000)	From Contract Award to Final Completion (months)
Normal	100- 500	13
	501-1,000	13.5
	Over 1,000	16.8
Defense	100- 500	8.0
	501-1,000	11.0
	Over 1,000	15.2

Source: Sherman J. Maisel, *Timing and Flexibility of a Public Works Program*, *Review of Economics and Statistics*, May 1949, p. 149.

provide a continuing appropriation or advance appropriations to be spent under specified conditions or at the discretion of the Executive. Some flexibility could be assured by voting part of the appropriation as a lump sum to be allocated by the Executive. Precisely what measures are desirable to ease the problem of legislative inflexibility calls for a political rather than an economic judgment, but it is certain that existing procedures are formidable obstacles to quick action.

Legislative and legal hurdles to state and local appropriations are even more serious. The appropriation process in itself is not ordinarily very time consuming at the local level, but may be at the state because of the infrequency and limited duration of legislative sessions. More important are the legal and constitutional restrictions on borrowing. In terms of countercyclical construction of public works they are a serious obstacle.

Table 36

Estimated Duration of Capital Improvements Projects Submitted to the U.S. Public Work Reserve, Percentage Distribution

	Construction	Plans and Surveys	Total Time Required
Less than 2 weeks	0.3	26.3	0.2
1- 4 months	42.2	66.5	29.4
5- 8 months	26.9	5.0	31.5
9-12 months	18.3	1.8	15.0
13-16 months	1.7	..	10.8
17-20 months	1.8	0.2	2.6
21-24 months	4.6	0.2	1.8
25-28 months	0.4	..	2.7
29-32 months	0.4	..	1.8
33-36 months	1.0	..	1.0
37-40 months	..	..	0.5
41-44 months	..	..	0.2
45-48 months	0.3	..	0.5
More than 4 years	2.1	..	2.5
	100.0	100.0	100.0

Source: Higgins, *Public Investment and Full Employment*, p. 141.

3 COUNTERCYCLICAL SPENDING AFTER 1930

Each criticism so far examined has some validity and serves to emphasize practical impediments to countercyclical spending for public works. The experience of the 1930's is examined in an attempt to discover the manifest defects of public works spending.

Part of the explanation is that the theory was not understood. Herbert Hoover, when Secretary of Commerce, had endorsed cyclical planning of public works and in 1930 the federal government expanded its own program and encouraged state and local governments to follow its example although without offering them financial assistance. But this effort soon bogged down. President Hoover and his advisers, as well as many influential members of the Democratic Party, became convinced that the biggest obstacle to recovery was an unbalanced federal budget.³² A corollary was that any expansion of public works should be accompanied by higher federal taxes; and since higher taxes would tend to diminish employment in private industry, a spending policy was not launched. Yet the logic of the expansion of public works spending in depression is that it should be financed by creating debt rather than by taxing. After 1933, of course, it was. But other and more practical difficulties soon became apparent.

It is not easy to get thousands of governments to cooperate about anything. Cooperation in construction is peculiarly difficult because it is carried on by many governments, often small, in response to diverse needs, and because projects require time to prepare and execute. To handle this complicated task there was, in 1933, almost a complete lack of administrative preparation. More specifically, four deficiencies are discernible: no effective organization existed at the federal level; no organization existed at the state-local level; little advance planning had been done; projects had not been classified by deferrability.³³

³² The Democratic platform of 1932 declared for "maintenance of the national credit by a Federal budget annually balanced". Senator Carter Glass, perhaps the most influential spokesman of the Party on financial questions during the presidential campaign of 1932, attacked the Hoover administration for an unbalanced budget.

In the middle of 1932 President Hoover said (*Congressional Record*, Vol. 75, p. 10959): "It is generally agreed that the balancing of the Federal Budget and unimpaired national credit is indispensable to the restoration of confidence and to the very start of economic recovery. . . . A public works program . . . through the issuance of federal bonds, creates at once an enormous further deficit."

³³ This summary statement rests on the conclusion that the efforts at organization by the Employment Committee (1930), the Federal Employment Stabilization Board (1931), the President's Organization for Unemployment Relief (1931) accomplished little; see, e.g., Higgins, *Public Investment and Full Employment*, p. 149; Williams, *Grants-in-Aid under the Public Works Administration*, pp. 12-22, 163.

A *Relief and Work Relief: FERA and WPA*

The argument over federal responsibility for action concerning unemployment and relief was resolved in spring 1933 when a new administration took office. Congress soon assumed a larger but undefined responsibility for direct relief, work relief, and public works.

The Federal Emergency Relief Administration, set up in May 1933, was designed to cope with the problem of relief. It operated as a grant system, but the great difference between it and any other grants was the wide discretionary power given the federal administrator. Funds made available to FERA in 1933-37 totaled \$3,100 million with no specific and formal requirement for state-local contributions because Congress did not know either the extent of the need or the fiscal abilities of the states.³⁴ The federal administrator, in addition to his great power in allocating grants and determining the amount of the state-local contribution, had wide powers of supervision which he exercised vigorously. Among other things he tried to push state-local governments away from direct relief and toward work relief. This raised a major difficulty because in the spring of 1933 most states and localities favored direct relief. Work relief put a heavier burden upon their depleted treasuries, required discovery and appraisal of suitable projects, and raised serious questions of administration and supervision.

