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**No. 17**

**PLANNING AND CONTROL OF  
PUBLIC WORKS**

# PLANNING AND CONTROL OF PUBLIC WORKS

REPORT OF THE COMMITTEE ON RECENT ECONOMIC CHANGES  
OF THE  
PRESIDENT'S CONFERENCE ON UNEMPLOYMENT

INCLUDING THE REPORT OF  
LEO WOLMAN  
OF THE  
NATIONAL BUREAU OF ECONOMIC RESEARCH, Inc.

NEW YORK  
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1931

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# PLANNING AND CONTROL OF PUBLIC WORKS

## A REPORT OF THE COMMITTEE ON RECENT ECONOMIC CHANGES OF THE PRESIDENT'S CONFERENCE ON UNEMPLOYMENT

### FOREWORD

In May 1929, the Committee on Recent Economic Changes of the President's Conference on Unemployment published its report on post-war developments in American economic life, particularly those since the recovery from the depression of 1920-21. At the suggestion of President Hoover, and with the assistance of the National Bureau of Economic Research and the Department of Commerce, the committee undertook, in July 1929, an examination of the planning and control of public works and their relation to employment. The report now made public is, like its predecessor, the result of the collaboration of a large number of agencies, governmental and private.

In connection with its various activities, the committee desires particularly to thank the Carnegie Corporation of New York and the Rockefeller Foundation for the funds which have made possible its investigations. It wishes to acknowledge also the services of Dr. Leo Wolman, Dr. Edwin F. Gay, and Dr. Wesley C. Mitchell, of the National Bureau of Economic Research (Inc.), for the basic survey and the fact finding report; the United States Departments of Commerce, of Agriculture, of Labor, of the Treasury and of the Post Office for data on public construction of various kinds; and the states and municipalities for coöperation in providing information.

The services of Hon. Robert P. Lamont, Secretary of Commerce, and those of the Division of Building and Housing and of the new Division of Public Construction set up in the Department of Commerce have been especially noteworthy. Dr. John M. Gries, and Messrs. James S. Taylor and John R. Rigglesman have made very valuable contributions. The committee is also indebted to Dr. Alan-

son D. Morehouse, I. Mansfield Spasoff, Robinson Newcomb, Thomas M. Curran, J. C. Leukhardt, R. M. Gates, A. B. Fridinger, and Frank Johnson, of the Department of Commerce; Thomas C. Coleman, Office of the Supervising Architect, Treasury Department; Colonel Thomas M. Robins, Corps of Engineers; T. Warren Allen, Bureau of Public Roads; Colonel Lewis H. Tripp, United States Veterans Bureau; Captain Y. S. Williams, Aide to the Secretary of the Navy; General L. H. Bash, chief, Construction Division, Quartermaster Corps, United States Army; Colonel U. S. Grant, 3d, Director of Public Buildings and Public Parks, Washington, D. C.

Generous coöperation and advice have been received from the agents of the Federal Government and from local public officials throughout the country. Without the assistance of the F. W. Dodge Corporation, the Engineering News-Record, the United States Bureau of the Census, and many departments of the governments of New York State and New York City, basic materials and estimates would not have been available. To these many individuals and to T. S. Holden, Vice President of the Statistical Division of the F. W. Dodge Corporation; C. B. Loudon, of the Statistical Division of the F. W. Dodge Corporation; Thomas P. Smith, Examiner of the Board of Estimate and Apportionment, New York City; A. M. Welch, Manager of Business News Department, Engineering News-Record; Robert R. Updegraff, Scarsdale, N. Y.; Prof. Baker Brownell, of Northwestern University; J. Scott Nicholls, Supervisor of Accounts and Auditor of Revenue, Department of Audit and Control, New York State; H. O. Schermerhorn, engineer of bridges and grade crossings, Department of Public Works, New York State; G. C. Ahles, senior assistant engineer, Division of Highways, Department of Public Works, New York State; H. S. Fairbank, chief engineer, Department of Agriculture, Bureau of Public Roads; R. Ridgway, chief engineer, Board of Transportation, New York City; Thaddeus Merriman, chief engineer, Board of Water Supply, New York City, the committee expresses its appreciation.

Dr. Leo Wolman and the National Bureau of Economic Research (Inc.) are solely responsible for the fact-finding survey herewith published; the Committee is solely responsible for the conclusions drawn from these facts and from other information put before it, which conclusions it presents in the following brief report.

## REPORT OF THE COMMITTEE

### SECTION I

**The Principle and Technique of Economic Balance.**—In the report of the committee on Recent Economic Changes, completed on February 28, 1929, attention was directed to the principle and technique of economic balance. It was recognized that private initiative, under conditions of relatively free competition, tends to establish an equilibrium among economic forces. But in practice this tendency, unrestrained, tends to produce alternate periods of depression and marked prosperity, and within each period to show a "spotty" condition as capital, enterprise, and labor unevenly concentrate.

The committee pointed out that the forces which bear upon our economic relationships have always been sensitive. From the prime processes of making and marketing to the facilitating functions of finance, all parts of our economic structure are interdependent and easily affected. And therein lies the danger; that through failure to recognize the inexorable operation of economic principles, or through private greed or lack of public understanding of the far-reaching influence of unsocial individual actions, this balance will be disturbed, greatly to our economic detriment.

It becomes increasingly clear that steady employment, the factor upon which our economic welfare is so largely dependent, is in turn dependent upon a growing and widely diffused skill in coördinating and steadying all the manifold and sensitive business processes which pivot about the consuming home, processes which serve its necessities and minister to the broadening life of the individual and the family.

A perfectly even flow of economic activities is not practically attainable, but an increasing degree of economic stability is undoubtedly the goal toward which the world is now working.

The survey of our own country's economic developments since 1922, already published by the committee, clearly demonstrated



the value of maintaining, year in and year out, a reasonable economic balance which enables the intricate machinery of our industrial and commercial life to function smoothly.

Recent experiences have reinforced the committee's conviction of the necessity of studying more intensively the factors which make for the maintenance of economic balance.

**A Continuing Study of Economic Factors.**—The committee regards the comprehensive survey which accompanied its first report primarily as a point of departure. It is an initial step in a continuing study.

The changes affecting economic welfare were there described and, when possible, statistically measured. Now the most active and influential factors in that progress should be segregated and subjected to analysis, with the hope of contributing to a practical, workable technique designed to promote a reasonable balance of economic forces. With this in view, the committee is carrying on investigations along several broad lines and plans to present its findings from time to time as progress warrants.

Two inquiries, somewhat more detailed, were taken in hand by the committee shortly after the conclusion of the work upon its first report on recent economic changes in the United States. One of these was an exploration into the broad field of price relationships. The other was a preliminary examination of public construction as an element in any program of economic stability. In view of recent events, this examination has been rapidly pushed forward. The fact-finding survey of this subject, prepared by the National Bureau of Economic Research, with the cooperation of the United States Department of Commerce, accompanies this report.

## SECTION II

**The Stabilizing Influence of Public Construction.**—If the sources for current information as to expenditures for public works and for budgeted future projects could be materially improved, and if Federal, State, and municipal authorities were prepared to act in concert, as the factors which affect the course of economic events indicate an approaching depression, the accumulation, on a national scale, of even relatively small and scattered margins of public construction which might wisely and with promptness be expedited, added to the amount of public construction hitherto available for

acceleration would make up a sum ordinarily sufficient to be an appreciable factor in restoring reasonable economic balance.

But obviously, it is only one factor. The business community can not expect to operate without restraints of its own or to counterbalance careless excesses by undue reliance solely on public construction. In its proper place, however, as one among a number of steadying influences, and at its proper time, the acceleration of public construction may well become useful. This is the conclusion which emerges from consideration by the committee of the information put before it.

**National Influence of Public Works.**—On public construction about \$3,500,000,000 is expended each year and about 900,000 men are directly employed, according to the survey by the National Bureau of Economic Research and the Department of Commerce. The general trend is still rising.

These public expenditures on permanent improvements in the United States represent from 35 to 40 per cent of the total volume of expenditures for all private and public construction. Because of the difficulty of making satisfactory estimates of the total expenditures for repairs and maintenance, which are increasing from year to year, and of the total outlay of towns and townships, it is probable that these figures understate the total outlay on public works in this country.

Along with the increase in the American standard of living characteristic of this period, has been a continued increase in public works. The future programs of American governments reflect the pressing physical requirements of our communities, their rising standards and the increased coördination of all their parts. Participation by the people as a whole in many of the benefits of increased productivity, which of itself has varied as between different groups and geographical areas, has been one of the marked characteristics of American economic life.

While industrial, agricultural, and commercial activity has been "spotty," the broad social advantages of our accelerated activity have flowed out over the land. The highway building programs throughout the Nation have not been limited to the intensely active areas; good roads have been extended in all directions, serving the whole population. The same might be said for educational advantages, hospital and health facilities, personal mobility made possible by low-priced motor cars, swift and dependable transporta-

tion and communication, and numerous other facilities and services making for comfort and well-being, beyond the elemental requirements of food, clothing and shelter. Among these consequences of higher living standards increased public construction has an important place.

Public roads in 1929, the largest single element in public construction, cost more than \$1,500,000,000. On roads more than one-third of the public works outlay of the Federal Government was expended, and on roads and shipbuilding more than one-half was spent. The leading expenditures of the state governments were on road-building, grade crossings and on public buildings. American municipalities spent their moneys largely for permanent improvements, notably on transportation facilities in the form of subways, bridges, viaducts, street extensions and widenings, on public buildings, on general schools and hospitals, and on systems of water supply and sewage disposal. These works are scattered through every State in the Union and the activity stimulated by them is widely distributed.

Today the principal spending agencies are behind in their programs for permanent improvements. It is impossible to make a statistical estimate of the public expenditure on public works in the next few years, but it would appear that communities whose growth continues must make programs of construction requiring substantial outlays for traffic relief, water supply, sewage disposal, and hospital and educational facilities. Though per capita debt burdens have increased in recent years sampling studies of the margins of unused borrowing power indicate no financial embarrassment on the part of most of our governmental units.

There are great public works to be built, there is money to do it, and in this country where future projects of permanent public improvements are so fixed and well defined, it is unnecessary to resort to makeshifts for additional work. Never have programs of poor relief or charity colored, to any appreciable extent, the American policy toward public works in relation to unemployment and advocates of long range planning favor active prosecution of projects which are economically desirable at the most desirable time. From the standpoint of the tax payers who provide the funds and from that of labor which may be employed upon the work, non-economic reasons for public construction have not been favored.

**Public Construction Normally Slow in Reaction.**—That declines in public works started during periods of depression have continued even after general business has revived, is indicated by studies of the National Bureau of Economic Research. In recent months, however, this tendency has been measurably counteracted and public construction has been increased. Contracts awarded for public works and public utilities in the first four months of 1930 showed an increase of 30 per cent over the corresponding period of 1929. This is striking evidence of acceleration.

Left to themselves contracts for public construction are not highly sensitive to the cyclical movements in business. Having started to decline during periods of depression, public works have continued to decline sometimes all the way through the revival of the next cycle. To offset this natural tendency, to turn the course of public construction from a depressing to a stimulating influence, is of the very essence of the usefulness of public works as a balancing economic factor. And it is in promptly and comprehensively expediting work on projects already planned, rather than in initiating new undertakings, that the key to the problem lies.

**The "Timing" Factor.**—The amount of public construction which it is possible to push forward in order to influence employment and the trend of business in a period of recession is less important than the timing of the acceleration. The psychological effect of advancing public construction at the right time suggests that here is to be found an important factor in the problem of maintaining a reasonable economic balance. If properly timed, as the pendulum of employment starts to swing in an unfavorable direction, the influence of the prompt expedition of public works is effective out of all proportion to its size. Timeliness multiplies the effectiveness of each project accelerated.

Prompt action, before conditions become serious, can be assured only as there is developed a practical method of gauging the economic situation, so that unfavorable trends which threaten adversely to influence the economic balance may be anticipated and compensating factors influenced earlier than would be the case if natural forces were left to act in their own time and way. Skilled use of the time factor must, therefore, enter into a program of planning for stabilization.

An unplanned form of emergency relief for unemployment, public construction has long been tried and found in great measure

wanting. Nor does it appear practicable or necessary on any *large scale* to withhold expenditure on public construction during years of prosperity in order to accumulate a reserve of work during business depressions. The skillful timing in the use of a comparatively small margin of public construction is far more important. In this lies the real advantageous opportunity for practical influence upon the economic balance.

Slow acting, and properly so, are the restraints on public bodies made to safeguard bond issues and appropriations and the expenditures of public money. To conform to this legitimate rigidity, and at the same time to help to preserve the economic balance in times of threatened depression, it is necessary to have both mobility and protection. The timing of public works must be adjusted to these two principles.

Experience in recent months seems to show that even in the face of present legal requirements much can be done where a determined effort is made. But more might be done in the future if the problem were more completely explored with the double purpose of advancing both the financial mobility of states and municipalities and the safeguards and security of the tax-paying citizens.

The committee suggests that the American Bar Association appoint a committee to examine the legal questions involved in present procedure and to make recommendations for dealing with this dual problem.

**Planning and Acceleration.**—Long-range planning and budgeting are necessary if the full value of public works as a stabilizing influence is to be developed. At present there are many obstacles in the way of pushing public projects with such speed as is possible on private work, especially during the steps preliminary to contract-letting. Fortunately, the recent trend toward city and regional planning makes the task an easier one than it would have been even a few years ago. City planning commissions, bureaus of municipal research, and special committees appointed by the heads of local governments, city, county, and state, have contributed to this development. Comprehensive physical planning of public works within each city and region is a clear and evident need. This enables sites to be acquired in advance and plans to be made well ahead of the actual start of the work, so that when an emergency comes discretionary projects can go ahead with assurance that they

are properly located and well adapted for the purpose for which they are intended, and without the delays that might ensue if the relative merits of different locations and alternative plans for structures had to be debated, or else decided arbitrarily on the basis of hasty consideration.

Long-range budgeting of capital expenditures, in which the programs of the several local government departments are harmonized, is another feature of planning which has not yet been adapted as widely as it should be, though the committee finds that a number of city planning commissions, bureaus of municipal research, and special committees appointed by heads of local governments, county, and state, have participated in preparing such programs.

Even without conscious planning some degree of balancing adjustment already exists, since certain types of construction activities tend to decline with the tightening money market. An increase in the cost of securing capital, in competition with other demands for capital, tends automatically to be a check on public construction. And, conversely, in an easier money market after a recession has set in, some kinds of private and of public construction tend to increase before the rise of general business activity. But this compensatory tendency cannot, as a rule, act with sufficient promptness. Deliberate acceleration of public works remains desirable at times.

Successful preparation for this in the future will require careful investigation of all the factors involved in connection with the various departments of state, county, and municipal governments throughout the country. This will require the working together of local officials and of interested citizens, either as individuals or through their local civic or commercial organizations. In many cases, the experience gained in attempting to expedite public construction work during recent months will serve as a guide in removing obstacles that might impede similar attempts in the future.

It remains, now, to improve the central sources of current information regarding public construction in order to provide the necessary data on which timely action can be based in threatened emergencies. It may be possible to measure month by month the number of workers employed directly in the public service or indirectly on contract, extending to the Government itself the plan already developed for uniform monthly reports from private indus-

try to Federal and State bureaus of labor statistics. There should be regular reports on the expenditures for public construction projects for the principal spending agencies. The Division of Public Construction, recently set up by the Federal Government in the Department of Commerce, is a promising agency for the purpose.

With a nation-wide improvement, properly safeguarded and flexible, in the financial and administrative organization of governmental agencies, and with information as to their current operations centrally located, a long step will have been taken toward the use of public construction as a steadying influence. The moderate elasticity in spending power which any reasonable budgeting system must provide will yield, by accumulating on a national scale the relatively small margins of each unit, a sum ordinarily sufficient to be an effective factor in the maintenance of economic balance.

### SECTION III

**A Program of Exploration and Appraisal.**—As has been indicated, the committee regards the preliminary survey of public construction which accompanies this report as but one of the steps in bringing together the material from which it is hoped there may be set-up a “technique of balance,” the need for which was developed in its original report.

The planning and control of public construction seems to be an important step, not as a large scale measure of emergency relief, but, in the group of active balancing factors, that one which is closely related to the movement of interest rates and to the volume of employment.

It is with this group of active or positive factors that the committee is most concerned. It believes that one by one, successively, they may be explored and appraised until their nature and their influence on the course of economic events are better understood. The relations of these influencing factors to each other and to the whole economic system are highly complex and the analysis and presentation of them cannot, without danger, be over-simplified. But it is the hope of the committee that, step by step, it may bring together and clarify our knowledge of the more significant processes now operating in our economic life.

As the above statement and, indeed, as its whole program of exploration presupposes, the committee believes that unbalanced

economic relationships are susceptible to modifying influence if their nature is more clearly understood and some basis of measurement, or continuous gauging of those factors which are premonitory, is devised so that future trends may be more accurately anticipated.

In its frequent use of the terms "stabilization" and "technique of economic balance," the committee desires to guard the readers of this report against a possible misconception. A perfectly adjusted balance is not only considered practically unrealizable; it might even, if attained, tend to impede progress.

It was early recognized that the most the committee can hope to accomplish, is to enlarge the foundation for an appraisal mechanism which may assist the public in gauging the importance of the various forces in operation, so that it may take steps to set in motion, during times of threatened economic stress, forces which may tend to modify excesses. It was further recognized that even so broad a program as this must accommodate itself to the actualities of life.