As a result, a feeling grew up at Washington in favor of a program of work relief that would be completely federal. The Civil Works Administration, set up in November 1933, was the outcome. In the fiscal year 1934 it spent \$987,000,000 for work relief, of which 91 percent was federal money.

The administrator, meanwhile, had trouble in developing a sound grant technique for FERA. Friction arose over standards of relief, supervision, appointments, and the state-local share of expenditure. Because of state-local pressures the federal share rose from 60.6 percent in 1933 to 74.4 percent in 1935; the state shares ranged from 35 to over 95 percent. As time passed, the discretionary power given the administrator tended to undermine the administration of relief (see Ch. 3).

The President announced a new federal program on January 4, 1935.

³⁴ The appropriation of \$500 million in the original act of May 1933 was split into two equal parts, one to be distributed at the discretion of the administrator and the other so that each state would receive \$1 as a grant for every \$3 of state-local money spent for relief. After October 1, 1933, however, any unexpended balance of the latter could be shifted over to the discretionary basis, and this in fact was done. Subsequent appropriations put grants on a discretionary basis, but the administrator always attempted to require that state and local governments contribute according to their financial ability.

A rough line was to be drawn between employables and unemployables, the latter becoming a state-local responsibility, except that certain categories were to be aided by federal grants. To care for employables a new federal agency, the Works Progress Administration, was to be created. It was to provide work relief, not through grants, but as a federal scheme modeled upon the earlier CWA. However, although WPA expenditure for nonfederal purposes was through federal, not through state-local officers, it was much closer to grants than to federal expenditure for ordinary federal purposes. Sponsorship of projects to WPA was by state and local governments, much as projects were recommended to the Bureau of Public Roads for grants; responsibility for the supervision of the construction of accepted projects was placed largely upon the sponsors; the sponsors put up part of the expenditure — until 1939 an amount dependent on the discretion of the administrator and thereafter at least 25 percent on the average; finally, WPA expenditure on nonfederal projects relieved state-local budgets.

WPA projects were diverse in type, but construction expenditure predominated — it was over three-quarters of the total — with expenditure for highways, roads, and streets constituting half.

An important aspect of WPA for present purposes is the division of costs of projects between the sponsor and the federal government. As it turned out, actual sponsor contributions varied widely, and some well-to-do governmental units were more successful at evading their financial responsibilities than were the poorer units.³⁵ Congress became convinced that the root of the matter was the broad discretionary power given to the administrator and in 1939 stipulated that not less than 25 percent of the total cost of nonfederal projects approved to be undertaken in any state was to be borne by the sponsors.

B PWA

The Federal Emergency Administration of Public Works was set up in June 1933 to promote nonfederal construction by grants and loans, the grants until 1935 being approximately 20-25 percent of the total cost of a project, and 45 percent thereafter.³⁶ It was authorized to deal with local as well as state governments. Perhaps three-quarters of the public works that might be stimulated by federal grants (and loans) were the responsi-

³⁵ Evidence for this statement is summarized in J. A. Maxwell, *The Fiscal Impact of Federalism in the United States* (Harvard University Press, 1946), pp. 153-8. For example, of the 24 states in which the largest WPA expenditure (excluding sponsor contributions) per capita was made through June 30, 1940, 8 were below and 16 were above the median in per capita income, 1938-40.

³⁶ PWA spent also for federal construction, but this will not be considered here.

bility of local governments, and few states had a single department connected with or informed about these works. To operate only through state governments would have meant delay or even complete inaction. Since PWA was to operate on the basis of projects, no formula in the law specified the total allotment for any state. PWA itself gave some attention to geographical distribution, but in general argued that expenditures by states reflected only 'direct' benefits. No matter where the actual expenditures were made, advantages accrued to the nation not to be measured in geographical terms, especially since PWA was not a work relief agency.

A significant aspect of the experience of PWA was the delay in getting the nonfederal program started. Although PWA in 1933 had an appropriation of \$3,300 million, eighteen months passed before 100,000 people were at work on the site.³⁷ Few plans and specifications had been prepared in advance, and the administrator, Harold Ickes, who wished to avoid pork-barrel expenditure, set up a highly centralized procedure and administration to screen projects and make decisions. Greater speed was gradually achieved, but up to June 30, 1941 total nonfederal construction expenditure was only \$4,144,200,000 — nearly \$1,750 million less than the comparable expenditure of WPA.