**A "Zone of Tolerance."**—One of these actualities is the necessity of recognizing what may be termed a "zone of tolerance" within which the action and reaction of the most active economic forces has to be considered normal, and even healthy.

Only when some factor, or combination of factors, threatens to carry the situation beyond the boundaries of this theoretical "zone of tolerance," and it becomes apparent that we shall presently be seriously out of balance economically, if no counter influences are set up, should steps be taken to modify the influences of an overweighted or one-sided development.

**Further Inquiries.**—The committee is planning a further exploration into the effects of varying interest rates or capital costs upon the chief types of construction. It is also undertaking an examination of that fundamental incentive, the "lure of profits," as manifested during the last 10 years in American economic life.

A more immediate step, however, is a study of price relationships, of the changing levels in the basis of exchange of the work of one man or group of men for the work of another man or group. This survey, comparing statistically these shifting levels over successive periods, is bound up with the everyday concerns of our people and their welfare. It is expected that the results of this survey will appear before the end of this year. Like the present report, it will take its place in the step-by-step analysis which the



committee is making, in the hope that with better and more general understanding of economic forces, and the laws of their operation, American business may develop increasing self-control.

The ultimate aim of the committee's program of exploration and appraisal, to the end that employment may be more stable and adequate income more assured, is the intelligent and reasonable stabilization of business, mainly by the business community itself, aided by public administrators and an informed and responsive public opinion.

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**PLANNING AND CONTROL OF  
PUBLIC WORKS**

*by*

**LEO WOLMAN**

*of the*

**NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.**

# National Bureau of Economic Research, Inc.

Incorporated under the Membership Corporation Laws of the State of New York, January 29, 1920

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Adopted Oct. 25, 1926.

# PLANNING AND CONTROL OF PUBLIC WORKS

## INTRODUCTION\*

This survey of the expenditures of American governments on public works was begun in the summer of 1929, some months before the crash in the American stock market and the spread of unemployment among American industries. Although the use of public works as a factor in the regularization of industry or in stimulating business has been the subject of considerable discussion in this, as in foreign countries, the factual basis for a considered policy and program was lacking. It was proposed, therefore, to undertake a preliminary, but comprehensive study of the volume of public expenditures on permanent improvements; their variety; the programs of the future; the important administrative features encountered in the execution of public works projects; and to examine, in theory and practice, the essential elements of proposed programs of control.

In the preparation of estimates of the total volume of public works in this country, it is necessary to resort to two separate and distinct sources of information, the statistics of contracts awarded for public works and the official reports of the expenditures of the various governments on permanent improvements. Of these two sources, the first alone is convenient and exhaustive. Use of the second involves not only the examination of hundreds of the financial reports of municipalities, towns and townships, federal and state governments, but, in addition, discussion with the financial officers of these governments for the purpose of reclassifying the published records of outlays and placing them upon a more or less comparable basis. Estimates of total expenditures in this study, therefore, rest upon the statistics of contracts awarded and not upon the financial reports of public agencies.

Since it is in part the purpose of this survey to present an adequate view of the characteristics of the public works problem in this country, these gross estimates of expenditures are supplemented by more or less detailed descriptions of the activities of sample municipal and state governments, of the federal government, and of the Bureau of Public Highways. The expenditures

\*The author wishes to express his deep appreciation to Arthur D. Gayer, Frances Rice, David Weintraub and Celeste Nason who assisted in the collection of the basic data.

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of the governments of New York City and of New York State were chosen as descriptive of the public works activities of state and municipal governments, not because they are the most representative or the most typical, but because the data were close at hand and most conveniently available for collection and analysis.

The status of public works projects, in most of their phases, is always changing. Permanent improvements are planned, initiated and completed. The power of governments to tax and to borrow varies with the changes in general economic conditions and with the state of affairs prevailing in particular communities. Computations of the unused margins of borrowing-power that represent an accurate picture at one date may be without much value six months later. The presentation of these changing items requires the existence of a continuing agency, charged with the function of collecting basic data, reducing them to comparable form, and keeping them up to date. This function the Division of Public Construction of the United States Department of Commerce, created on December 2, 1929, has already begun to perform. After several years, the Division of Public Construction may be expected to issue current reports on the important aspects of public construction whose immediate preparation, in the present state of the materials, would involve great expense.

Probably the most important finding of the present study is the estimate of the volume of expenditures in the United States on projects of public construction. During the most recent years, public works constituted between 35 and 40 per cent of all construction, both public and private, in this country and in 1928 and 1929 amounted to roughly \$3,500,000,000 a year, having risen to this level from somewhat less than two billions in 1923. The largest single category of public construction is road building which in 1928 accounted for an expenditure of more than one and one half billion dollars. It is probable that these figures underestimate the total outlay on public works in this country, because of the difficulty of making satisfactory estimates of the total expenditures on repairs and maintenance, which appear to be increasing from year to year, and of the total outlays of towns and townships.

Outlays by the federal government on public works are less than ten per cent of the total. The federal government and all governments within the geographical area of New York State, together, account in recent years for 20 per cent of the total ex-

penditures on public construction in this country. This proportion will probably be exceeded during 1930 because of the increased budgets of the federal government, and of the governments of New York City and New York State. Of the outlays of the federal government on public works more than a third is spent on public roads and more than one-half on roads and ship building. The leading expenditures of state governments are on road building, the elimination of grade crossings, and on public buildings. American municipalities spend their appropriations for permanent improvements largely for improving the facilities of transportation, in the form of expenditures for subways, bridges, viaducts, street extensions and widening; on public buildings, largely schools and hospitals; and on improving the facilities of water supply and sewage disposal.

While it is impossible to make a statistical estimate of the probable expenditures on public works in the next years, it is clear that the principal spending agencies are behind in their programs of permanent improvements. The future programs of American governments reflect the pressing physical requirements of our communities and their rising standards of living. Except in the case of communities whose growth has stopped or whose rate of growth has been retarded, the problems of traffic congestion, or water supply and sewage disposal, and of adequate hospital and school facilities appear to impose on American governments programs requiring mounting outlays for those purposes in the future.

Constitutional limitations on the public debt and the burden of a rising tax rate are the most serious limiting factors on the uninterrupted rise in appropriations for public works. All local governments are limited by constitutional provision in their power to incur debt. In general, debt-incurring power is fixed by the relation between the outstanding debt and the assessed valuation of property. Since 1919, it would appear that the tax rate and the per capita debt burden has increased more rapidly than the assessed valuation of property. Sample studies of the margins of unused debt power, however, indicate that the bulk of American governments were not in 1928 and 1929, at least, in a state of financial embarrassment, because of the operations of these constitutional limitations. A not inconsiderable factor in the situation has been the creation of quasi-public authorities, such as the Port of New York Authority, empowered to borrow without involving the

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credit of the government and to initiate and operate public works.

Changes in the volume of the public debt are also affected by the state of the money market. The disorganized state of the money market during the war, for instance, produced a marked drop in the flotation of public bond issues. During a period of extreme stringency, like that prevailing in 1928 and 1929, governments reduced their issues and for pressing needs resorted to the use of short term issues and to temporary drafts on their current revenue. Thus the total of municipal loans for new financing dropped from \$1,150,000,000 in the first nine months of 1927, to \$962,000,000 in 1928, and to \$918,000,000 in 1929. With the easing of money rates at the close of 1929, there was a sharp rise of municipal issues in December 1929, bringing the total for that month above the total for any December since 1920, excepting 1921.

The very large number of agencies concerned with the planning, initiation and execution of public works in this country present obvious problems in the control of these operations. The impression of confusion that arises out of the detailed consideration of the expenditures of the many governments of the country is clearly exaggerated, since the total construction output of American governments is \$3,500,000,000 or the equivalent of the value product of any vast competitive industry. The fact of the multiplicity of public planning and administrative agencies, nevertheless, remains. But the influence of this factor can be measurably reduced in proportion as our public economies are placed on sounder foundations. Where, in other words, the dictates of efficient government have led to the use of adequate budgets, and the planning of expenditures over a series of years, it would appear to be possible to use the machinery so set up for the purposes of accelerating public works when such a program is deemed necessary. The existence of future five or ten-year programs of public projects, as in the cases of Cincinnati and Detroit, or in the building of subways and water supply systems in New York City, has created the requisite machinery of control. In general, the activities of city and regional planning commissions, of bureaus of municipal research, and of voluntary conference committees such as exist in Rochester and Philadelphia, or an agency like that recently created by the Governor of New York



State, have hastened the prospects for future planning and control.

A factor in the planning and control of public works is their high degree of seasonal variation, which, if it were found to be unavoidable, might prevent a substantial increase in the volume of such undertakings during the winter months. A study of the seasonal variations in various types of construction contracts from 1919 to 1928 disclose the widest variations among contracts for public works and public utilities. Results arrived at by comparing the average deviation of the seasonal index from 100 and the range from the lowest to the highest months, for the various groups of construction contracts are shown in the following tabulation: <sup>1</sup>

Series	Average Deviation	Range
Total Contracts, All groups.....	15.2	58
Residential .....	11.8	49
Commercial .....	12.5	40
Industrial .....	13.8	60
Public Works and Public Utilities.....	25.6	84

The greater seasonal variability in the last series may well be due, in part at least, to the large proportion of public expenditures that is used in the construction of highways, where improved practices and better planning may in the future reduce these ranges as they have been reduced in many other types of construction.

On the question of the uses of proposed controls over public construction, the prevailing theories show the uncertainties characteristic of many of our explanations of basic economic problems. The increase in the volume of public works as a direct solution of the unemployment problem has historically proved a failure. This method has failed to absorb a substantial proportion of the unemployed; it has led to the undertaking of works not really required by the government; and to great wastes in the administration of the job. The method of the "prosperity reserve" involving as it does the retardation of public works, has produced further difficulties. In many periods public construction is subject to natural retardations due to money stringency, a tight labor market,

<sup>1</sup> Taken from the unpublished data of Wesley C. Mitchell and Simon Kuznets, National Bureau of Economic Research.

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the rising cost of materials, or like factors. The bulk of American governments also would seem to be far behind in their programs for meeting the physical necessities of the situation. Retardation would, therefore, meet with resistance on the part of public officials. The most feasible form of control, consequently, appears to be that of the temporary acceleration of works already projected. The effective achievement of this goal depends, in turn, on the progressive improvement in the management of our many governments.

## CHAPTER I

### THE EXPENDITURES OF CITIES

Municipal expenditures for public works in this country have grown with great rapidity during the past ten years. This growth is in part due to the rapid rate of increase in the urban population of the United States, and in part to the rising standards of living of American cities.

The rate of increase of our urban population is a well-known feature of American population growth during these many decades, and seems to be continuing without interruption. Since 1910, as the following tabulation shows, the numbers living in cities with a population of 30,000 and over increased from less than 30 per cent to 36 per cent of the total population of the country,<sup>2</sup> in the face of a substantial rise in that total.

Year	Total Population United States (thousands)	No. of Cities of 30,000 and over	Population In Cities of 30,000 and over (thousands)	Per Cent of Total Population in Cities of 30,000 and over
1910	91,972	184	27,316	29.7
1920	106,422	247	36,654	34.4
1922	109,893	261	38,737	35.2
1924	113,727	248	39,981	35.2
1926	117,136	250	41,840	35.7
1927	118,628	250	42,716	36.0

The accelerated rate of growth of the American city, particularly of the large cities, has necessarily left municipal governments far behind in their programs to provide the equipment required by an increasing population. Congestion of population has caused municipal governments to fall far behind in their plans for the development of adequate transportation facilities. An increasing

<sup>2</sup> U. S. Bureau of the Census, *Financial Statistics of Cities*.

TABLE 1.— THE GROWTH AND DISTRIBUTION OF THE OUTSTANDING DEBT OF NEW YORK CITY,  
1830-1928

(In thousands)

PURPOSE	YEAR ENDING DECEMBER 31ST.							
	1830	1840	1860	1885	1897	1910	1926	1928
Rapid transit.....	....	....	....	....	....	\$64,652	\$301,609	\$446,110
Schools.....	....	....	....	\$ 1,168	\$18,045	110,367	263,074	301,374
Water supply.....	....	\$7,803	\$8,899	17,747	53,083	130,821	277,203	299,686
Streets and sewers, including assess- ment bonds.....	....	400	1,897	16,963	24,992	164,460	212,459	256,198
Public buildings, other than schools..	\$570	1,015	943	6,345	24,319	75,030	138,583	160,527
Docks.....	....	....	800	12,053	34,033	108,783	143,298	155,986
Bridges.....	....	....	....	5,587	13,474	93,782	101,165	67,482
Parks.....	....	....	6,656	13,250	28,845	62,606	56,957	62,958
Miscellaneous, including refunding..	....	1,623	3,303	52,015	25,168	36,622	56,847	74,031
Total.....	\$570	\$10,841	\$22,203	\$125,475	\$223,018	\$657,953	\$1,551,198	\$1,824,352

SOURCE: For years 1830-1926, from *The Finances and Financial Administration of New York City: Recommendations and Report of the Sub-Committee on Budget, Finance and Revenue of the City Committee on Plan and Survey*, New York, 1928, p. 192; for 1928, figures from *Comptroller's Statement of the Debt Incur-  
ring Power of the City as of January 1, 1929*, p. 14.



## 10 PLANNING AND CONTROL OF PUBLIC WORKS

rate of water consumption likewise has made necessary extensions and improvements in the existing plant and the utilization of more remote supplies of potable water, involving rising expenditures for construction. Pressure of population thus produces a wide range of needs, that have led inevitably to rapid growth in the size of the plant and equipment of the typical American city.

Most American cities are, further, centers of industry and commerce. The prevailing level of wealth and income is notably higher in our urban than in our rural areas, and has tended to become relatively more so. Municipal expenditure for public improvements, consequently, has come to reflect the mounting standards of living of the population in these communities for whom the improvements are made. Advanced standards of school buildings and hospitals; improved sanitary provisions; better lighting systems; the widening and resurfacing of city streets; extensions of park systems, are all items in the expenditures of cities that increase with the rise of incomes of the urban population. While the figures do not lend themselves to this kind of analysis, it is probable that the expenditures for public construction by cities with a population of 30,000 and over now amount to more than one-fourth of the total expenditures for public works in the country; and this proportion would be even greater if expenditures for highways, financed largely by state, county and federal governments, were taken out of the totals.

Unfortunately, no statistical series are available to describe the changes in the expenditures of American municipalities for public works during the past century. The growth of the outstanding indebtedness of New York City since 1830 and the classification of this indebtedness by purpose throws considerable light on the matter. The variations are, in a measure, representative of the changes for the whole country, except, of course, that the expenditures of New York City for rapid transit came, in the latest decades, to consume a larger share of the total than is the case in smaller cities.

"In the outstanding indebtedness of 1860 the water supply was the principal item, with parks coming second. By 1897 docks and public buildings, streets and sewers, parks, schools and bridges all required substantial expenditures, but water still held the leading place. By 1926, parks, which had been second in importance in 1860 and third in 1897, held the eighth position. Rapid transit

TABLE 2.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN 14  
SELECTED CITIES, COMBINED, 1919-1928\*

(In thousands)

Purpose	1919		1920		1921		1922		1923	
	Amount	% Dis-tribution	Amount	% Dis-tribution	Amount	% Dis-tribution	Amount	% Dis-tribution	Amount	% Dis-tribution
Educational buildings.....	\$25,017	23.5	\$30,482	16.6	\$45,018	21.4	\$56,983	32.2	\$73,179	47.5
Hospitals and institutions.....	8,741	8.2	11,839	6.5	20,004	14.0	27,730	15.7	17,326	11.3
Military and naval buildings.....	4,697	4.4	8,892	2.1	904	0.4	500	0.3	501	0.3
Public buildings.....	2,227	2.1	10,378	5.6	10,991	7.4	5,403	3.0	4,137	2.7
Waterfront developments.....	5,484	5.1	4,859	2.4	6,589	4.6	5,021	2.8	5,994	3.9
Bridges.....	6,742	6.3	6,248	3.5	6,577	4.6	5,210	2.9	5,875	3.6
Incinerators.....	102	0.1	232	0.1	5	"	103	0.1	1,709	1.1
Lighting systems.....	1,194	1.1	45,121	24.5	1,966	1.4	3,763	2.1	5,590	3.6
Docks and piers.....	6,758	6.3	32,720	12.4	2,279	1.6	3,626	2.0	823	0.5
Subways and tunnels.....	1,011	0.9	4,261	2.3	1,988	1.4	21,705	12.2	7,818	5.1
Sewage systems.....	19,784	18.5	11,828	6.4	16,324	11.4	13,482	7.6	4,824	2.9
Streets and roads.....	23,036	21.6	27,567	15.0	24,627	17.1	26,071	14.7	15,949	10.3
Water supply systems.....	1,769	1.7	4,359	2.4	6,414	4.5	6,702	3.8	10,700	6.9
Parks (public).....	247	0.2	439	0.2	241	0.2	981	0.6	421	0.3
<b>Total.....</b>	<b>\$106,728</b>	<b>100.0</b>	<b>\$183,824</b>	<b>100.0</b>	<b>\$143,227</b>	<b>100.0</b>	<b>\$177,280</b>	<b>100.0</b>	<b>\$154,246</b>	<b>100.0</b>

Purpose	1924		1925		1926		1927		1928	
	Amount	% Dis-tribution	Amount	% Dis-tribution	Amount	% Dis-tribution	Amount	% Dis-tribution	Amount	% Dis-tribution
Educational buildings.....	\$75,398	36.5	\$74,983	29.3	\$90,612 <sup>b</sup>	27.8 <sup>a</sup>	\$96,129 <sup>a</sup>	23.0 <sup>a</sup>	\$100,073 <sup>b</sup>	23.1 <sup>b</sup>
Hospitals and institutions.....	27,662	13.4	37,904	14.8	44,073	13.5	44,346	10.6	60,542	14.0
Military and naval buildings.....	218	0.1	1,977	0.8	1,136	0.3	867	0.2	3,115	0.7
Public buildings.....	10,570	5.1	9,871	3.8	15,301	4.7	20,997	5.1	13,984	3.0
Waterfront developments.....	4,741	2.3	2,363	0.9	6,370	2.0	6,462	1.5	7,116	1.6
Bridges.....	18,330	8.8	13,593	5.2	27,307	8.4	45,189	10.8	23,802	5.5
Incinerators.....	1,385	0.7	704	0.3	565	0.2	1,998	0.5	1,527	0.6
Lighting systems.....	3,433	1.7	8,431	3.3	12,407	4.1	6,515	1.6	6,820	1.6
Docks and piers.....	472	0.2	2,037	0.6	"	"	"	"	"	"
Subways and tunnels.....	23,230	13.6	62,367	24.2	65,000 <sup>c</sup>	30.0 <sup>c</sup>	75,000 <sup>c</sup>	18.0 <sup>c</sup>	80,000 <sup>c</sup>	18.5 <sup>c</sup>
Sewage systems.....	7,891	3.7	11,268	4.4	17,611	5.4	40,790	9.8	28,239	6.5
Streets and roads.....	25,592	12.4	25,462	9.9	27,155	11.4	68,261	16.4	56,632	13.6
Water supply systems.....	2,876	1.4	5,376	2.1	6,851	2.1	9,799	2.3	48,622	11.2
Parks (public).....	219	0.1	126	"	853 <sup>d</sup>	0.1 <sup>d</sup>	982 <sup>d</sup>	0.2 <sup>d</sup>	561 <sup>d</sup>	0.1 <sup>d</sup>
<b>Total.....</b>	<b>\$206,606</b>	<b>100.0</b>	<b>\$256,262</b>	<b>100.0</b>	<b>\$325,741</b>	<b>100.0</b>	<b>\$417,336</b>	<b>100.0</b>	<b>\$432,014</b>	<b>100.0</b>

Sources: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> The fourteen cities included are Albany, Boston, Buffalo, Chicago, Cleveland, Detroit, Indianapolis, Newark, New Haven, New York, Philadelphia, Rochester, St. Louis and St. Paul.

<sup>b</sup> Includes private schools.

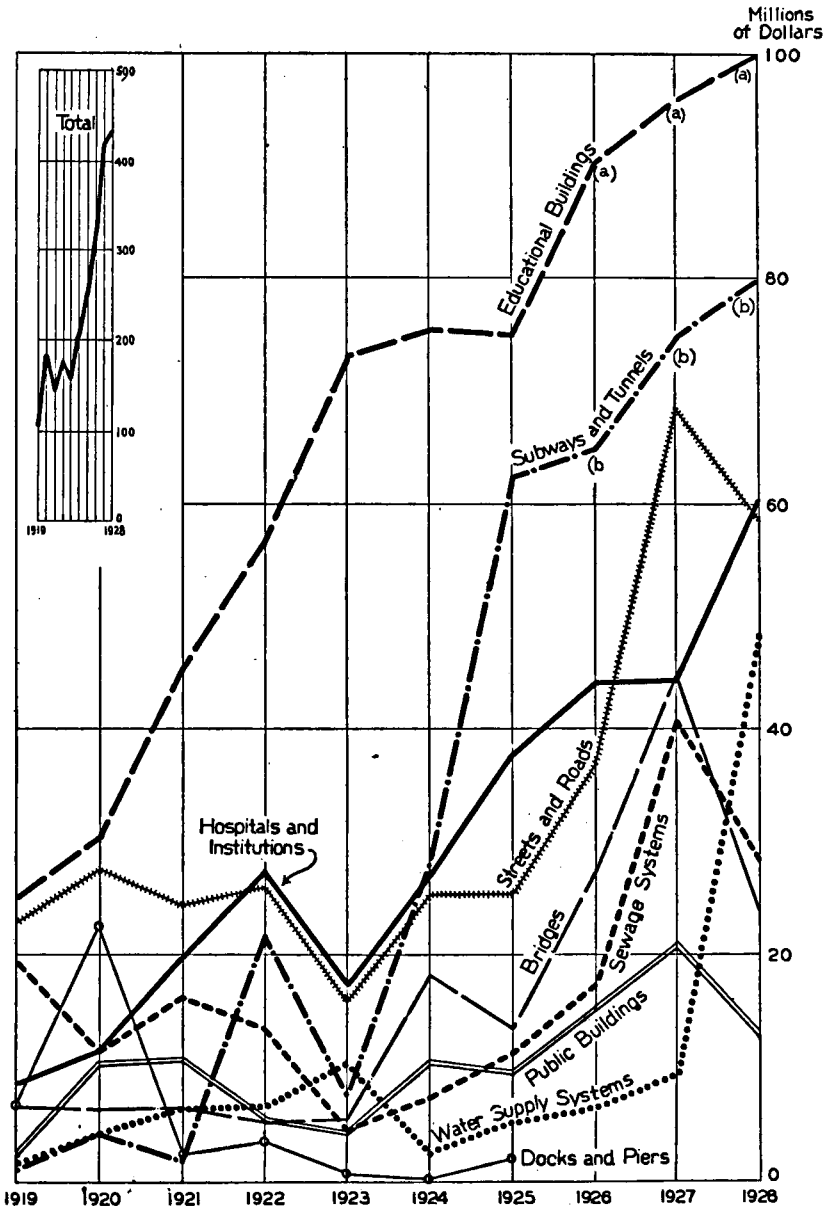
<sup>c</sup> Less than 0.05%.

<sup>d</sup> Not reported in these three years.

<sup>e</sup> Not reported in these three years. Figures represent estimates of subway construction in New York City.

<sup>f</sup> Estimated.

CHART 2.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN 14  
SELECTED CITIES, COMBINED, 1919-1928



(a) Includes Private Schools in 1926, 1927, 1928

(b) Represents Subway Construction in New York City alone  
in 1926, 1927, 1928.



expenditures topped all others, with water, schools, streets and sewers and docks following in the order mentioned. Such an order may be only temporary, but the differences in the amounts of indebtedness incurred for the different purposes are so great, and the city's borrowing-margin is so limited, that some time must elapse before these relative positions are materially modified." <sup>3</sup>

A view of the probable expenditures for public construction by cities is given in Table 2, which shows the combined contracts for public construction awarded in 14 selected cities for each year from 1919 to 1928.<sup>4</sup> Contracts awarded are not a precise measure of the amount actually expended for construction during the period indicated, or of the volume of work under way or completed. There are indeed frequently great discrepancies between the volume of contracts awarded and the amount expended.<sup>5</sup> In the absence of other measures, however, the figures furnished by the F. W. Dodge Corporation are a reliable representation of the volume, trend and distribution of expenditures for public construction.

Between 1919 and 1928 these 14 municipalities quadrupled their expenditures for public works. If New York City were omitted from the totals, the rate of increase for the remaining cities would be somewhat slower. In general, the large cities appear to have increased their public works expenditures much more rapidly than the smaller ones. Occasionally, also, the picture is distorted when a single city undertakes a new program of public improvements and contracts for construction are concentrated in a few years. Thus contracts awarded in St. Louis<sup>6</sup> jumped from \$1,700,000 in 1919 to more than \$18,000,000 in 1928, due, in the main, to large increases in the latter year in contracts for hospitals and institutions, bridges, lighting systems, and street paving and road construction.

Throughout the period since 1919, school buildings are the

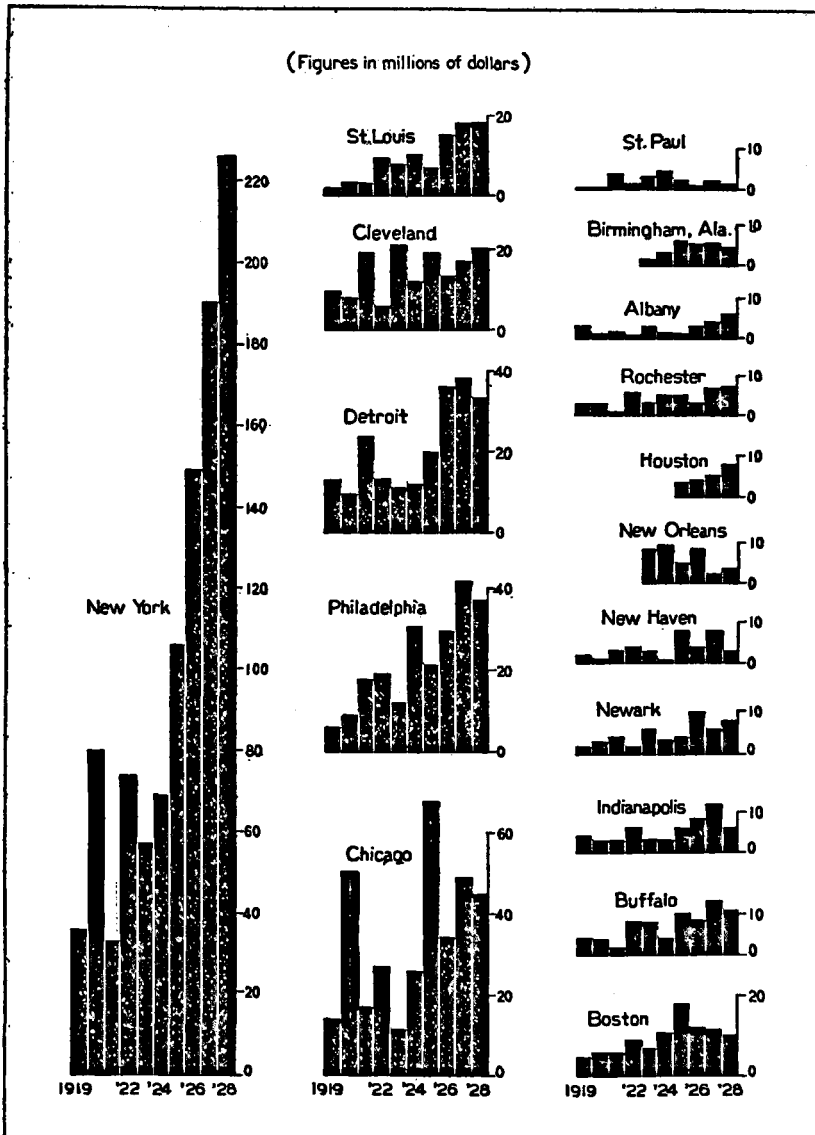
<sup>3</sup> *The Finances and Financial Administration of New York City: Recommendations and Report of the Sub-Committee on Budget, Finance and Revenue of the City Committee on Plan and Survey, 1928*, p. 190. This report will hereafter be referred to as *Lehman*.

<sup>4</sup> See Appendix A, Tables 1-17. These tables show public contracts awarded in each of 14 selected cities from 1919 through 1928, and in 3 additional cities for which no material is available before 1923.

<sup>5</sup> See below, Chapter V, pp. 120-122.

<sup>6</sup> Appendix A, Table 16.

CHART 3.—TOTAL PUBLIC CONSTRUCTION CONTRACTS AWARDED  
IN 17 SELECTED CITIES, 1919-1928



Source : F. W. Dodge Corporation, Statistical Division

largest single item. Contracts for school buildings, hospitals and institutions, and public buildings of other character give a total for this group that accounts usually for more than one-third of the whole of public construction contracts. The next largest items are subways and tunnels, heavily weighted by the subway construction contracts of New York City, and sewage systems and streets and roads. Contracts for water supply construction run uniformly low throughout the period, except in the last year when New York City accounts for more than 90 per cent of the contracts awarded for this purpose. The construction of public parks involves expenditures in most years of this last decade of less than one per cent of the total.

The growth of city expenditures for public works is not an isolated phenomenon. It has its counterpart in the rising outlays since 1919 of all American units of government, and in the equally striking increase in the expenditures for private construction. To compare the rate of rise in public expenditures for construction with the rate of increase of other series that measure economic growth is not a simple task, because it is not clear what the arithmetical relation between these rates of growth should be. All that can be said is that increasing expenditures on public works have taken place in a period in which the income of the people of the United States has grown with great rapidity, when the capacity to pay taxes and to absorb bonds has been greater than before, and when the assessed valuation of property, even allowing for defects in the methods of measuring assessed valuation, has also mounted to new and higher levels.

The wide range of problems that surround the past and future construction programs of American municipalities are considered in detail elsewhere in this book.<sup>7</sup> As with private construction, expanding programs of public improvement involve difficult problems of financing. Growing burdens of taxation and steady encroachment on more or less rigid debt limits frequently constitute the forces that slacken the rate of increase of public construction and keep it for a time on a low level. The vast number of public agencies concerned with administering these projects make unusually difficult the adoption of a procedure that might lead to greater uniformity and a larger measure of control. On the other hand, the

<sup>7</sup> Chapters VII, VIII and IX.

TABLE 3. — ASSESSED VALUATION OF PROPERTY SUBJECT TO GENERAL PROPERTY TAX IN  
SELECTED CITIES, 1919-1928

(In thousands)

Year	Type	NEW YORK CITY		CHICAGO			PHILADELPHIA		DETROIT		ALL CITIES OVER 30,000
		Assessed Valuation	Reported Basis of Assess- ment <sup>a</sup> %	Assessed Valuation	Reported Basis of Assess- ment <sup>a</sup> %	100% Basis	Assessed Valuation	Reported Basis of Assess- ment <sup>a</sup> %	Assessed Valuation	Reported Basis of Assess- ment <sup>a</sup> %	Assessed Valuation
1919	Real property .....	\$ 8,428,323	100	\$ 757,915	25	\$3,031,660	\$1,823,961	100	\$1,003,492	100	\$31,219,989
	Personal property .....	862,413	100	276,745	25	1,106,980	703,668	100	372,469	100	7,750,789
1920	Real property .....	8,626,122	100	b	b	b	b	b	b	b	b
	Personal property .....	296,506	100	b	b	b	b	b	b	b	b
1921	Real property .....	9,972,985	106	1,166,212	40	2,915,530	2,135,731	100	.	.	28,921,846
	Personal property .....	213,222	100	410,447	40	1,026,118	708,984	100	.	.	6,867,575
1922	Real property .....	10,249,992	.	1,176,571	.	.	2,320,411	.	1,490,015	.	41,932,420
	Personal property .....	210,608	.	415,883	.	.	723,820	.	464,169	.	10,170,420
1923	Real property .....	10,598,066	100	1,297,355	35	3,708,729	2,630,333	100	1,621,276	100	43,982,896
	Personal property .....	216,623	100	416,009	25	1,664,036	791,257	100	488,714	100	10,560,939
1924	Real property .....	11,148,811	100	1,292,942	35	3,694,120	2,768,876	100	1,916,045	100	47,745,756
	Personal property .....	231,174	100	414,853	25	1,659,412	860,590	100	539,283	100	11,055,036
1925	Real property .....	11,901,349	100	1,356,609	35	3,876,026	3,035,077	100	2,185,646	100	51,503,292
	Personal property .....	239,508	100	431,342	25	1,725,368	932,733	100	572,018	100	11,429,848
1926	Real property .....	12,997,581	100	1,403,963	35	4,011,323	3,169,537	100	2,570,109	100	55,739,082
	Personal property .....	258,988	100	387,478	25	1,549,912	1,028,719	100	586,148	100	11,559,093
1927	Real property .....	14,539,838	100	3,247,359	70	4,639,084	3,325,585	100	2,778,907	100	61,620,099
	Personal property .....	297,984	100	822,561	50	1,645,120	1,128,975	100	615,428	100	12,201,466
1928	Real property .....	15,845,506	100	d	d	d	d	d	d	d	d
	Personal property .....	308,440	100	d	d	d	d	d	d	d	d

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SOURCE: New York City Assessed Valuation from New York City, Comptroller's Annual Reports. Other figures from United States Bureau of the Census, *Financial Statistics of Cities*.

<sup>a</sup> For most cities this figure is an estimate, furnished by city officials, of the percentage which the assessed valuation of property forms of its true value. See, for example, United States Bureau of the Census, *Financial Statistics of Cities*, 1927, p. 62. It is impossible to estimate how reliable these figures are. They are no doubt subject to a wide margin of error; but it seemed advisable to present the table as published by the Bureau of the Census instead of attempting to correct these estimates by the use of such inadequate data as are available.

<sup>b</sup> No volume of *Financial Statistics of Cities* for 1920 was published.

<sup>c</sup> Data not given.

<sup>d</sup> *Financial Statistics of Cities* for 1928 not yet available.

## THE EXPENDITURES OF CITIES

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sheer magnitude of public enterprises and their almost certain growth during the next decades has forcibly turned the attention of many public officials to the need for more deliberate planning and has, in some instances, led to the creation of new agencies charged with just this function.