The difficulty experienced by PWA in getting the information it desired concerning projects focused attention upon and gave explicit content to the idea of advance planning. Many states and localities not only did not have, but did not know how to prepare, important information concerning the legal, engineering, and financial aspects of a project, sometimes because their engineering forces had been reduced in the depression, but often because of sheer inability. In the early months of PWA fewer than half of the nonfederal projects sent through the clearing house of state engineers to Washington were finally approved.³⁸

It must not be thought, however, that lack of advance preparation was the sole reason expenditure on public works did not expand. Before PWA a few local governments had plans for public works which collapsed after 1930 for financial reasons.³⁹ And constitutional and statutory limitations

³⁷ Testimony of Major-General Philip B. Fleming, 78th Congress, 2d Session, House Hearings before the Committee on Roads, *Federal Aid for Post-war Highway Construction*, Vol. 2, p. 933. "We had nothing prepared then but dreams and idle fancies, and it was 18 months before we had 100,000 people at work on the site. That was because there were no plans or specifications ready. . . . We had to create CWA and WPA which followed it. I think if we had plans and specifications we would never have gone through the days of CWA and WPA. . . ." It should be remembered that this comment refers to the nonfederal program of PWA.

³⁸ Gayer, *op. cit.*, p. 114.

³⁹ Detroit is one notable example; *ibid.*, pp. 170-4.

upon state-local borrowing sometimes prevented PWA from overcoming financial obstacles. PWA made loans at the flat rate of 4 percent on the basis of 'reasonable' or 'acceptable' security, but found few borrowers until state and local governments extended their borrowing power through use of revenue bonds, secured by the revenue from the project they helped to create. Since such a bond does not put a burden upon ordinary governmental revenues, it has been held to be outside debt limitations. Encouraged by PWA, authorities issuing revenue bonds multiplied rapidly and so did the type of project financed by them. Besides toll bridges and utilities, there were golf courses, swimming pools, dormitories, etc., which were self-supporting because 45 percent of their cost was covered by an outright federal grant, leaving only the remainder, or part of it, to be covered by a loan. To a large extent, PWA sold, chiefly to the RFC, the bonds purchased originally by it, and emerged from its ventures with very small losses.

In brief, while federal grants for construction are now confined to a small part of the total field, precedent is abundant for expansion and offers some guidance concerning what might and might not be done in the future.

1) If in a future depression the federal government is impelled to expand its expenditure for nonfederal construction, and if events allow it to choose, informed opinion seems to favor public works over work relief.⁴⁰ In terms of damping cyclical fluctuations, public works are preferable because Congress cannot be expected to tolerate a work relief scheme during prosperity.⁴¹

2) The experience of PWA is, therefore, important. Preeminent in this experience is the lesson that no scheme for countercyclical expenditure on public works has a chance of success unless state and local officers are carefully trained in advance. Desirable projects are sometimes not eligible for federal money because not enough is known about them. A reservoir

⁴⁰ In work relief workers are taken from relief rolls and in the selection of projects preference is given to those which permit a large use of labor organized on force account rather than on contract work. An emphatic opinion in favor of public works is expressed in the *Task Force Report on Public Works* (p. 5), and similar expressions by Congressional leaders and federal officials could be cited. Yet depression might well change opinion as the relative cheapness in terms of governmental expenditure of work relief compared with public works was realized.

⁴¹ Recovery brings special difficulties for a work relief program. The task of providing projects that fit the skills of the unemployed is aggravated because the best workers move to private employment and because the total unemployed shrinks. Yet curtailment of the program is not easy because the need of those remaining on the payroll is obvious.

of state-local projects of tested value is unlikely to be created and maintained without continuous federal leadership.

3) Advance planning by itself, however, is only an essential preliminary to the vital problem of finance. When confronted by severe depression state-local governments as a whole have not had and cannot be expected to develop the fiscal ability to expand countercyclical spending. The few that are strong enough tend to hold back because expansion or contraction by them can affect the level of income and employment within their own area to only a limited degree. Financial assistance from the federal government by grants and loans has been suggested as a technique for getting concerted action by all levels of governments.

4) Financial assistance is made more necessary, yet more difficult to render, by the thicket of constitutional and statutory limitations surrounding state-local ability to spend and to borrow. Their removal is bound to be a slow process which cannot be accomplished after depression strikes.

5) Within states consolidation of the control of public construction by state governments, and centralization of state controls over that of local governments, would allow federal grants and loans for construction to be allocated through state organizations. But again this process, if accomplished at all, can go forward only slowly. For the present some federal-local contacts seem inevitable in a countercyclical scheme.

4 POSSIBLE MODIFICATIONS

A *Centralization of Federal Construction*

Looking to the future, some students think that the initiative in framing a public works program for all levels of government must come from the federal government:⁴² it alone can take an over-all view, it alone has the financial resources, and it alone, not any other level of government, is responsible for trying to moderate cyclical swings. As a first step coordination of its own public works activities has been suggested. The Colmer Committee believed that "to keep its own house in order, the Federal Government should clear the actual commencement of approved Federal projects through a public-works authority concerned with national policy. Each Federal agency which has appropriations for construction should, before actually undertaking construction, have the program cleared as to