## CHAPTER II

### PUBLIC WORKS IN NEW YORK CITY

Public, like private construction, lagged in this country considerably during the war and did not begin its strong upward movement until after 1922. The low level of expenditures in New York City from 1919 to 1922, shown in the following tabulation, reflected not only the influence of general economic conditions, but also the adoption in 1916 of a new financial policy by the city government. "The outbreak of war in Europe, the temporary closing of the Stock Exchange, and generally unsettled banking conditions

Year	Expenditures On Public Works (thousands)	Estimated Population (thousands)	Per Capita Expendi- tures
1919	\$29,774	5,570	\$5.35
1920	39,208	5,620	6.98
1921	71,467	5,670	12.60
1922	56,635	5,720	9.90
1923	75,769	5,770	13.13
1924	120,944	5,820	20.78
1925	132,871	5,870	22.64
1926	131,394	5,920	22.19
1927	143,545	5,970	24.04
1928	132,721	6,020	22.05

here and abroad left the city unable to borrow for temporary needs or permanent improvements. The city's bonds had hitherto been sold extensively in foreign markets. These were now closed. An appeal had to be made to the banking institutions of the city. A syndicate was formed to loan the city \$100,000,000 for three years at six per cent. In granting this loan the syndicate stipulated that the city change its policy of financing permanent improvements" <sup>8</sup> by ceasing to borrow for permanent improvements that were not self-supporting.

<sup>8</sup> *Lehman*, pp. 209-210. The present chapter has drawn largely upon this report.

Because of the heavy burden which this pay-as-you-go policy for the financing of permanent improvements imposed upon the taxpayer, the method was soon abandoned and the city reverted in a number of instances to financing by long-term borrowing. This change, the pressing need for public works such as large public buildings and schools, and the rising tide of business, all contributed to the great increase in the expenditures on public construction in New York City in the years after 1922.

While the evidence is not conclusive, and is somewhat impaired by the lack of comparability between the measures of the volume of public construction in New York City and in the whole country, there is reason to believe that an increasing share of the total public construction of the United States is represented by New York City. The tabulation below, which shows the relation between the population of New York City and the population of 27 states,\* on the one hand, and the relation between contracts awarded by New York City for public works and contracts for public construction awarded in the same 27 states, on the other, gives an interesting picture of the changing relative position of New York City.

Year	Percentage New York City Population is of Population of 27 States	Percentage New York City Contracts for Public Works are of Public Works Contracts in 27 States
1919	7.5	5.8
1920	7.5	10.4
1921	7.6	4.3
1922	7.5	8.1
1923	7.5	6.9
1924	7.4	7.6
1925	7.3	10.1
1926	7.3	12.0
1927	7.2	12.8
1928	7.2	14.4

Construction expenditures of New York City originate in a variety of administrative departments and are financed by diverse methods. A summary of these expenditures since 1919 and their

\*The 27 states here included are those for which the F. W. Dodge Corporation publishes a continuous series of construction contracts awarded since 1919.

## 20 PLANNING AND CONTROL OF PUBLIC WORKS

classification into principal types of work is given in Table 4.<sup>10</sup> In all years the bulk of spending is done for subways, streets, roads and parkways, and buildings, largely school buildings. In the last three years subways account for considerably more than one-third of the total.

**Procedure and Financing of Public Works.**—The methods employed by American municipalities in planning permanent public improvements and in carrying them through to final completion are the product of historical accident, changes in political structure, and exigencies of the moment. Although the steps required to undertake the complete public construction projects in New York City may differ in detail from the procedure that prevails in other cities, full description of the process in New York City will throw considerable light on the nature of public works programs everywhere and on the forces that, from time to time, retard or accelerate them. In New York City, as elsewhere in this country, the striking characteristic of public works procedure is the lack of the machinery for deliberate, forward planning, except possibly in the construction of subway and water-supply systems.

Budget-making for all of the ordinary expenditures of the city is still a more or less casual process. The budget document of New York City is little more than an itemized appropriation ordinance. It contains no estimate of the income that is expected to meet proposed expenditures. The steps involved in its preparation are as follows: early in the spring the Board of Estimate requests the heads of 165 departments, boards and bureaus to prepare and submit their estimates of all expenditures for the coming year. It is expected that the departmental estimates will be submitted by July 10th, although the time limit set by the City Charter for their submission is August 1st. They are not, however, all received even by the latter date, but keep coming in throughout July, August and September. Numerous supplementary departmental estimates not mentioned in the Charter are submitted even as late as October, the date when the Committee of the Whole of the Board of Estimate is required to approve of the tentative budget.

When received by the secretary of the Board, the departmental

<sup>10</sup> The figures in this table represent actual expenditures and are, therefore, not strictly comparable with the figures in Appendix A, Table 13, which are the Dodge record of public contracts awarded in New York City. Further analysis of these two sets of statistics are given below in Chapter V, pp. 120-124.



TABLE 4. — EXPENDITURES ON PUBLIC CONSTRUCTION IN NEW YORK CITY, 1919-1928\*  
(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Subways.....	\$11,975	\$ 7,764	\$ 6,965	\$ 4,224	\$ 5,927	\$ 8,641	\$18,583	\$50,849	\$64,356	\$57,636
Streets, roads and parkways <sup>b</sup> .....	8,306	10,257	13,759	12,738	15,747	23,828	29,982	32,808	36,677	31,170
Buildings <sup>c</sup> .....	3,346	5,791	13,227	14,500	25,155	59,441	48,831	22,373	22,003	24,201
Water supply systems, etc.....	2,096	2,430	6,365	10,704	14,501	12,145	8,919	7,833	7,701	6,215
Docks and ferries, etc.....	339	6,465	17,277	6,101	4,546	4,436	9,766	5,755	3,768	5,807
Borough presidents <sup>d</sup> .....	3,816	5,135	12,405	6,330	6,927	8,952	14,425	9,663	6,765	4,663
Parks and park buildings.....	61	1,200	1,445	1,895	2,860	3,501	2,275	1,763	1,775	1,970
Miscellaneous.....	15	166	24	143	106	....	90	350	500	1,059
<b>Total expenditures.....</b>	<b>\$29,774</b>	<b>\$39,208</b>	<b>\$71,467</b>	<b>\$56,635</b>	<b>\$75,769</b>	<b>\$120,944</b>	<b>\$132,871</b>	<b>\$131,394</b>	<b>\$143,545</b>	<b>\$132,721</b>

Sources: New York City, Comptroller's *Annual Reports*.

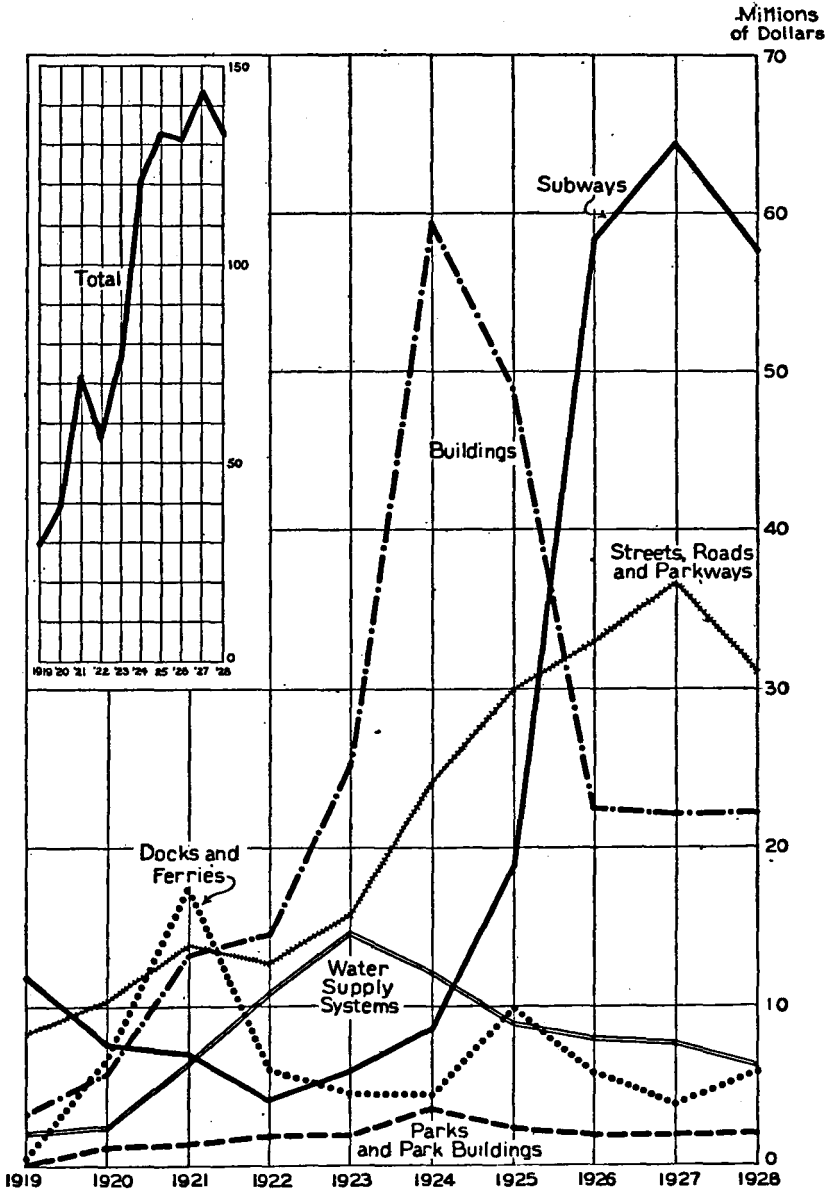
\* The figures include all expenditures, however financed, for new construction and reconstruction, but omit maintenance and operation costs.

<sup>b</sup> Includes expenditures by Borough Presidents from Special Revenue Bonds, all of which were for paving and repaving streets and avenues.

<sup>c</sup> Expenditures mainly for school construction.

<sup>d</sup> Excludes expenditures by Borough Presidents from Special Revenue Bonds included in footnote <sup>b</sup>. This class represents miscellaneous building to some extent but the greater part is for renovating and resurfacing streets.

CHART 4.—EXPENDITURES ON PUBLIC CONSTRUCTION IN NEW YORK CITY, 1919-1928.



estimates are assigned to the 35 examiners of the Board of Estimate. Each examiner studies the estimates under his jurisdiction and holds conferences with the specified department head and the Director of the Budget. Estimates with attached recommendations are then forwarded on or before October 4th to the Committee of the Whole of the Board of Estimate. This body holds hearings with departmental heads on the estimates, and on or before October 10th adopts a printed tentative budget. Public hearings are again held later to consider principally additions to the tentative budget. Before October 20th the Board must file with its secretary a budget known as the Proposed Budget. Before this filing date items of the budget may be increased or new ones added, but after October 20th revision can only be downward or by elimination. After public hearings are held on the proposed budget, the final budget is adopted on or before October 31st. Five days after the budget has been passed by the Board of Estimate it must go to the Board of Aldermen, which is given twenty days for its consideration. But this body has practically foresworn any part in budget-making. Deliberations on the budget, so far from twenty days, consume on some occasions no more than twenty minutes. Not over four or five times in the past thirty years has the Board of Aldermen made any change in a budget.

**Capital Outlays on Public Improvements.**—The budget includes very few items for permanent improvements. The several small items for permanent improvements included in it, such as armory buildings, park improvements, construction of a municipal airport, expenses of engineering forces engaged on construction and designing of the new subways amount, in the aggregate, to a sum relatively not large. Capital outlays on permanent improvements are financed, for decidedly the greater part, by issue of long-term corporate stock or bonds. If emergency funds were required in times of depression for the relief of unemployment through an increased volume of expenditures on public works, it would matter little that the procedure involved in making budget appropriations is long and cumbersome, provided only that these unusual expenditures did not come out of current revenue but were financed by the issue of long-term bonds or by temporary borrowing. Capital expenditures in New York City are not planned in any comprehensive manner, except in the case of subways and water supply. Various projects are authorized from time to time during the year,

## 24 PLANNING AND CONTROL OF PUBLIC WORKS

and the tax budget is adopted in November with no indication of the outlays which the city will make from the proceeds of the sale of bonds.

The procedure involved in the authorization of capital issues is as follows: the various departments submit, at its request, to the Board of Estimate, usually in December (but also at various times during the year for specific projects), a list of items deemed urgent and their requests for a given amount of corporate stock or tax notes for these desired improvements. These items are placed either on the current calendar of the Board or else on a special calendar of the Committee of the Whole printed early in the year—the so-called corporate stock and tax note calendar. As new items are added the calendar is revised or supplements to it are prepared. Items are picked from this calendar, acted upon by the Board of Estimate and approved early in the year. Thereafter specific new items are received and then considered by the Board through the Committee of the Whole. No special order is observed in the consideration of the items, except when the corporate stock budget is considered, nor is an attempt made to formulate a budget or program of capital expenditures. Authorizations are thus made in a piecemeal fashion and not all at one time as is the case with tax budget expenditures.

The city is not required to issue bonds and have cash actually in hand before proceeding with the execution of a project. The authorization is itself considered as equivalent to an appropriation and contracts may be immediately awarded. When obligations incurred in this way become payable, that is, when the contractors present their bills, money is secured by the issuance of corporate stock notes which mature within a period of one year, unless renewed or converted into long-term stock.

In short, the procedure is as follows:

1. Requests by the departments are made to the Board of Estimate directly or indirectly.
2. Authorizations are made by the Board at any time during the year.
3. Contracts are awarded.
4. Corporate stock notes are issued in liquidation of the obligations incurred.
5. These notes are converted into long-term stock.

Borrowing by New York City is usually preceded by the issue of corporate stock notes. Long term obligations therefore are not incurred until the expenditures have been made. It is argued that such an arrangement is more economical than that obtaining in many cities which issue bonds when the project is authorized and in advance of its execution, since it enables the city to choose the most favorable time for the issuance of its long term stock or bonds. It may also put its obligations on the market in large blocks of \$50,000,000 or \$60,000,000 to attract active bidding.

Should no sale of long-term stock occur before their maturity, corporate stock notes may be renewed and the renewals redeemed from the next sale of stock. The total amount of such notes and renewals must at no time exceed four-fifths of the amount of corporate stock or serial bonds authorized to be issued.

Thus the city is in a position to provide, rapidly and at short notice, for the financing of any public project which it desires to undertake. Large funds can thus be raised in the New York money market at almost a moment's notice on the authorization of the Comptroller. At times when the conditions for borrowing are considered unfavorable—as in the recent period of inflation and high interest rates—it is still possible, if the money is urgently required, to issue short-term certificates—corporate stock notes—which need not be converted into long-term issues for a year, or if renewed, for longer periods. Granted willingness, therefore, on the part of the city authorities to enlarge their volume of borrowing for an increased volume of public works, the only restriction that might hamper speedy action by them would be the limitation set by the state constitution to the city's outstanding indebtedness.

**The Forms of Temporary Borrowing.**<sup>11</sup>—There are, strictly speaking, four varieties of temporary borrowing; one of these is in anticipation of taxes, and one of long term borrowing; the others are for appropriations supplemental to tax budget appropriations.

1. Revenue bills are issued in anticipation of the collection of taxes. They run for short periods of varying duration, at rates of interest depending on the state of the money market.

2. Corporate stock notes, the second form of anticipatory temporary borrowing, are short term obligations issued pending the flotation of long term bond issues.

3. Special revenue bonds provide for supplementary appropria-

<sup>11</sup> See Appendix C.

tions. They must be redeemed out of the tax receipts of the succeeding year, and the necessary appropriations for their redemption must be made in the current budget. They are used for a variety of purposes but, in the main, where cost cannot easily be estimated in advance, as for the removal of snow. They are likewise issued to meet certain emergency appropriations. Only in the case of appropriations to the Armory Board are special revenue bonds issued by the city for capital improvements.

4. Tax notes, the most recent form of temporary borrowing, were first used in 1916. They resemble special revenue bonds in that they must be redeemed in the budget of the next succeeding year. They can be issued for any non-revenue-producing public improvements approved by the Board of Estimate.

**The Forms of Long Term Borrowing.**—There are three categories of long term borrowing:

1. Corporate stock,<sup>12</sup> properly so called, is redeemed by the payment into a sinking fund of annual amortization charges.
2. Serial bonds are characterized by the annual maturity and retirement of a specified, usually equal, part of the total issue.
3. Assessment bonds are used to assist in the financing of the

<sup>12</sup> The term "Corporate Stock" is loosely used to designate both ordinary varieties of long term bonds (whether serial bonds or corporate stock properly so called). It is so used as a heading for accounts of expenditures financed in this way in the *Annual Reports* of the Comptroller; nor do these itemized accounts of expenditures by departments specify the precise type of "Corporate Stock" issued to finance the given work in question. The usage of the Comptroller's reports has therefore been followed in making up tables. It should consequently be observed that these corporate stock fund accounts include expenditures financed by serial bonds. The financing of the expenditures shown was in fact for very much the greater part by means of corporate stock issues, properly so called. Serial bonds have hitherto been used to a much lesser extent. It should further be observed with regard to Table 5, that though corporate stock is the ordinary type of long term bond issue, expenditures financed in this way are usually financed in the first instance by the issue of corporate stock notes (i.e., by temporary anticipatory borrowing) pending the issuance of the bonds themselves. The figures in the corporate stock fund accounts are for expenditures on public works financed in this manner irrespective of whether or not the corporate stock notes had yet been converted into long term corporate stock. Table 7, also, includes expenditures financed by means of assessment bonds, another method of long term borrowing. Assessable improvements are financed through two revolving funds, the Street Improvement Fund (used for physical improvements) and the Fund for Street and Park Openings (for acquisition of property). These two funds are recouped by the payments of assessments to the city, but the Comptroller can issue ten year assessment bonds (which form part of the city's debt), to be redeemed out of the funds. For fuller details regarding each of the above methods of financing public works, see Appendix C.

Street Improvement, and the Street and Park Opening Funds, which defray the cost of paving, curbing, sewer-building, drainage, and other similar assessable improvements, together with the cost of lands acquired for these purposes. The greater part of the assessment bonds outstanding are held by the city sinking funds.

New York borrows annually for public improvements well over \$100,000,000 through long term obligations. Corporate stock is generally issued for a term of 50 years; serial bonds usually for shorter terms; and assessment bonds have maturities of ten years or less.

**Sources and Nature of Expenditures on Permanent Improvements.**—With these classifications of the forms of temporary and permanent borrowings in mind, it is possible to survey the total expenditures by New York City for public works, in terms of the methods whereby they are financed by the administrative agencies that make the expenditures. A summary of the situation is shown in Table 5, which is a consolidated tabulation of the detailed items. It is clear from this table that the bulk of permanent improvements is financed out of corporate stock, serial bonds and assessment bonds. The city accounting is such, however, that it is impossible to break this category down.

Some notion of the confusion involved in the expenditures by New York City, and for that matter by most agencies of government, is shown in Tables 6-9, where these expenditures are classified both by the type of financing and by the administrative department concerned with the execution of the work.<sup>18</sup> The use of the expression "warrants paid" in Tables 6-9, requires further explanation. In the reports of the Comptroller a number of different columns are given against each appropriate item. With regard to the expenditures, three columns are of particular interest. They are headed, respectively, Net Vouchers Registered, Net Warrants Registered, and Warrants Paid. The figures in Tables 6-9 represent totals of warrants actually paid during the year. There is usually only a very slight difference between the figures for the same item which appear in the three columns, so that it does not make a great deal of difference which one is used. The vouchers registered perhaps better represent the actual volume of work executed in any given year, since the vouchers are presented as soon as payment is due. The warrants paid, however, give the exact figure for actual expenditures in any year. The time lag between the regis-

<sup>18</sup> For explanatory notes to Tables 5-9, see Appendix B.

**TABLE 5. — EXPENDITURES ON PUBLIC CONSTRUCTION, CLASSIFIED BY COMPREHENSIVE TYPES  
AND DIFFERENT METHODS OF FINANCING IN NEW YORK CITY, 1919-1928**  
(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
<b>Special Revenue Bonds</b>										
Buildings.....	.....	.....	.....	.....	.....	.....	.....	\$123	\$235	\$190
Borough presidents, five boroughs.....	\$395	\$1,297	\$1,342	\$842	\$688	\$1,366	\$875	551	963	403
Miscellaneous.....	15	166	.....	143	77	.....	90	350	500	650
<b>Total Special Revenue Bonds .....</b>	<b>\$410</b>	<b>\$1,463</b>	<b>\$1,342</b>	<b>\$985</b>	<b>\$765</b>	<b>\$1,366</b>	<b>\$965</b>	<b>\$1,024</b>	<b>\$1,698</b>	<b>\$1,243</b>
<b>Corporate Stock, Serial Bonds and Assessment Bonds</b>										
Subways.....	11,795	7,764	6,965	4,213	5,927	8,641	18,566	50,733	64,146	57,455
Water supply systems, etc.....	2,096	2,430	6,354	10,704	14,474	12,141	8,886	7,823	7,668	6,095
Streets, roads and parkways.....	7,190	7,742	11,220	10,579	13,721	20,844	26,887	30,285	26,850	22,006
Docks and ferries, etc.....	339	6,465	16,666	5,626	3,758	4,051	8,654	4,024	2,285	3,236
Buildings.....	3,346	5,791	12,939	14,218	24,268	58,046	47,264	19,981	19,642	22,427
Parks and park buildings.....	61	1,200	1,296	1,426	1,526	2,043	1,110	526	270	141
Borough presidents, five boroughs.....	3,816	5,135	8,413	5,628	5,524	4,262	4,393	1,593	2,533	2,237
<b>Total Corporate Stock, Serial Bonds and Assessment Bonds .....</b>	<b>\$28,643</b>	<b>\$36,527</b>	<b>\$63,853</b>	<b>\$52,394</b>	<b>\$69,198</b>	<b>\$110,028</b>	<b>\$115,760</b>	<b>\$114,965</b>	<b>\$123,394</b>	<b>\$113,597</b>
<b>Tax Notes</b>										
Subways.....	b	b	.....	11	.....	.....	17	116	210	181
Water supply systems, etc.....	b	b	11	.....	27	4	33	10	33	120
Streets, roads and parkways.....	b	b	.....	.....	.....	3	497	247	14	18
Docks and ferries, etc.....	b	b	611	475	788	385	1,112	1,731	1,483	2,431
Buildings.....	b	b	288	282	887	1,395	1,567	2,269	2,011	1,482
Parks and park buildings.....	b	b	149	469	1,334	1,458	1,165	1,237	1,505	1,829
Borough presidents, five boroughs.....	b	b	3,992	702	1,403	4,690	10,032	8,070	4,232	2,426
Miscellaneous.....	b	b	24	.....	29	.....	.....	.....	.....	409
<b>Total Tax Notes.....</b>	<b>b</b>	<b>b</b>	<b>\$5,075</b>	<b>\$1,939</b>	<b>\$4,468</b>	<b>\$7,935</b>	<b>\$14,423</b>	<b>\$13,680</b>	<b>\$9,488</b>	<b>\$8,896</b>
<b>Special Accounts</b>										
Buildings.....	.....	.....	.....	.....	.....	.....	.....	.....	115	102
Docks.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	140
Restoring and repaving streets, borough presidents	721	1,218	1,197	1,317	1,338	1,615	1,723	1,725	1,850	1,743
<b>Total Special Accounts.....</b>	<b>\$721</b>	<b>\$1,218</b>	<b>\$1,197</b>	<b>\$1,317</b>	<b>\$1,338</b>	<b>\$1,615</b>	<b>\$1,723</b>	<b>\$1,725</b>	<b>\$1,965</b>	<b>\$1,985</b>
<b>Expenditures from Current Revenue*</b> .....	.....	.....	.....	.....	.....	.....	.....	.....	7,000	7,000
<b>Grand Total.....</b>	<b>\$29,774</b>	<b>\$39,208</b>	<b>\$71,467</b>	<b>\$56,635</b>	<b>\$75,769</b>	<b>\$120,944</b>	<b>\$132,871</b>	<b>\$131,394</b>	<b>\$143,545</b>	<b>\$132,721</b>

SOURCE: New York City, Comptroller's *Annual Reports*.

\* These are, strictly speaking, tax budget appropriations for repaving and resurfacing streets.

<sup>b</sup> No separate statement is given during 1919 and 1920. During these two years expenditures financed out of tax note issues are included in the Corporate Stock Fund Account. Tax notes issued amounted to \$2,050,000 in 1919 and to \$4,250,000 in 1920.



TABLE 6. — EXPENDITURES ON PUBLIC CONSTRUCTION FINANCED BY BOND ISSUES IN NEW YORK CITY, 1919-1928<sup>a</sup>.

SPECIAL REVENUE BOND FUND ACCOUNT

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Armory Board.....	...	...	...	...	...	...	...	\$123	\$235	\$190
President, Borough of Brooklyn.....	\$19	\$229	\$470	\$170	\$92	\$81	\$120	119	67	59
President, Borough of Manhattan....	118	587	213	181	240	695	345	171	635	303
President, Borough of Queens.....	106	63	273	271	175	150	105	53	80	15
President, Borough of Richmond....	77	227	124	53	54	77	9	28	30	7
President, Borough of The Bronx....	75	191	262	167	127	363	296	180	151	19
Miscellaneous.....	15	166	...	143	77	...	90	350	500	650
Total.....	\$410	\$1,463	\$1,342	\$985	\$765	\$1,366	\$965	\$1,024	\$1,698	\$1,243

SOURCE: New York City, Comptroller's *Annual Reports*, Statement Q 1.

<sup>a</sup> Figures are for warrants paid during the course of each year. Expenditures on the acquisition of land have been excluded throughout.

TABLE 7.—EXPENDITURES ON PUBLIC CONSTRUCTION FINANCED BY BOND ISSUES IN NEW YORK CITY, 1919-1928\*.

CORPORATE STOCK, SERIAL BOND AND ASSESSMENT BOND FUND ACCOUNTS

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Armory Board.....	\$ 167	\$ 78	\$ 136	\$ 122	\$ 487	\$ 140	\$ 133	\$ 190	\$ 66	\$ 3
Bellevue and Allied Hospitals.....	9	60	....	12	12	588	2,671	1,208	1,200	2,104
Department of Public Welfare.....	919	195	1,275	597	306	152	181	706	1,212	1,438
Construction of New County Court House, Man- hattan.....	....	507	942	773	3,259	503	2,450	2,923	1,414	153
Department of Plant and Structures <sup>b</sup> .....	150	523	2,549	2,899	2,791	3,470	5,251	2,422	885	1,280
Department of Public Markets.....	....	....	....	....	307	1,560	2,352	1,554	1,350	444
Department of Correction.....	383	151	51	15	20	8	....	....	....	....
Board of Education <sup>c</sup> .....	1,577	4,679	10,069	12,010	8,060	52,614	38,313	13,068	13,709	17,006
College of the City of New York.....	4	....	....	....	....	....	....	....	12	922
Board of Higher Education.....	....	....	....	....	....	....	....	....	....	27
Public libraries.....	....	....	....	....	....	19	14	....	....	47
Department of Parks, Manhattan.....	41	759	415	505	1,149	1,187	872	480	219	77
Department of Parks, Brooklyn, The Bronx, etc.....	20	441	881	921	377	856	238	46	51	64
Westchester County Park (Bronx Parkway) Com- mission.....	162	747	1,160	587	435	1,483	333	45	....	....
Brooklyn-Richmond Tunnel.....	....	....	40	197	789	1,100	108	....	....	....
Department of Health.....	30	22	36	88	98	32	....	54	406	185
Police Department.....	15	2	6	224	200	450	315	160	83	80
Department of Street Cleaning.....	32	1	65	53	1,111	1,809	733	76	190	18
President, Borough of Brooklyn.....	1,096	1,187	2,324	1,511	1,219	1,580	3,609	1,355	490	696
President, Borough of Manhattan.....	1,150	1,618	2,954	1,746	2,189	1,402	80	99	1,530	1,245
President, Borough of Queens.....	518	541	1,004	954	678	445	518	92	249	244
President, Borough of Richmond.....	322	318	555	257	468	384	62	43	260	51
President, Borough of The Bronx.....	732	1,471	1,576	1,160	970	451	124	4	4	1
Board of Water Supply <sup>d</sup> .....	1,848	1,729	5,048	8,743	11,567	6,707	3,985	2,619	1,365	1,107
Department of Water Supply, Gas and Electricity ..	248	701	1,306	1,961	2,907	5,434	4,901	5,204	6,303	4,988
Department of Docks <sup>e</sup> .....	189	5,937	14,117	2,727	967	581	3,403	1,602	1,400	1,956
Fire Department.....	230	96	359	324	318	171	102	42	....	....
Board of Transportation (Rapid Transit Construc- tion Fund) <sup>f</sup>										
Contract No. 1.....					144	162	60	133	26	11
Contract No. 2.....					....	728	....	....	....	....
Contract No. 3.....	11,795	7,764	6,925	4,016	2,553	4,590	4,782	3,271	1,960	465
Contract No. 4.....					2,141	2,018	7,357	7,898	10,100	6,876
Other contracts (Ft. Washington Route, etc.)..					....	43	6,259	39,431	52,080	50,103
Street Improvement Fund <sup>g</sup> .....	7,028	6,995	10,060	9,992	13,286	19,361	26,554	30,240	26,850	22,006
<b>Total.....</b>	<b>\$28,643</b>	<b>\$36,527</b>	<b>\$63,853</b>	<b>\$52,394</b>	<b>\$89,198</b>	<b>\$110,028</b>	<b>\$115,780</b>	<b>\$114,965</b>	<b>\$123,394</b>	<b>\$113,597</b>

Source: New York City, Comptroller's Annual Reports, Statement R.

\* Figures are for warrants paid. Cost of land has been excluded throughout.

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Includes ferryboat construction and purchase, which cost.....	....	....	\$632	\$202	\$424	\$560	\$627	\$950	\$188	\$430
Excludes expenditures on acquisition of sites, which cost.....	\$942	\$395	855	1,580	2,520	3,886	4,705	6,060	3,606	7,039
Excludes expenditures on acquisition of land, which cost.....	531	628	471	333	343	144	119	81	235	326
Excludes acquisition of sites, which cost...	....	....	....	....	....	....	....	....	17,000	....
Excludes expenditures on acquisition of sites, which cost.....	....	....	....	....	....	....	....	....	....	18,137
Excludes expenditures on acquisition of land which came out of Fund for Street and Park Openings (Assessment Bonds), as follows.....	4,348	11,324	4,430	2,305	2,310	2,387	10,006	8,847	12,425	24,354

TABLE 8. — EXPENDITURES ON PUBLIC CONSTRUCTION FINANCED BY BOND ISSUES IN NEW YORK CITY, 1921-1928\*.

TAX NOTE FUND ACCOUNTS

(In thousands)

Purpose	1921	1922	1923	1924	1925	1926	1927	1928
Armory Board.....	\$ 10	....	....	....	....	....	\$ 74	\$ 51
Bellevue and Allied Hospitals.....	....	\$ 12	\$ 19	....	....	....	....	2
Board of Transportation (subways).....	....	11	....	....	17	116	210	181
Department of Public Welfare.....	85	114	17	49	152	901	663	179
Westchester County Park (Bronx Parkway) Commission.....	....	....	....	3	497	247	14	18
Department of Plant and Structures.....	588	450	713	363	1,102	1,731	1,460	2,010
Department of Correction.....	29	5	4	9	....	....	23	80
Department of Docks.....	23	25	75	22	10	....	23	421
Board of Education.....	7	15	535	787	685	314	287	121
Department of Health.....	2	....	....	....	109	103	75	5
Department of Parks, Brooklyn.....	5	135	586	689	315	205	445	603
Department of Parks, Manhattan.....	133	161	355	407	359	475	479	506
Department of Parks, Queens.....	....	91	155	71	154	185	353	309
Department of Parks, Richmond.....	....	42	24	23	45	104	114	165
Department of Parks, The Bronx.....	11	40	214	268	292	268	114	246
Department of Street Cleaning.....	33	35	40	4	2	3	23	361
Department of Water Supply, Gas and Electricity....	11	....	27	4	33	10	33	120
Queens Borough Public Library.....	....	....	....	....	....	....	....	185
Fire Department.....	115	78	240	414	403	461	706	450
Miscellaneous.....	24	....	29	....	....	....	....	409
Police Department.....	7	23	32	132	216	487	160	48
President, Borough of Brooklyn.....	1,153	35	216	822	2,082	1,921	1,200	706
President, Borough of Manhattan.....	1,546	368	525	1,862	3,902	2,587	1,255	659
President, Borough of Queens.....	648	77	83	356	1,690	1,295	756	353
President, Borough of Richmond.....	279	95	313	294	455	856	404	305
President, Borough of The Bronx.....	366	127	266	1,356	1,903	1,411	617	403
<b>Total.....</b>	<b>\$5,075</b>	<b>\$1,939</b>	<b>\$4,468</b>	<b>\$7,935</b>	<b>\$14,423</b>	<b>\$13,680</b>	<b>\$9,488</b>	<b>\$8,896</b>

Sources: New York City, Comptroller's Annual Reports, Statement R 1.

\* Figures are for warrants paid. Cost of land has been excluded throughout. Figures are not given separately for 1919 and 1920 in the Comptroller's Reports but are included in Corporate Stock Fund Accounts for these two years. The total volume of tax notes issued in 1919 amounted to \$2,050,000, and in 1920 to \$4,250,000.

TABLE 9. — EXPENDITURES ON PUBLIC CONSTRUCTION FINANCED OUT OF SPECIAL ACCOUNTS  
IN NEW YORK CITY, 1919-1928\*

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Construction and reconstruction										
Construction of library building, City College.....	..	..	..	..	..	..	..	..	\$115	\$102
Department of Docks — recon- struction.....	..	..	..	..	..	..	..	..	..	140
<sup>53</sup> Restoring and repaving streets										
President, Borough of Brooklyn...	\$326	\$637	\$485	\$465	\$461	\$587	\$577	\$493	570	517
President, Borough of Manhattan...	297	406	561	622	610	735	680	703	753	605
President, Borough of Queens.....	29	48	55	68	84	113	275	331	317	380
President, Borough of Richmond..	25	41	37	55	65	65	62	67	79	97
President, Borough of The Bronx..	44	86	59	107	118	115	129	131	131	144
Total restoring and repaving streets.....	721	1,218	1,197	1,317	1,338	1,615	1,723	1,725	1,850	1,743
Grand Total.....	\$721	\$1,218	\$1,197	\$1,317	\$1,338	\$1,615	\$1,723	\$1,725	\$1,965	\$1,985

Source: New York City, Comptroller's Annual Reports, Statement 8.

\* Figures are for warrants paid. Cost of land has been excluded throughout.