⁴² The *Task Force Report on Public Works* stated that "the advance planning and promotion of public works . . . should be recognized as a continued responsibility of the Federal Government, working in cooperation with States and municipalities" (p. 4). Gayer, writing in 1935, said (*op. cit.*, p. 357): "If the adoption of the principle of planned elastic construction expenditures were deemed desirable, the problem would thus become one, first of the Federal government taking the initiative, and next of encouraging or inducing local governments to follow its example."

its timeliness. The clearance should be not only on the basis of the value of the project but also with due regard to the state of employment in the construction industry and the state of the business cycle."⁴³ Upon such a federal authority would fall the task of seeing that public works were planned in advance, classified according to deferrability, and accelerated or decelerated according to cyclical conditions. The operative obstacles, especially to postponing federal construction in prosperity, are serious. Federal officers directly interested in federal projects have always felt that their primary duty is to push toward initiation and completion as rapidly as possible. Political pressure operates in exactly the same direction (see note 11). Against pressures of this type the sole defense is the general interest of the nation in a countercyclical program.

Since federal construction in 1948 was less than a third of total new public construction, its centralization would not directly affect the other two-thirds which are, and may be expected to remain, a responsibility of state and local governments because they know state-local needs and are in a position to exercise effective administration. But recent history indicates that their ability in severe depression to carry the financial responsibility is questionable.⁴⁴ The two-thirds cut in their expenditure in the three years after 1930 contributed to deflation in the nation and acute disturbance in the industry. And the reason was primarily fiscal. If federal intervention could induce state-local governments to postpone expenditure when private construction is active and to bring it forward in the opposite situation, the construction industry might be stabilized and a contribution made toward general economic stability.

In terms of both precedent and promise the grant-in-aid will appear to many people to be an acceptable and effective lever to enlarge federal cyclical control over state-local expenditure for construction.⁴⁵ Such

⁴³ 79th Congress, 1st Session, *House Report 852*, Postwar Public Works and Construction, p. 34. In this quotation clearance of both a program and projects is suggested. One may doubt that the latter clearance is desirable. Experts in the several fields should be better judges of projects than a central agency. The central agency might find it wise to avoid making specialized and technical judgments for the operating agencies.

⁴⁴ "There is not," according to the *Task Force Report on Public Works*, "a State, city, or municipal subdivision in the country which can, on its own, finance a depression-construction program sufficient to make a real dent in the employment problem. Federal assistance is required" (p. 6).

⁴⁵ A more abstract justification of such grants would, as in the case of welfare grants, run in terms of a national minimum. If state-local governments could at all times establish and maintain a level of highways, etc. adequate to meet national requirements, federal grants would be unnecessary. But if, because of depression, or because even in good years what they budget is inadequate, the federal government might be prepared to allocate enough money so that this, when added to state-local expenditures, would provide an acceptable national minimum.

grants might be of two types: grants for planning and grants for state-local construction projects of every type that have been planned and cleared in advance.⁴⁶

B *Grants for Planning*

Until plans and specifications have been worked out, contracts prepared, and bids asked, the mere availability of an appropriation will not put men to work on a project. The wisdom of advance preparation of a shelf or reserve of projects led Congress by Title V of the War Mobilization and Reconstruction Act of 1944 to authorize \$65 million to be allocated as advances among state and local governments for planning public works. The advances were to be repayable without interest whenever construction was undertaken. The authority to make advances ended on June 30, 1947 and Congress did not extend or enlarge it. By this date approval had been given for the preparation of plans for 7,338 projects, which, if constructed, were estimated to cost \$2,400 million. Planning had been completed on 5,827 of these projects. By June 30, 1949, 1,540 projects, chiefly for sewage, water, and sanitation, had been placed under construction, thereby reducing the value of the shelf \$400 million.⁴⁷

In October 1949 a new and similar measure was enacted. Repayable advances not to exceed \$100 million for a two year period were authorized. These were to be allocated among the states, 75 percent according to population and 25 percent according to need as determined by the Administrator of General Services. It was estimated that this would enable \$3 billion of new state and local public works to be planned.⁴⁸ The new measure was aimed less than its predecessor at building up a shelf of projects that might be started in the event of depression because of a provision that, if construction of a project is "not undertaken or started within three years after

⁴⁶ J. M. Clark in his *Economics of Planning Public Works* (p. 122) declared that a coordinated scheme of public works justified the federal government "in making subsidies not only to the actual carrying out of the projects but to the advance work of planning and preparation to whatever extent may be necessary in order to induce the states and localities to make their advance planning really effective".

⁴⁷ See 81st Congress, 1st Session, *House Hearings before the Committee on Public Works on HR 5739, Advance Planning of Public Works* (Washington, 1949), pp. 12-61.