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tration of the voucher or the warrant and the payment of the warrant is naturally very short. The difference between voucher action and warrant action is explained as follows: "All bills presented to the city must be accompanied by a voucher from the department concerned certifying to the acceptance of the supplies or services performed. This voucher is immediately charged against the proper appropriation or other account. The Finance Department, however, must investigate or inspect the services represented by the voucher and satisfy itself as to the correctness of the bill. It has the power to reduce the amount if it deems it excessive. Having determined the amount which it will pay, the Department then prepares a warrant permitting the money to be drawn from the city treasury. The warrant must be signed by the Comptroller and the Mayor or his chief clerk. The check, which is part of the warrant, must be signed by the Chamberlain."<sup>14</sup>

**The City's Debt.**—The growth of the debt of New York since 1830, and the purposes for which it was incurred, have already been described.<sup>15</sup> The phases through which the development of permanent improvements passed are clear and well-defined. From 1835 to 1842 the rise in the debt was chiefly due to the Croton water supply; from 1860 to 1865, to the extraordinary outlays resulting from the war. In the period of Boss Tweed, from 1869 to 1874, the debt was piled high. Borrowings for public buildings and school and bridge construction increased in the seventies. Between 1893 and 1914 a new water supply system and the growing requirements of transit facilities were the principal sources of rising expenditures and increased indebtedness; and in the past decade subway construction, school buildings, street and sewer construction were responsible for the bulk of public expenditures.

Long-term borrowings, which fell substantially during the war, run after 1923 at the rate of more than \$100,000,000 a year. The total of bonds issued and of the issue of tax notes annually from 1910 to 1929 is shown in Table 10. Tax notes, at the outset designed to constitute a new method of pay-as-you-go financing, in the form of short-term obligations for financing public improvements, have failed to take the place of long-term borrowing. Table 11 gives the purpose of the new debt contracted yearly.

**Tax and Debt Limits.**—In the financing of permanent improvements and, indeed, the normal functions of government,

<sup>14</sup> *Lehman*, pp. 9-10.

<sup>15</sup> Chapter I, pp. 8-10, 13.

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state, city and county governments are usually restricted by constitutional provisions in their power to raise taxes and to incur debts. The Constitution of New York State (Article VIII, Section

TABLE 10. — BONDS AND TAX NOTES ISSUED ON ACCOUNT OF EXPENDITURES FOR PERMANENT IMPROVEMENTS BY NEW YORK CITY, 1910-1929

(In thousands)

Year	BONDS ISSUED *			TAX NOTES ISSUED	TOTAL LONG-TERM BONDS AND ONE YEAR TAX NOTES ISSUED
	Non-exempt †	Exempt ‡	Total		
1910.....	\$40,580	\$22,463	\$63,023	....	\$63,023
1911.....	39,288	22,504	61,790	....	61,790
1912.....	48,351	20,050	68,401	....	68,401
1913.....	38,678	24,300	62,978	....	62,978
1914.....	59,270	21,425	80,695	....	80,695
1915.....	57,759	15,300	73,059	\$361	73,420
1916.....	50,745	6,650	57,395	538	57,933
1917.....	58,013	6,000	64,013	4,600	68,613
1918.....	2,327	....	2,327	3,000	5,327
1919.....	7,710	....	7,710	2,050	9,760
1920.....	6,324	....	6,324	4,250	10,574
1921.....	108,618	....	108,618	5,000	113,618
1922.....	28,264	20,000	48,264	2,500 †	50,764
1923.....	11,000	....	11,000	3,700	14,700
1924.....	110,372	26,135	136,507	7,000	143,507
1925.....	109,233	....	109,233	18,500 ‡	127,733
1926.....	85,218	23,870	109,088	16,500	125,588
1927.....	161,743	10,770	172,513	10,500	183,013
1928.....	158,285	11,715	170,000	10,500	180,500
1929.....	171,731	10,369	182,100	12,000	194,100

Sources: New York City, Comptroller's Annual Reports, Schedule B.

\* Includes Corporate Stock, Serial Bonds and Assessment Bonds.

† Obtained by deducting figures of Exempt Bonds Issued from Total Bonds Issued.

‡ Water-supply Bonds.

§ Exclusive of \$600,000 taken up during 1922 from proceeds of renewal bonds of similar amount.

• Exclusive of \$13,113,000 taken up during 1925 from proceeds of renewal notes of similar amount

10) limits the rate of taxes which may be levied for city and county purposes, exclusive of interest and amortization charges on the funded debt, to 2 per cent of the assessed valuation of real and

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personal property subject to taxation for county and state purposes. The same section of the Constitution fixes the limit of the net debt of counties and cities in the State of New York, with certain important and quite considerable exceptions in the case of New York City, at 10 per cent of the assessed valuation of real property subject to taxation. No county or city, therefore, is allowed to become indebted to an amount which, including existing

**TABLE 11. — PURPOSE OF NEW DEBT CONTRACTED YEARLY  
BY NEW YORK CITY, 1925-1929**  
(In thousands)

	1925	1926	1927	1928	1929
January 1st each year—outstanding debt . . .	\$1,459,589	\$1,565,854	\$1,660,994	\$1,761,819	\$1,853,548
Add: new debt added during each year . . . .	126,033	126,933	132,118	134,796	169,254
<b>Total . . . . .</b>	<b>1,585,622</b>	<b>1,692,787</b>	<b>1,793,112</b>	<b>1,896,615</b>	<b>2,027,802</b>
Less: redemptions of debt during each year . . .	19,769	31,793	31,292	33,068	58,909
<b>December 31st each year—outstanding debt . . .</b>	<b>\$1,565,853</b>	<b>\$1,660,994</b>	<b>\$1,761,819</b>	<b>\$1,853,548</b>	<b>\$1,968,893</b>
Yearly percentages of increase of debt . . . . .	. . . .	6.1%	6.1%	5.5%	5.9%
<b>General Purposes of New Debt</b>					
Rapid transit . . . . .	\$20,360	\$51,355	\$64,660	\$61,041	\$99,404
Water supply . . . . .	9,960	7,660	7,970	7,015	11,369
Deck improvements . . . . .	6,925	2,350	17,003	3,132	7,071
School construction . . . . .	41,788	19,199	16,975	25,780	41,610
Various municipal purposes, hospitals, Brooklyn Municipal Building, etc. . . . .	26,950	35,724	18,510	12,828	8,260
Brooklyn-Richmond Tunnel . . . . . (abandoned—work discontinued) . . . . .	50	500	. . . .	. . . .	1,540*
Construction of sewers, highways, etc. . . . .	20,000	10,145	7,000	25,000	. . . .
<b>Total . . . . .</b>	<b>\$126,033</b>	<b>\$126,933</b>	<b>\$132,118</b>	<b>\$134,796</b>	<b>\$169,254</b>
Assessed valuation of taxable real estate . . .	\$11,901,349	\$12,997,581	\$14,539,838	\$15,845,506	\$17,133,817
Yearly percentages of increase of taxable real estate . . . . .	. . . .	9.211%	11.866%	8.980%	8.130%

Source: New York City, Department of Finance, *Bureau of Accounting*.  
\* Awarded by Supreme Court for acquisition of land.

indebtedness, exceeds 10 per cent of the assessed valuation of the real estate of the county or city subject to taxation. To this Article, however, there are certain general exceptions. Debts incurred for these purposes are outside of the debt limit in all cities of the state. Such are certificates of indebtedness or revenue bonds issued in anticipation of the collection of taxes; likewise debts contracted to provide for water supply facilities.



**The Debt Limit of New York City.**—In computing the debt incurring power of the city within the debt limit, the following deductions from its gross indebtedness are to be made:

1. Bonds issued by the city to be redeemed out of the tax levy for the next year succeeding the year of their issue, provided that the amount of such bonds which may be issued in any one year in excess of the debt limitation does not exceed one-tenth of one per cent of the assessed valuation of the real estate of the city subject to taxation.

2. Sinking Fund accumulations, since the indebtedness referred to by the constitutional amendment is net and not gross indebtedness.

3. The debt of the counties consolidated into New York City, as it existed at the time of the consolidation, which is exempted by an amendment to the Constitution in 1899.

4. Water bonds and water corporate stock notes issued after December 31, 1903, exempted by constitutional amendment of 1905.

5. Certain revenue producing improvements for New York City which, after deduction of all repairs and maintenance, netted a revenue in excess of debt charges, exempted by constitutional amendment of 1909. In effect, this means that some subway and dock bonds were exempted from the debt limit to the extent that they were self-sustaining. This exemption is available only for rapid transit and dock improvements.

6. Debts not exceeding \$300,000,000, incurred by the city after Jan. 1, 1928, for the construction and equipment of subways, exempted by constitutional amendment in November 1927.

After making these deductions there have to be added to the resulting figure the non-funded contract and land liabilities and open market orders. The sum obtained is the total indebtedness within the debt limit, and after this is subtracted from the total debt-incurring power of the city within the debt limit (that is, 10 per cent of the assessed valuation of taxable real estate), the difference is the constitutional debt-incurring power of the city within the debt limit as of a particular date. This debt margin naturally fluctuates from year to year. An increase in assessed valuation increases the margin. On the other hand, it is reduced by the inauguration of new public improvements.

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On frequent occasions the debt limit has proved to be highly embarrassing to the city, and repeated constitutional amendments have been adopted for the purpose of increasing the borrowing powers of the city. These substantial increases, however, have not removed the fear of like difficulties in the future. The city could not have proceeded with its subway construction program had not subway debts to the extent of \$300,000,000 been specifically exempted by the constitutional amendment of November 8, 1927. Thus a city in the position of New York might, in times of emergency, when it is desired to expand public construction, be prevented from increasing capital expenditures by borrowing, in consequence of the nearness of its debt to the debt limit, unless the cumbersome procedure involved in first obtaining an exemption through an amendment to the state constitution be invoked.

Increases in the city debt-incurring power may also come from a rise in the total valuation of taxable property. "There is also available a third method [of expanding the debt limit] which, while it does not make possible a larger outstanding debt at any given moment, does make it possible to borrow a larger aggregate amount in a given period of time, at the cost of increasing current revenues by the same amount. . . . This third method consists of shortening the term of new bonds issued and/or of redeeming [them] before maturity, or merely through the accumulation of larger resources in the sinking funds,"<sup>16</sup> which are deductible from gross income in computing the city's net indebtedness. "By issuing fifty year bonds, the city has frozen its credit so that its program of permanent improvements is seriously menaced. . . . Shorter terms for city bonds would make the borrowed moneys revolve more quickly. The same amount of constitutional debt-incurring capacity would therefore permit the city to perform double the amount of work."<sup>17</sup> A fourth method was employed when, in 1927, the Board of Estimate decided "to attempt to work out the financing of the Tri-Borough Bridge without using public credit through the creation of a Bridge Authority," such as the Port of New York Authority, which would have the power "to issue bonds to be paid from the tolls of the bridges. Inasmuch as most of the city's available credit is being earmarked for its subway program, it is

<sup>16</sup> *Lehman*, p. 216.

<sup>17</sup> *Lehman*, pp. 220-221.

difficult to see how bridges or tunnels or other major improvements can be financed without some such device." <sup>18</sup>

A summary of New York City's outstanding indebtedness and of its additional debt-incurring power on the first of January from 1920 to 1929 is given in Table 12. Here the first column shows total

TABLE 12. — TOTAL INDEBTEDNESS, DEBT INCURRING POWER AND UNRESERVED DEBT MARGIN IN NEW YORK CITY, 1920-1929  
(In thousands)

YEAR <sup>a</sup>	TOTAL INDEBTEDNESS WITHIN DEBT LIMIT	CONSTITUTIONAL DEBT INCURRING POWER	UNRESERVED DEBT MARGIN <sup>b</sup>
1920.....	\$ 772,354	\$70,478	\$21,439
1921.....	799,098	63,514	35,233
1922.....	822,032	175,267	133,643
1923.....	851,818	173,181	128,515
1924.....	911,283	148,323	67,116
1925.....	991,458	123,424	47,011
1926.....	1,088,387	101,748	42,175
1927.....	1,172,614	127,144	101,521
1928.....	1,253,064	200,920	162,410
1929.....	1,269,969	314,582	266,504 <sup>c</sup>

SOURCE: New York City, Comptroller's Annual Reports.

<sup>a</sup> Figures as of January 1st.

<sup>b</sup> These figures were obtained by deducting the total indebtedness within the debt limit (gross funded debt minus debt excluded from limit, in accordance with the state constitution) from an amount equal to 10% of the assessed valuation of the taxable real estate of New York City. The result constitutes the debt incurring power; whatever part of this amount was not specifically authorized by the Board of Estimate and Apportionment is represented by the unreserved margin.

<sup>c</sup> In addition to this amount there is a still unencumbered balance of \$198,887,000, out of a \$300,000,000 credit, without the constitutional debt limit, which may be used by the city "for the construction or equipment, or both, of new rapid transit railroads."

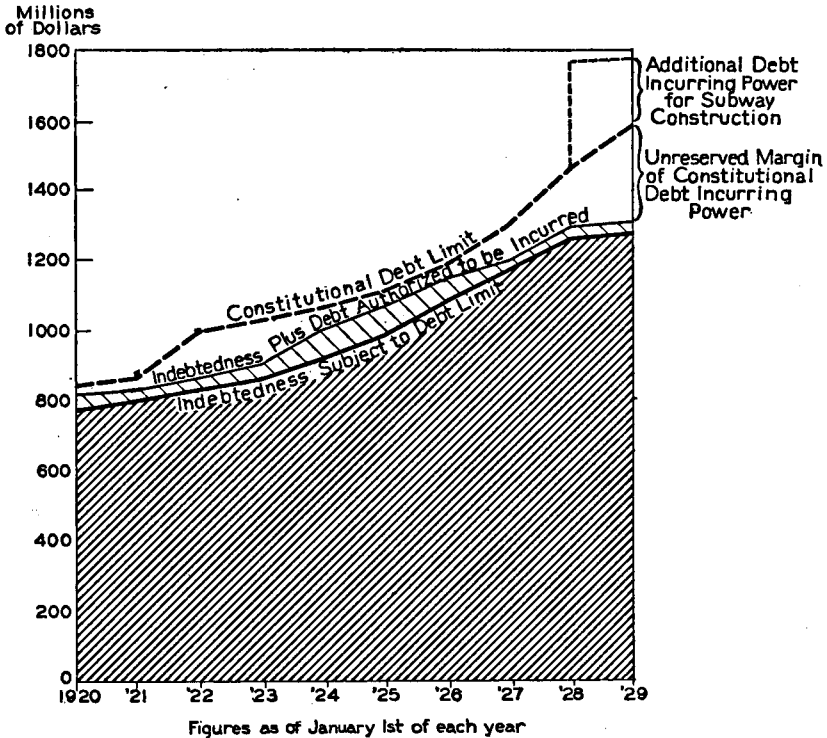
indebtedness within the debt limit, the second the debt-incurring power, and the third that portion of the debt-incurring power still not earmarked by the Board of Estimate. As is pointed out in the note to this table, it does not include an unencumbered balance of \$198,887,000, out of a \$300,000,000 credit, exempted from the

<sup>18</sup> *Lehman*, p. 221. The construction of the Holland Tunnel was a project financed by New York State in conjunction with New Jersey, which entailed no financial obligations upon the city. In the case of similar city projects, however (such as the Tri-Borough bridge), a question arises whether the obligations of such a creature of the city would not be an indirect obligation of the city and be a charge to the city debt limit.

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debt-limit provision, for the construction and equipment of rapid transit facilities.

CHART 5.—TOTAL INDEBEDNESS, DEBT INCURRING POWER, AND UNRESERVED DEBT MARGIN IN NEW YORK CITY, 1920-1929.



The other cities of New York State have frequently found constitutional debt limitations embarrassing. The position of a selected group of these cities in the years 1925 to 1927 is described in Table 13.

**The Purchase of Supplies and Equipment.**—It is impossible from the available sources to prepare a satisfactory account either of the types of supplies and of equipment, in physical units, annually purchased by the departments of New York City, or of even the total amount spent for these items. "The budget of New York

TABLE 13. — TOTAL BONDED AND TEMPORARY INDEBTEDNESS AND CONSTITUTIONAL MARGIN OF DEBT INCURRING CAPACITY IN SELECTED CITIES IN NEW YORK STATE, 1925-1927

(In thousands)

YEAR	TOTAL BONDED INDEBTEDNESS	TOTAL TEMPORARY INDEBTEDNESS	CONSTITUTIONAL MARGIN OF DEBT INCURRING CAPACITY
<b>BUFFALO</b>			
1925.....	\$68,409	\$1,994	\$28,820
1926.....	74,696	2,027	42,376
1927.....	82,296	6,278	39,069
<b>ROCHESTER</b>			
1925.....	45,815	6,524	5,444
1926.....	50,387	6,416	10,743
1927.....	53,712	7,750	10,959
<b>SYRACUSE</b>			
1925.....	23,495	900	3,147
1926.....	28,100	400	9,118
1927.....	32,362	500	5,324
<b>YONKERS</b>			
1925.....	20,329	4,042	3,423
1926.....	25,927	....	4,646
1927.....	21,584	6,990	11,315
<b>ALBANY</b>			
1925.....	16,558	750	2,677
1926.....	18,482	....	4,408
1927.....	20,796	1,625	5,199
<b>UTICA</b>			
1925.....	6,904	120	6,178
1926.....	8,696	170	4,403
1927.....	9,288	250	4,088

SOURCE: New York State, *Annual Reports of the State Tax Commission*.