⁴⁸ As of May 31, 1950 advances of \$8.5 million had been approved, covering 483 projects estimated to cost \$286 million. Over two-thirds of the approvals were of sewer facilities, and school and other educational buildings. Applications under review, but not approved, covered 897 projects estimated to cost \$876 million. The war in Korea caused the measure to be converted toward planning of defense-related projects and convinced the Executive that further extension of the program should not be asked (*Budget of the United States Government, Fiscal 1952*, p. 985).

the full amount of the loan or advance therefor has been made", the Administrator shall investigate the situation and may demand repayment of the loan (Public Law 352, Sec. 2). As a result the projects planned tended to be those for immediate construction. The concept of a shelf was pushed into the background. The justification of the three year limitation was that a shelf may become obsolete and money spent on plans may, therefore, be lost. Against this loss, however, one should set the gain that comes from preparation for accelerated construction of public works in depression.

The brief experience with advance planning under Title V offers a few conclusions. Most small governmental units, roughly those with populations under 50,000, do not even have plans in the design stage because they lack authority, money, and staff with technical ability. A surprising number of large units are in little better position. Without strong federal stimulus it seems unlikely that state and local governments will plan ahead adequately. The *Task Force Report on Public Works* of the Hoover Commission declared (pp. 5-6): "Few States and municipalities are geared to turn out detailed postwar public works plans and specifications within any reasonable time, even assuming they know what they want to do and have public as well as official opinion back of their program. With a few notable exceptions they lack sufficient regular engineering design forces."

If the federal government is to stimulate and coordinate efforts toward advance planning, a more generous and continuous program may be required. Since the emphasis of such a program would lie not simply in encouraging planning but in planning deferrable projects, outright grants might be offered to cover part (perhaps half) of the planning cost of approved projects so classified, while repayable advances might be offered for other acceptable projects.⁴⁹ A debatable issue is how far the federal government should deal directly with local governments. The Colmer Committee preferred federal-state arrangements and, as a long run scheme, this has the advantage of decentralizing public works planning so that the federal government would have to deal with only 48 governments instead of with thousands of local governments.⁵⁰ Unfortunately, some states are bound to be slow in setting up a system that would adequately reach their local governments, and in such cases the Task Force on Public Works of the Hoover Commission has suggested direct federal-local contact as an

⁴⁹ The basis of allocation of Public Law 352 is state population for 75 percent and administrative discretion for 25 percent of the total. A limit might be set on the allowable planning cost of a project, probably as a percentage of total estimated cost. The Bureau of Public Roads has allowed 1½ percent for planning.

⁵⁰ *Postwar Public Works and Construction*, p. 35.

alternative.⁵¹ The latter seems to have special merit for metropolitan centers.

C *Construction Grants*

Success in extensive advance planning and selection of deferrable projects would, of course, not necessarily induce state-local governments to enlarge and accelerate their public works spending with recession and to curtail and retard it with prosperity. For those purposes a federal grant program covering the whole area of state-local construction may be necessary. According to one approach, administration of such a program as well as of direct federal construction would be centralized in a Public Works Agency. Another approach would leave administrative responsibility in the appropriate functional federal department. In the latter case, however, decisions concerning the timing of both direct federal construction and the grant programs would be centralized in a board of review (see Sec. 4E). In both cases the aim would be so to direct the volume of public construction as to compensate for fluctuations in private construction. And in furtherance of this aim projects competing with or replacing private construction would be avoided as inimical to success. A shelf or reserve of fully planned projects, classified by deferrability, would be built up and the Executive would be given a large authorization for expenditure and adequate appropriations.

Both the total amount and the percentage of the cost of projects offered as grants to state-local governments might be varied yearly. Let us suppose Congress told the administrator of the agency, or the board of review, to use the level of private construction as the chief guide to policy decisions concerning grants. When the level was high, the percentage of the cost of approved state-local projects assumed as grants should be low; when the level was low, grants would be larger. The administrator, or board, either by authority or by Congressional instruction, might specify that for the year ahead, expected to be a year of high employment, the level of new private construction would be \$16 billion and the appropriate rate for federal grants be 10 percent. Unless this yearly rate of private construction fell off more than \$3 billion, 18 percent, the 10 percent would be held. If the yearly rate of private construction declined below \$13 billion, grants would be at the rate of 50 percent, and if below \$10.5 billion at the rate of 60 percent. The range in percentages, from 10 to 60, is wide because of

⁵¹ The history of the Bureau of Public Roads demonstrates how an efficient federal-state system of administrative relationships can be set up. This has, however, evolved during thirty-odd years from small beginnings. A favorable appraisal is given in *The Report of the Committee on Federal Grants-in-Aid of the Council of State Governments*, Federal Grants-in-Aid (1949), pp. 229-31, 238.

Level of Private Construction (billions of dollars)	Rate of Federal Grant (percent)
Above 13.0	10
10.5 and under 13.0	50
Under 10.5	60

the assumption that the federal government should be generous in depression and niggardly in prosperity.⁵²

The level of private construction might be allowed to fall 18-20 percent before specifying any increase in grant, and therefore in spending for public works, on the premise that such spending should not be responsive to mild downturns in private construction. In the first place, a mild downturn may reverse itself within a short period. Prompt acceleration of spending would in this case not serve a countercyclical purpose and might be inflationary. In the second place, construction costs are rigid against decline. Prompt acceleration of public construction, following a mild decline in private, would reduce the pressure toward a fall in costs.⁵³

It is, of course, possible that delay in accelerating public works might not avert bad timing, since an upturn in private construction might still coincide with the acceleration. But delay until the decline in private construction had been appreciable would reduce the possibility of this eventuality, and even if private construction did revive, the ground to be made up because of the delay might be sufficient so that the inflationary effect would be unimportant. The difficulty of bad timing could, moreover, be minimized by concentrating on *small* projects at the start. If private construction continued to drop, the public authorities could push large projects of long duration with more confidence. But if private construction recovered, construction of small public projects would soon cease.

Once a decision to accelerate public works has been taken, it should promptly be made effective. This is the purpose of advance planning. The same purpose is served by delaying acceleration until after an appreciable fall in private construction. A lag in initiation should give time to round

⁵² A small number of brackets might serve to reduce administrative complexity, and, since each class has a wide interval, state-local governments might be less tempted to delay or accelerate in the belief that a bracket might be broken through. Another administrative device might be to regard a break-through as established only if maintained.

⁵³ Gayer (*op. cit.*, p. 381), quoting S. H. Slichter, has suggested that a public works program be utilized by government to reduce construction costs: "The government might predicate its willingness to expand construction by a given amount upon the willingness of building labor and producers of building materials to accept a given reduction in the prices. In that event, the public works program would be doubly useful — it would directly tend to increase the volume of spending and it would accelerate price changes that are needed in order for a change and growth on a large scale to become profitable."

out plans for action — in brief, to conclude all preliminary moves short of letting contracts.

Let us return to the example given above and work out the possible effects upon the level of total construction. Assumptions must be made about the levels of federal and state-local construction at the start, and of their responsiveness to a policy of acceleration. Suppose the level of new public construction in a year of high employment to be \$4 billion, of which 30 percent is federal and 70 percent nonfederal. The prospect for increase with depression would, of course, be improved as far as public construction had been retarded in prosperity. Let us assume that when private construction fell below \$13 billion, public construction, both federal and non-federal, could be doubled in a year and a half, and that when private construction fell below \$10.5 billion, public construction could be increased threefold in two years.⁶⁴ The total spent as grants would grow from \$280 million to \$2,800 and \$5,040 million; the level of total construction would move from \$20,000 to \$20,900 and \$22,400 million (Table 37).

How could existing grant programs, notably that for highways with a federal share of 50 percent, be fitted into the scheme? If, at some future time, the program of aid for highways was being enlarged, an opportunity for merger into a variable grant plan would be presented. Otherwise integration that entailed loss of a 50 percent grant would encounter opposition. Indeed, officials connected with existing programs cannot be expected to favor a plan that would, in good years, reduce their grants to 10 percent.

A modification, altering the *status quo* less, would convert the plan into one for emergencies. In bad years grants on a liberal basis might be offered for construction not now receiving aid, and supplementary grants might be offered for existing programs. Logically this plan would, when economic conditions improved, call for discontinuing the former and reverting to

⁶⁴ These assumptions seem not to be extreme. Miles Colean assumed a threefold expansion of new public construction to be possible in one year (*op. cit.*, p. 38). During 1933-36 federal expenditure for construction, including work relief, grew relatively as follows (Galbraith and Johnson, *op. cit.*, p. 18):

	1933	1934	1935	1936
Current dollars	100	213	196	360
Constant dollars	100	195	188	336

Federal construction 1940-42 grew nearly eightfold, but much of it was for industrial plants which, except in wartime, are a private responsibility. State-local construction showed a high downward flexibility 1931-33, as already indicated. Since 1945 it has grown relatively as follows:

	1945	1946	1947	1948
Current dollars	100	208	367	538
Constant dollars	100	179	266	354

Table 37
 Hypothetical Variations in Level of Public Construction and Federal Grants from Prosperity to Depression
 Level of Construction (millions of dollars)

Year	P U B L I C						Federal Grants	
	PRIVATE	By Ownership		By Source of Funds		TOTAL	%	\$
		Total	Federal	Non-federal	Federal				Non-federal
0 (high employment)	16,000	4,000	1,200	2,800	1,480	2,520	10	280
1½ (depression)	12,900	8,000	2,400	5,600	5,200	2,800	50	2,800
2 (depression)	10,400	12,000	3,600	8,400	8,640	3,360	60	5,040

the latter. The defects of such an emergency scheme are that the complete obliteration of working administrative contacts in good years would place impediments in the way of quick action in emergencies, and that maximum countercyclical leverage requires complete rather than partial coverage of state and local construction.⁵⁵

D *Geographical Allocation of Grants*

Grants fluctuate cyclically, but at any point of time the federal percentage is uniform for all states. The justification is the developmental nature of construction expenditure: in contrast to welfare expenditure which affects directly only the level of consumption, its purpose is to improve productivity and employment. Construction expenditure, because a large part goes for the purchase of equipment and materials, may also be less localized in its effects than welfare expenditure. A good deal of public construction, furthermore, is for revenue-producing purposes — construction of facilities for water supply and sewage disposal, conservation and development, public service enterprises, and even highways and bridges. Considerations of this sort weigh against varying the federal share so as to favor the poorer states. In allocating total grants, however, account might be taken of differences in state needs. For example, a state with a large area and small population needs more rural highway mileage per capita and requires larger highway expenditures per capita than one in the opposite situation;⁵⁶ a state with a large urban population has more need for sewage disposal facilities than one with a large rural population. Precise measures of need are not necessary, and reliance on such criteria as total population, urban population, and area would serve for most purposes.