City is not designed to show accurately and precisely how much is spent annually for supplies, materials and equipment. Appropriations are made to each spending agency for 'supplies, equipment and materials,' but this does not tell the whole story. A separate budget allotment termed 'contract or open order service' is made to each department for repairs, alterations, replacements, and

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new construction projects, and includes labor as well as commodities. Supplementary appropriations which are made throughout the year by the Board of Estimate and Apportionment still further complicate the situation. For this reason, it is exceedingly difficult to secure definite figures on the total spent by each using agency, or by the entire city government for supplies, materials and equipment.

"The largest buyers in the city government are the Department of Education, the Department of Public Welfare and the Department of Street Cleaning. These spent, during 1926 respectively nearly \$6,000,000, over \$3,000,000, and over \$2,000,000. These figures include not only the amount appropriated for supplies, materials and equipment, but also approximately that proportion of the appropriation for contracts or open order service which was spent for commodities." <sup>19</sup>

**Purchasing Agencies in New York City.**—"Since the establishment of the Department of Purchase, it is commonly believed that the city government has a centralized purchasing agency. Such is by no means the case. . . . The Department of Purchase is not a real purchasing agency; nor does its limited jurisdiction extend to all the city and county agencies within Greater New York. Some of these agencies purchase independently; others share that responsibility with the Department of Purchase. The main purchasing agencies now are the Department of Purchase, the Borough President's office, in each of the five boroughs, the Board of City Record, and the Bureau of Supplies of the Department of Education." <sup>20</sup>

The Department of Purchase was established by Chapter 890 of the Laws of 1923. The department has jurisdiction over the purchasing procedure and practices of all the Mayor's departments, except the Department of Education. Its authority extends therefore only to the Mayor's departments. The city and county courts, the supreme courts, the public libraries, the Board of Water Supply, the Board of Transportation and the Transit Commission purchase independently by virtue of special statutes or charter provisions. Several semi-public agencies, such as museums, buy through the Department of Purchase when the expenditures come from city funds but independently if the expenditures are derived from their private funds.

<sup>19</sup> *Lehman*, p. 104.

<sup>20</sup> *Lehman*, p. 106.

During 1926 the following volume of purchases was made through the Department: contracts \$12,707,000; informal awards \$408,000; open market \$2,358,000; making a total of \$15,473,000.

"The supplies purchased by the Borough Presidents' offices are in the main for street paving and repair, sewer construction and maintenance, motor equipment and repairs, fuel supplies, and [in Queens and Richmond] supplies necessary for street-cleaning activities. All stationery and printed supplies used by the Borough Presidents' offices are secured through the Board of City Record."<sup>21</sup>

The Board of City Record is given power to purchase and distribute all printing and stationery supplies, in addition to publishing the *City Record*, the city's official daily newspaper. But the following agencies of the city buy their printing and stationery supplies independently: The Department of Education, the Board of Elections, City College, Hunter College, the Board of Transportation, the Transit Commission, the Board of Water Supply, the supreme courts, museums and libraries. The budget appropriations to the Board of City Record were as follows for 1927: for the city, over \$1,300,000; for the counties, over \$1,400,000.

The Bureau of Supplies of the Department of Education buys all books, supplies, fuel, scientific apparatus and equipment for the school system of the city with the exception of furniture installments, replacements and repairs which are furnished through the Bureau of Construction and Maintenance. Hunter College and City College also buy their supplies independently. During 1925 the total expenditures of the Bureau of Supplies amounted to \$5,741,000. In addition the school system spent \$3,357,000 for furniture and equipment through the Board of Construction and Maintenance.

"The Department of Purchase cannot anticipate requirements and thereby take advantage of favorable market conditions, because it has no contact with store records and no account of stocks on hand in individual departments. In all cases the Department of Purchase, before proceeding to buy, must wait until requisitions are received. . . . The Borough Presidents' offices, generally speaking, buy nothing until requisitions are received, and make no attempt to profit by favorable market conditions."<sup>22</sup>

The Lehman Committee on Plan and Survey of New York

<sup>21</sup> *Lehman*, pp. 107-108.

<sup>22</sup> *Lehman*, p. 113.

TABLE 14. — TAX BUDGET APPROPRIATIONS OUT OF CURRENT REVENUE, FOR PUBLIC WORKS AND FOR SUPPLIES, EQUIPMENT AND MATERIALS, IN NEW YORK CITY, 1919-1929

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Streets, highways and bridges, care and maintenance (personal service) . . . . .	\$5,154	\$6,244	"	\$6,645	\$7,348	\$7,339	\$8,253	\$8,955	\$10,094	\$11,273	\$9,644
Repaving and maintenance; resurfacing of streets and avenues (contracts) . . . . .	...	...	"	...	...	...	...	...	7,000	7,000	8,500
Public buildings and offices; care and maintenance (personal service) . . . . .	398	488	"	480	506	526	572	627	687	743	764
Public buildings and offices; care and maintenance (contracts) . . . . .	...	...	"	1,043	1,267	1,510	1,743	2,075	2,725	3,079	3,184
<sup>44</sup> Construction and equipment of new municipal airport . . . . .	...	...	"	...	...	...	...	...	...	...	2,500
Protection of life and property (contracts)	4,049	4,152	"	3,235	3,372	3,746	4,015	4,332	4,621	5,018	5,596
Consumable supplies											
Educational (schools, colleges and libraries) . . . . .	2,649	3,883	"	4,447	4,920	5,224	4,719	4,959	4,985	5,438	5,371
Health and sanitation . . . . .	2,768	2,933	"	2,526	2,519	2,543	2,624	2,830	3,231	3,312	5,642
Protection of person and property . . . . .	643	671	"	804	984	855	1,030	983	1,074	1,108	973
Correctional purposes . . . . .	794	783	"	628	636	584	551	648	690	691	728
Public welfare (charitable purposes) . . . . .	2,417	2,779	"	2,293	2,222	2,399	2,318	2,492	2,739	2,732	416
Care and maintenance of streets . . . . .	803	844	"	317	344	348	315	377	424	455	454
Operation and maintenance of docks and ferries . . . . .	24 <sup>b</sup>	38 <sup>b</sup>	"	897	1,063	1,002	915	986	1,097	1,402	1,443
Other purposes . . . . .	1,350	1,681	"	1,254	1,782	1,832	1,647	1,652	1,746	1,834	1,768
Total of consumable supplies . . . . .	\$11,448	\$13,612	"	\$13,166	\$14,470	\$14,787	\$14,119	\$14,927	\$15,986	\$16,972	\$16,793



FOR SUPPLIES, EQUIPMENT AND MATERIALS, IN NEW YORK CITY, 1919-1929—Continued

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
<b>Equipment</b>											
Educational (schools, colleges and libraries).....	\$ 624	\$496	*	\$1,241	\$1,781	\$1,688	\$1,587	\$1,648	\$1,683	\$1,951	\$2,134
Health and sanitation.....	487	675	*	596	603	641	1,213	1,304	1,498	2,008	1,465
Protection of person and property.....	248	630	*	382	1,006	881	1,320	959	1,132	1,004	1,021
Correctional purposes.....	174	197	*	108	126	120	164	166	175	175	183
Public welfare (charitable purposes).....	367	404	*	413	417	432	397	436	489	469	64
Care and maintenance of streets.....	114	263	*	140	232	205	330	402	462	415	457
Operation and maintenance of docks and ferries.....	2 <sup>b</sup>	5 <sup>b</sup>	*	51	88	135	97	129	139	210	191
Other purposes.....	164	383	*	259	393	406	452	537	576	562	545
<b>Total of equipment.....</b>	<b>\$2,178</b>	<b>\$3,053</b>	<b>*</b>	<b>\$3,190</b>	<b>\$4,646</b>	<b>\$4,508</b>	<b>\$5,560</b>	<b>\$5,581</b>	<b>\$6,152</b>	<b>\$6,794</b>	<b>\$6,080</b>
<b>Materials, repairs and replacements</b>											
Educational (schools, colleges and libraries).....	1,003	2,454	*	3,447	3,441	3,365	3,292	2,848	2,680	2,716	3,253
Health and sanitation.....	583	932	*	1,311	1,287	1,331	1,566	1,740	1,891	2,030	2,332
Protection of person and property.....	354	594	*	837	935	957	1,570	1,113	1,197	1,261	1,127
Correctional purposes.....	119	202	*	168	156	123	117	125	145	159	159
Public welfare (charitable purposes).....	192	780	*	428	482	400	389	339	455	467	58
Care and maintenance of streets.....	1,351	1,908	*	1,096	952	986	1,132	1,179	1,246	1,452	1,431
Operation and maintenance of docks and ferries.....	139 <sup>b</sup>	190 <sup>b</sup>	*	392	479	641	540	533	651	689	651
Other purposes.....	365	992	*	818	848	938	965	1,006	1,151	1,339	1,406
<b>Total of materials, repairs, etc.....</b>	<b>\$4,106</b>	<b>\$8,052</b>	<b>*</b>	<b>\$8,497</b>	<b>\$8,580</b>	<b>\$8,741</b>	<b>\$9,571</b>	<b>\$8,883</b>	<b>\$9,416</b>	<b>\$10,113</b>	<b>\$10,417</b>

Sources: New York City, Department of Finance, Bureau of Accountancy: Table of Budget Appropriations, published by Board of Estimate and Apportionment in Annual Budgets.

\* Figures are not available for 1921 because of a change in the form of the budget of that year.

<sup>b</sup> Figures are for docks only.

City's Finances made the following recommendations in its report with regard to purchasing methods:

"The Department of Purchasing should be given the power to make purchases under favorable market conditions in anticipation of subsequent needs of the several departments. For this purpose, a revolving fund should be created by tax appropriation. When supplies which have been purchased out of this fund are issued to any department the funds would be reimbursed out of that department's appropriation for such supplies. It might indeed be desirable to make all appropriations for supplies and standard equipment subject to disbursement by the Department of Purchasing rather than the consuming units. The purchase of supplies and equipment for the offices of the Borough Presidents and for the county governments should unquestionably be given to the Department of Purchasing." <sup>23</sup>

Such summary as can be made of the annual purchase of supplies and equipment by New York City is presented in Table 14 in the form of annual appropriations. Because of the difficulty of collecting actual expenditures, the statistics of annual appropriations are probably the best available index of the amounts spent out of tax receipts on repairs, maintenance, supplies and equipment. The Comptroller's office believes that budget appropriations and actual expenditures correspond very closely and advises using appropriations as a satisfactory measure of expenditures.

Strictly speaking, none of these appropriations are for new construction. All such work in New York City is financed by bond issues. In addition a large amount of repair and maintenance work is also financed out of bond issues. In New York City the volume of public works financed by tax receipts out of current income is a very small fraction of the total and almost negligible in comparison with construction financed through long-term indebtedness. The figures in Table 14, then, do not include all expenditures of this sort, made by New York City. Above all, expenditures on materials, supplies and equipment for construction work financed by bond issues—the predominant part of such expenditures—do not appear in this table at all. In other words, the figures do not show the amounts which the departments expended from other than tax budget funds.

<sup>23</sup> *Lehman*, p. XXXII.

**Future Projects.**—It is difficult, in the absence of a detailed future program of public works, to estimate with precision the annual expenditures on public construction during each of the next five years. Vast projects of infinite variety are constantly being planned and their costs estimated, but it is not clear where they fall into the schedule of appropriations and expenditures. In view, however, of the pressing needs for such permanent improvements as subways, tunnels, bridges, other forms of improved transit facilities, school buildings, water supply and sewage systems, it would do no violence to the facts to predict a rising level of expenditures during the coming years, particularly since many of the very large projects are either already under way or are about to begin. The further, also, that proposed permanent improvements are projected into the future, the vaster the total of these undertakings appears to become.

A survey of the estimated cost of projects, scheduled for completion during the fifteen years following 1927, would place the probable annual expenditures around \$200,000,000, or something like \$50,000,000 a year in excess of the expenditures of the past several years. The following items in this program,<sup>24</sup> however, do not include port and harbor trunk-line railroad improvements, highway and park improvements, and educational buildings.

New York City rapid transit.....	\$1,087,000,000
Suburban rapid transit.....	645,000,000
Bridges .....	510,000,000
Additional water supply.....	483,000,000
Incinerator plants, New York City.....	3,000,000
Sewage interceptors and treatment plants, New York City (assuming $\frac{2}{3}$ of estimated cost required by 1940).....	81,000,000
Highway traffic improvements.....	130,000,000
Land for parks and parkways.....	40,000,000
<b>Total.....</b>	<b>\$2,979,000,000</b>

The following more detailed conspectus, made by the General Contractors' Association of New York,<sup>25</sup> while it is subject to revision as to specific projects and cannot be reduced to any time schedule, shows likewise an expanding budget for the city's perma-

<sup>24</sup> *Regional Survey of New York and Its Environs*, Volume II, p. 295.

<sup>25</sup> *The Bulletin of the General Contractors' Association*, New York City, Volume XX, No. 8, August, 1929.

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ment improvements:

Subways under contract or authorized <sup>a</sup> .....	\$600,000,000
New subway system recently announced <sup>b</sup> .....	600,000,000
Delaware River water supply.....	300,000,000
Elimination of New York Central Railroad Tracks.....	175,000,000
Thirty-eighth Street Vehicular Tunnel.....	86,000,000
Narrows Vehicular Tunnel.....	78,000,000
New School Buildings.....	46,150,000
City Water Tunnel No. 2.....	42,692,000
Tri-Borough Bridge.....	25,000,000
West Side Elevated Express Highway.....	20,000,000
Ward's Island Sewerage Plant.....	20,000,000
Improvements connected with West Side Plan.....	11,995,000
Kings County Court House.....	10,000,000
Riker's Island Penitentiary.....	9,000,000
Bronx County Building and Jail.....	8,000,000
New Hunter College Building.....	6,000,000
Fire and Police Houses, Traffic Lights.....	6,000,000
Bellevue Psychopathic Pavilion.....	5,000,000
Kings County Hospital.....	5,000,000
New Wing, Metropolitan Museum.....	3,000,000
Barren Island Air Port.....	2,500,000
Brooklyn Central Library Wing <sup>c</sup> .....	1,000,000
New Wing, American Museum.....	1,000,000
Women's House of Detention.....	1,000,000
<b>Total.....</b>	<b>\$2,062,337,000</b>

<sup>a</sup> \$200,000,000 of this amount still remains to be spent.

<sup>b</sup> Includes equipment.

<sup>c</sup> This figure is not correct, and is estimated to be closer to \$8,000,000.

The plans of several individual administrative departments may furnish a more useful view of the magnitude of the future permanent improvements of New York City than can be got from a general list of undertakings extending far into the future. As in the past decades, the heaviest contemplated expenditures are for various forms of transit facilities. Unless the present congestion of the transportation facilities of the city is ameliorated by other means, the pressure for further construction of subways, bridges, tunnels and manifold highway improvements is bound to continue unabated during the predictable future.

Expenditures on subway construction in the years 1927 and 1928 were in round numbers \$63,000,000 and \$59,000,000. The program for recent subway construction began with a report to the Transit Commission in 1921. The first step for carrying out this program was taken in 1924-1925 with a plan for constructing 55 miles of route. Starting with the last six months of 1924, the total payments, exclusive of land, on vouchers approved and passed by

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the Board of Transportation for all the city's subway systems were as follows:

1924 (six months).....	\$ 3,411,505
1925 .....	19,614,353
1926 .....	52,500,978
1927 .....	63,259,410
1928 .....	58,833,880
1929* .....	78,185,132
<b>Total</b> <sup>b</sup> .....	<b>\$275,805,258</b>

\* The figure for 1929 is preliminary. As in previous years, the 1929 figure represents vouchers approved and passed by the Board, for contracts 3 and 4, and for the Independent System through September 30; but from October through December, 1929, the figure for the Independent System includes vouchers certified by the Chief Engineer, a small amount of which may not be included in vouchers approved by the Board.

<sup>b</sup> It will be observed that the figures in this tabulation represent vouchers approved and passed by the Board and are not exactly equivalent to annual expenditures since there is a time lag between the issue of vouchers and expenditures by the city.

The second stage of recent rapid transit development is represented in future projects involving an estimated cost, exclusive of equipment and recapture, of \$436,800,000. These projects provide for subways from the lower tip of Manhattan to the upper districts of the Bronx and Sheepshead Bay, Rockaway Peninsula and several distant localities in Queens.

The table below is a summary of the mileage and estimated cost of this proposed system, without indicating the period in which the expenditures will be made.<sup>26</sup>

Borough	Route Miles	Track Miles	Estimated Cost
Bronx.....	19.04	51.32	\$ 78,000,000
Brooklyn.....	16.84	61.52	114,500,000
Manhattan.....	11.87	45.48	126,800,000
Queens.....	52.37	136.49	117,100,000
<b>Total</b> .....	<b>100.12</b>	<b>294.81</b>	<b>\$436,400,000</b>

Another source of vast public expenditures in a growing city arises out of the provision for adequate water supply. These expenditures have historically passed through phases of great expan-

<sup>26</sup> Release of the Board of Transportation, New York, September, 1929.

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sion and contraction as old supplies of water were exhausted and new ones had to be tapped. The record of the course of construction since 1906 is shown in Table 15.