E *Location of Authority*

Where is authority to decide on the federal percentage and the total amount of the grant for each year to be vested? It is arguable that the predominant responsibility should be federal because the cyclical outlook of state-local governments is likely to be colored by the abundance or deficiency of their current resources and the pressures behind their projects. In Australia, another federal country, an intergovernmental mechanism, the National Works Council which advises the Loan Council, for making annual deci-

⁵⁵ A late start in providing grants would increase the danger of bad timing because once projects had become eligible for higher percentage grants, the higher percentage should usually hold until completion of the projects.

⁵⁶ Rates of Expenditure per	Nevada	Texas	New York	Rhode Island
Mile of rural road*	\$211	\$417	\$1,272	\$1,479
Square mile of area	45	310	2,149	3,716
Capita*	45	13	8	5

* Population 1940, rural road expenditures 1941.

sions concerning public works is in operation, although not enough time has elapsed to appraise its countercyclical effectiveness. And the Colmer Committee, the Committee on Intergovernmental Fiscal Relations, the Hoover Commission, etc., have made various suggestions, influenced by Australian examples, for establishing some regular intergovernmental body in the United States. For advisory purposes such a body might be useful. But operation of a countercyclical public works program may require a body, or a single administrator, with power to act. Under our system of government this is hard enough to achieve even at the federal level.

A scheme has been proposed that would call for the establishment in the executive branch of a board with power to review all projects, federal, state, and local. Concerned with review and not with the preparation of projects,⁵⁷ it would control their timing, approve state-local projects after Congress had authorized federal funds so that steps could safely be taken to place projects under construction, and decide (if a variable grant scheme were in operation) in accordance with a statutory provision what the federal percentage should be. Congress might have to vote a continuing appropriation and to forego, within broad limits, its yearly right to fix the amount to be spent. Under stress of depression in 1933 Congress through the National Industrial Recovery Act appropriated to the Executive the large sum of \$3,300 million, and placed broad discretionary power in the Executive concerning its allocation. As already said, the experience of FERA and WPA supplies some evidence that wide discretionary power in the hands of an administrator concerning the allocation of federal money among state-local governments may be unwise. Its justification then was a depression that had deepened and lengthened beyond all expectation. Action in advance of such an emergency should remove this justification and allow an administrator, or board, to be somewhat protected from pressures by working within the limits of objective criteria. The opposite danger of tying the hands of an administrator, or board, is equally to be avoided. An in-between scheme, involving some administrative discretion

⁵⁷ This would be left with the agency or bureau functionally best equipped to pass upon the intrinsic usefulness of projects. On these matters the Hoover Commission and its task forces spoke with a divided voice. The majority of the Commission, as part of its recommendation of an enlarged Department of the Interior, recommended the creation of a Board of Impartial Analysis for Engineering and Architectural Projects to "review projects not only from a technical point of view but also in their relation to the economy of the country" (*Reorganization of the Department of the Interior*, p. 4). It would not, apparently, be concerned with grant programs. Commissioners Acheson, Pollock, and Rowe wanted a Board of Review set up directly under the President to coordinate all projects of public works (*ibid.*, pp. 75-6). The *Task Force Report on Public Works* favored the organization of a Department of Public Works.

and some objective determination of federal action, might be worked out.⁵⁸ An arrangement embracing many governments is bound to be cumbersome, and when it deals with construction projects that take time to start and complete, obviously care must be taken to reduce inflexibilities.

F *Authority to Lend*

Another element that logically seems to belong in a coordinated public works scheme is federal power to lend to state and local governments. When state and local governments are unwilling or unable to provide their share of the expenditure,⁵⁹ the federal government might wish to make it easy and attractive for them to borrow in depression. The tax sources of most local governments and of some state governments are quite inelastic; their ability to borrow in the market may be limited by statutory restrictions and by the difficulty of getting reasonable terms. Net borrowing of state-local governments was a negative amount in 1933-38. Private lenders in depression are deterred by the risk of loss and lack of liquidity. The merits of lending to state and local governments for the sake of increasing employment are not their affair. Yet, as the experience of PWA shows, loans of this sort may be 'safe' if marketability after the depression is the test. Another reason a federal public works agency might want the power to lend is that loans are likely to be expansionary.⁶⁰ If state and local governments in depression secure their share of construction expenditure by increased taxation, especially by taxing consumption, the net effect of the grant scheme on the economy might be income decreasing.⁶¹ The spread

⁵⁸ For example, the law might stipulate that changes in the federal percentage as specified would become effective 30 days after announcement unless vetoed by concurrent resolution of the Congress.

⁵⁹ The U.S. Public Work Reserve found that most state and local governments had little idea how they might finance future public works. A reluctance to plan new bond issues was evident, as well as a tendency to expect federal assistance. Higgins, *International Labor Review*, November 1944, p. 597.

⁶⁰ Higgins has pointed out that "fiscal timing" of public works, shifting the proportion financed by current revenues, is more flexible than physical timing (*Public Investment and Full Employment*, p. 47). With the present high built-in flexibility of federal revenues the shift from an over-all surplus to a deficit and vice versa will be almost automatic; therefore no special steps seem necessary to make "fiscal timing" effective for federal public works. But for state and local governments, built-in flexibility is much less (short of a very serious depression that brought a vast growth of tax delinquency); moreover, they appear to be more likely than the federal government to enact new levies in depression.

⁶¹ Loans are likely to be expansionary because in depression purchases of government securities are likely to be made from savings or through monetary expansion. On the other hand, an expansion of construction expenditure financed by taxes on consumption may, by restricting consumption, neutralize or more than neutralize the stimulative effect of the increased government spending.

of commodity taxes in the 1930's indicates that some of the expansionary effect of increased spending was thereby drained away. In short, a scheme is indicated by which, in depression, grants are supplemented by loans from the federal government. In prosperity, on the other hand, no new loans would be extended, and the lending agency might sell its assets to private investors.

An observer who is impressed with the numerous and diverse needs for an enlarged current program of public works may worry that a countercyclical program might be too successful. If somehow the nation should achieve high employment for many years, a plan requiring that public works be held back until depression might reduce total public works below a desirable level. Public officials, waiting for a drop in private construction that did not come, would authorize construction of too few highways, streets, dams, etc. At present most public officials responsible for construction are acutely conscious of unfilled needs. For example, engineers and administrators regard the rate of construction and maintenance of highways as 40-50 percent below the level of adequacy. Apart from the wartime postponements and the postwar rise in prices, the reason is that, until recently, research in the functional, as distinct from the structural, design of highways has lagged. Today, however, highway engineers believe that they know how to design highways — width, grade, alignment, traffic interchanges, and dividing strips — to meet given conditions of traffic demand. Standards of road and structural design have been widely accepted for different conditions of traffic demand, and estimates of a desirable 10-20 year program based on their application indicate that the highway plant is grossly inadequate.⁶² To bring present plant up to standards now judged adequate for the traffic of today would, according to some estimates, require a capital expenditure of perhaps \$30 to \$40 billion, and if traffic needs for the next 15 years are reckoned, more than \$55 billion at 1948 prices. Similar, although less well documented, estimates could be presented for other areas of public construction.

Part of the answer to these fears is that no basis exists in history or analysis for assuming that depressions will not recur.⁶³ The key variable to which public construction in a countercyclical program is to be inversely geared is private construction, and its variability appears to be rooted in our economic system.

⁶² See *Highway Needs of the National Defense, Public Roads Administration, Aug. 1949* (mimeographed); G. P. St. Clair, *Nation-wide Requirements of the Highway Program* (Speech delivered at the National Tax Conference, Denver, Oct. 4, 1948).

⁶³ "For the present, obituaries on the business cycle are romantic expressions of human impatience, not records of solid achievement." Arthur F. Burns, *New Facts on Business Cycles, 30th Annual Report, NBER, 1950*, p. 3.

Another part of the answer is that a countercyclical program does not assume an unchanging average level of need for public construction. Our civilization has developed new areas of public construction and enlarged old areas. Governmental action and standards can be expected to conform to the needs of a changing society. And if depressions continue to occur, the countercyclical program may be used to reach more rapidly the level of adequacy for public construction the engineers desire. During prosperity public construction has lagged somewhat behind private; when severe depression came, public construction was postponed because of the fiscal weakness of state and local governments. If the countercyclical basis for public works could be made effective, and if Congress was convinced that the engineers had a case, in depression a program for achieving adequacy in public construction could be accelerated. Deceleration of public construction during the boom would be an extra justification for a more rapid rate in depression.

Other critics of the countercyclical plan make a very different complaint, arguing that if public construction can be timed so as to expand promptly in depression, slackening in the recovery will not be equally effective. Some projects, once started, have to be carried through to completion even in the face of active private construction. What are usually termed 'political' pressures also may operate against a reduction of spending. Some defense against these pressures may be offered by a scheme tied rigidly to objective criteria. But the main line of defense would probably be an administrative set-up that made countercyclical spending the touchstone of policy.

The unlikelihood of postponement of public works in prosperity, together with a scepticism concerning Congressional willingness to enact and retain a logical scheme, will lead some persons to the conclusion that nothing should be attempted. The basic difficulty with this attitude is that, in the event of depression, public works are almost certain to be expanded and have all the defects inherent in hasty improvisation. Undoubtedly the best time to undertake most public works is during recession and the worst time during a boom. A public program to make this effective would seem worthy of attention.