**TABLE 15. — VALUE OF CONTRACTS AWARDED AND WORK DONE BY NEW YORK CITY BOARD OF WATER SUPPLY, 1906-1923**

YEAR	VALUE OF CONTRACTS AWARDED *	NUMBER OF CONTRACTS OPERATIVE	VALUE OF WORK DONE UNDER OPERATIVE CONTRACTS
1906.....	\$79,775	1	\$22,984
1907.....	16,912,086	5	228,133
1908.....	9,746,104	12	1,877,790
1909.....	38,233,463	39	7,713,423
1910.....	6,031,795	43	15,600,268
1911.....	22,250,129	54	19,104,290
1912.....	1,359,345	62	19,459,970
1913.....	2,471,850	58	15,053,256
1914.....	2,668,106	51	11,026,495
1915.....	727,194	47	4,309,893
1916.....	675,767	39	1,816,068
1917.....	12,906,304	43	815,007
1918.....	37,477	26	602,054
1919.....	7,034,427	15	1,300,993
1920.....	383,630	8	1,375,705
1921.....	6,282,523	11	4,545,769
1922.....	115,640	8	7,958,751
1923.....	5,457,866	13	10,884,181
1924.....	1,244,518	15	5,061,581
1925.....	3,598,062	12	2,818,278
1926.....	.....	6	1,522,292
1927.....	776,331	8	648,946
1928.....	42,752,851	13	205,545
<b>Total.....</b>	<b>\$181,745,243</b>	<b>..</b>	<b>\$133,951,672</b>

Source: New York City, Board of Water Supply, *Annual Report*, 1928, Report of the Chief Engineer, p. 59.  
 \* Includes additional amounts certified to be expended on contracts awarded during previous years

The Board of Water Supply now has outstanding contracts amounting to over \$40,000,000, for the construction of a water supply delivery tunnel. In addition, the first steps have been

taken in a new program for the construction of additional sources of water supply for the city, known as the Delaware River Supply Plan. It is estimated that the cost of this plan during the next twelve years will be about \$273,000,000, to be expended roughly according to the following schedule.<sup>27</sup>

	Annual Cost	Cumulative Cost
1st year	\$ 3,000,000	\$ 3,000,000
2nd year	10,000,000	13,000,000
3rd year	20,000,000	33,000,000
4th year	40,000,000	73,000,000
5th year	45,000,000	118,000,000
6th year	45,000,000	163,000,000
7th year	40,000,000	203,000,000
8th year	25,000,000	228,000,000
9th year	15,000,000	243,000,000
10th year	15,000,000	258,000,000
11th year	10,000,000	268,000,000
12th year	5,000,000	273,000,000

Any time schedule for huge projects of this nature is naturally subject to revision as a result of many fortuitous circumstances. It is estimated, however, that of the four contracts for the delivery tunnel awarded on October 5, 1928, aggregating \$42,692,567 and known as contracts Nos. 224, 225, 226 and 227, the first will be completed in 67 months from October 15, 1928, the second in 68, the third in 70, and the fourth in 69 months.

In their present form, neither the general estimates of New York City's future projects, nor the more detailed plans of the Board of Transportation and of the Board of Water Supply can be used to forecast the probable annual expenditures on permanent improvements in each of the next five years. All of the data, however, do indicate an expanding program of public works during the next decade, and probably beyond that. It is a fair inference, then, that the existence of a detailed program of public works and of a more centralized authority for its execution, would allow a greater measure of control, either by way of retardation or acceleration, than appears feasible under existing conditions.

<sup>27</sup> New York City, Board of Water Supply, *Annual Report*, 1928, Appendix 1, p. 83.

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The Numbers Directly Employed on Public Works.—Much of public construction in this country is usually done not directly by a public agency but by private contractors. The payroll records of these contractors are rarely available and it is, consequently, almost impossible to procure an adequate picture of the numbers employed directly on public construction in the United States, except by methods of estimate. A count of the number so employed in New York City during the autumn of 1929 was attempted and the results of this census are shown in Table 16.

TABLE 16. — ESTIMATED NUMBER OF EMPLOYEES ON PUBLIC WORKS IN NEW YORK CITY, FALL OF 1929

DEPARTMENT	ESTIMATED NUMBER EMPLOYED		
	On Payroll	Under Contract	Total
Armory Board . . . . .	0	100	100
Bronx, President of Borough of . . . . .	1,250	950	2,200
Brooklyn, President of Borough of . . . . .	1,700	1,600	3,300
Corrections, Department of . . . . .	30	100	130
Docks, Department of, Bureau of Engineering . . . . .	450	200	650
Education, Department of . . . . .	500	3,000	3,500
Estimate and Apportionment, Board of . . . . .	15	25	40
Fire Department . . . . .	0	200	200
Higher Education (C. C. N. Y. and Hunter) . . . . .	0	150	150
Hospitals, Department of . . . . .	200	300	500
Manhattan, President of Borough of . . . . .	1,500	1,500	3,000
Parks, Department of . . . . .	50	300	350
Plant and Structures, Department of . . . . .	400	400	800
Police Department . . . . .	0	100	100
Queens, President of Borough of . . . . .	2,000	1,800	3,800
Richmond, President of Borough of . . . . .	650	500	1,150
Transit Commission . . . . .	200	0	200
Transportation, Board of . . . . .	2,550	12,700	15,250
Water Supply, Board of . . . . .	150	1,400	1,550
Water Supply, Gas and Electricity, Department of . . . . .	1,200	700	1,900
<b>Total . . . . .</b>	<b>12,845</b>	<b>26,025</b>	<b>38,870</b>

Source: New York City Civil List and estimates of departments.

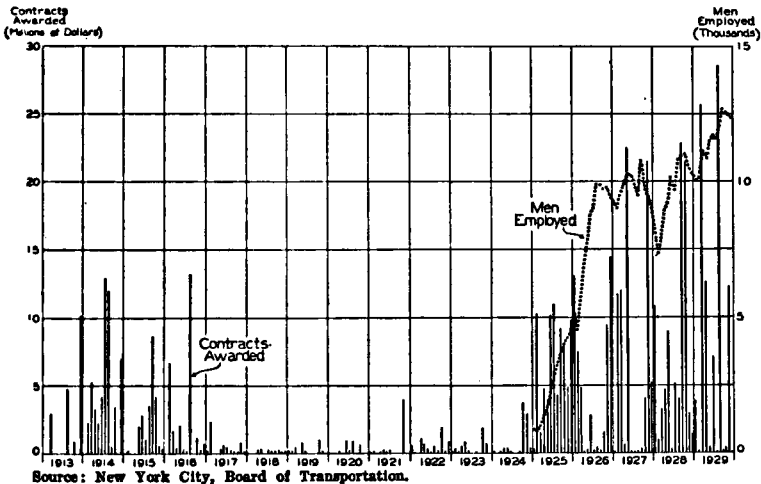
It is probable that the total of 38,870 is a considerable underestimate. Competent students estimate the number to be closer to 50,000. Contracts for public works awarded in New York City in 1928 amounted to \$225,000,000. If the total value of output of an



employee be placed at \$4,500, the numbers employed on these contracts would be about 50,000. A conservative estimate of the average number so employed in 1929, would, therefore, be about 40,000.

**The Total Numbers Employed by New York City.**—It should be of interest in this connection to obtain some estimate of the

**CHART 6.—MONTHLY CONTRACTS AWARDED FOR SUBWAY CONSTRUCTION IN NEW YORK CITY, 1913-1929 AND AVERAGE NUMBERS OF MEN EMPLOYED THEREON, 1925-1929.**



total number of persons employed by New York City in the administration of the normal functions of government,<sup>28</sup> on public works, and in the operation of the transit system of the city. The results of such an estimate are given in the following tabulation, which presents the average condition in 1929:

Officials and employees of New York City . . . . .	131,667
Officials and employees in transit operations . . . . .	41,108 *
Directly employed on public works . . . . .	40,000
<b>Total . . . . .</b>	<b>212,775</b>

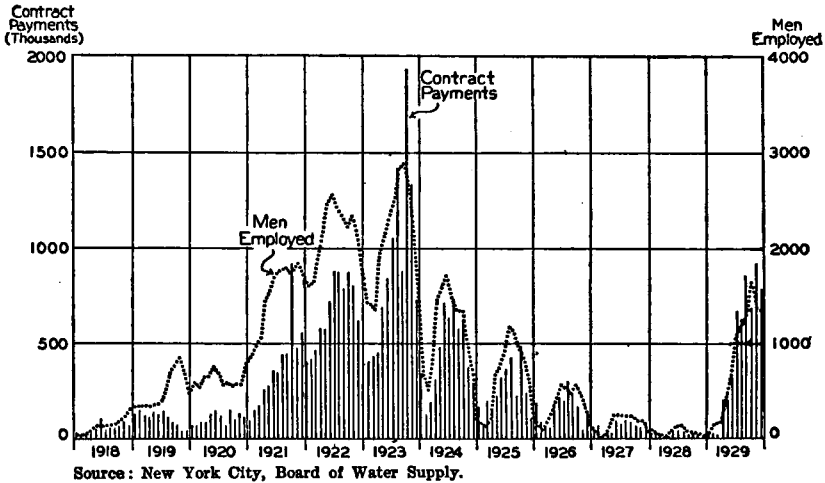
\* This figure is for 1928.

<sup>28</sup> For the details of this category, see Appendix D.

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**Control.**—There is hardly any tangible evidence of the exercise of control over public works by the administrative agencies of New York City. It is clear, however, that any comprehensive program of planning and control would involve radical changes in municipal organization and procedure. Much would depend also, as will be seen later, on the type of control which it is desired to employ. Acceleration of permanent improvements over short

**CHART 7.—CONTRACT PAYMENTS FOR CONSTRUCTION OF WATER SUPPLY SYSTEMS IN NEW YORK CITY AND AVERAGE NUMBERS OF MEN EMPLOYED THEREON, MONTHLY, 1918-1929.**



periods only, would impose emergency burdens on city departments that might easily be borne. The creation of reserves of public works, on the other hand, might run into greater difficulties. In general it is not easy to see how any control whatsoever can be exercised intelligently without provision somewhere in the city government for long-range planning and budgeting. Aside from these considerations, there will always be continuing obstacles to perfect control. Financial features of municipal public works operations, such as debt and tax limits, have already been mentioned and will be discussed at greater length later. In connection with a financial program, the Lehman Committee on the finances of New York City reported that "if it is possible, it is desirable that a city should prepare a financial program covering five or ten

years. Such a program should set forth the expenditures that would be necessary year by year by reason of the normal growth of the city's activities. The program would disclose the expenditures for permanent improvements which are contemplated and would indicate the method by which all expenditures would be financed. Few cities have ever prepared such a comprehensive program. The difficulties involved are great. . . . Such planning enables a city to decide more intelligently upon the projects that it will undertake than when the sifting of capital demands is left to a series of special sessions of appropriating authorities. A comprehensive plan will undoubtedly insure greater economies. It will keep steadily before the city officials the fact that a particular program will require at given dates tax levies which are known in advance."<sup>29</sup> But New York City, like many other American municipalities, is still far from depending on such far-sighted programs.

In the planning and execution of large-scale projects, more and longer steps are required than is normally realized.<sup>30</sup> Assuming that all legal obstacles are overcome, the building of a comprehensive water supply system involves procedure that cannot be avoided. Thus the New York City Delaware River Plan involves, first, the acquisition of the necessary land at the cost usually of lengthy condemnation proceedings. The engineers must then make studies of the locations of the dams, shafts, and tunnels. Contracts awarded to contractors, of whom there will be many, must be drawn up with the most detailed specifications. Each contract runs into hundreds of pages, and work on them cannot begin until the territory of the plan is adequately mapped out and the test borings are completed. The construction on this project will probably be on a three eight-hour shift per day basis.

A more serious difficulty and one not so easily overcome, encountered in this project, will be the removal of legal obstacles. The plan involves the use of the flood waters of the tributaries of the Delaware River. The Delaware River flows through Pennsylvania, New Jersey, and New York. Up to the present time, Pennsylvania and New Jersey have refused their consent to the New

<sup>29</sup> *Lehman*, pp. 74-75.

<sup>30</sup> For a summary of steps required in the development of the Catskill Mountain Water Supply, see brief chronology of this plan, Appendix E.

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York plan. Litigation, still not adjusted, has passed through these stages:

1. The New York State Water Power and Control Commission approved the plan on May 5, 1929.

2. On May 20, 1929, New Jersey filed a bill of complaint against the State of New York and the City of New York, asking the Supreme Court of the United States for an injunction perpetually restraining the defendants from drawing any water from the Delaware River and its tributaries.

3. To this, the City filed an answer on October 7, 1929. On January 20, 1930, the State of New Jersey withdrew its motion for hearing on complaint and answer and withdrew its objections to the appointment of a master to take testimony.

With regard to the plan for grade-crossing elimination and river-front improvement on the west side of New York, a project estimated to cost \$140,000,000, a contract for the undertaking was executed between New York City and the New York Central Railroad on July 5, 1929. Work here was briefly delayed because the railroad company required permission of the Interstate Commerce Commission to relocate its tracks. This permission was granted by the Commission on December 11, 1929, and the final obstacle to the start of work was removed. It is said that, in this case, the Commission acted with unusual rapidity<sup>81</sup> because the Mayor of the City had asked the Commission for a prompt decision.

<sup>81</sup> *New York Times*, December 12, 1929.

## CHAPTER III

### THE GOVERNMENT OF NEW YORK STATE

In contrast to the variety of public works undertaken by American cities, the expenditures by state governments for permanent improvements go largely for the construction of buildings and roads. More than 90 per cent of the annual expenditures for public construction by the state governments of Ohio, Illinois, and California is used in the construction of highways and public buildings. To present a detailed conspectus of the course of permanent improvements financed and administered by one state government will most clearly illustrate the problem; the rest of this chapter is therefore concerned with a comprehensive description of the recent history of the public works programs of the government of the State of New York.

**The Public Works Expenditures of the New York State Government.**—The cost of permanent improvements undertaken by New York State increased from \$25,000,000 in 1919 to \$72,000,000 in 1928, a rate of increase not so rapid as the rise, during the same period, in the expenditures of New York City. Throughout the decade outlays for highways and public buildings have come to represent an increasing portion of the total expenditures of the state government. At the same time expenditures for canals and waterways which in 1919 accounted for more than one-third of the total had fallen by 1928 to a position of much lesser importance. Parks and reservations, on the other hand, involve much larger outlays now than they did at the beginning of the decade.

In the administration and financing of projects of permanent improvement, the government of the State of New York has no simple procedure. Expenditures are made by a variety of administrative agencies, some long established and others created for the purpose, and the funds are of diverse origin. The materials for understanding this condition are contained in Table 18, which gives a detailed statement of expenditures on permanent improvements, classified by administrative agency and by the source of expendi-

TABLE 17. — EXPENDITURES ON PUBLIC CONSTRUCTION BY NEW YORK STATE GOVERNMENT,  
1919-1928\*  
(In thousands)

Class	YEAR ENDING JUNE 30TH									
	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Buildings from tax receipts <sup>b</sup> .....	\$ 3,476	\$4,387	\$6,107	\$5,731	\$4,318	\$6,494	\$5,979	\$6,081	\$5,535	\$6,136
Buildings from bond issues.....	....	....	....	....	....	3	372	3,522	9,460	13,189
Total for buildings.....	\$3,476	\$4,387	\$6,107	\$5,731	\$4,318	\$6,497	\$6,351	\$9,603	\$14,995	\$19,325
Highways and bridges from tax receipts <sup>c</sup> .....	8,945	10,385	12,203	19,085	21,083	26,341	34,524	36,563	31,403	44,771
Highways and bridges from bond issues.....	2,114	3,978	5,117	6,686	3,939	2,659	1,342	716	428	448
Total for highways and bridges.....	\$11,059	\$14,363	\$17,320	\$25,771	\$25,022	\$29,000	\$35,866	\$37,279	\$31,831	\$45,219
Canals and waterways — maintenance and repairs.....	2,144	2,879	3,670	3,093	3,794	4,129	3,405	3,092	3,204	2,291
Canals and waterways — barge canal construction.....	7,633	3,716	2,778	3,532	2,161	1,641	2,670	905	492	179
Total for canals and waterways.....	\$9,777	\$6,595	\$6,448	\$6,625	\$5,955	\$5,770	\$6,075	\$3,997	\$3,696	\$2,470
Public Works Department — miscellaneous outlays from general fund.....	79	56	68	59	25	54	1,742	2,515	33	707
Parks and reservations, etc. from tax receipts.....	175	122	462	230	136	569	273	151	283	495
Parks and reservations, etc. from bond issues.....	....	....	....	....	....	....	....	77	1,103	1,568
Total for parks and reservations.....	\$175	\$122	\$462	\$230	\$136	\$569	\$273	\$228	\$1,386	\$2,063
Holland Tunnel — from tax receipts.....	\$2	\$107	\$299	\$468	\$4,030	\$5,923	\$4,774	\$3,942	\$3,844	\$1,496
Grade crossing eliminations — from tax receipts.....	68	135	99	134	56	315	70	302	....	....
Grade crossing eliminations — from bond issues.....	....	....	....	....	....	....	....	....	38	385
Total for grade crossing eliminations.....	\$68	\$135	\$99	\$134	\$56	\$315	\$70	\$302	\$38	\$385
Grand Total (excluding canal maintenance and repairs).....	\$22,492	\$22,886	\$27,133	\$35,925	\$35,748	\$43,999	\$51,746	\$54,774	\$52,619	\$69,374
(including canal maintenance and repairs).....	\$24,636	\$25,765	\$30,803	\$39,018	\$39,542	\$48,128	\$55,151	\$57,866	\$55,823	\$71,665

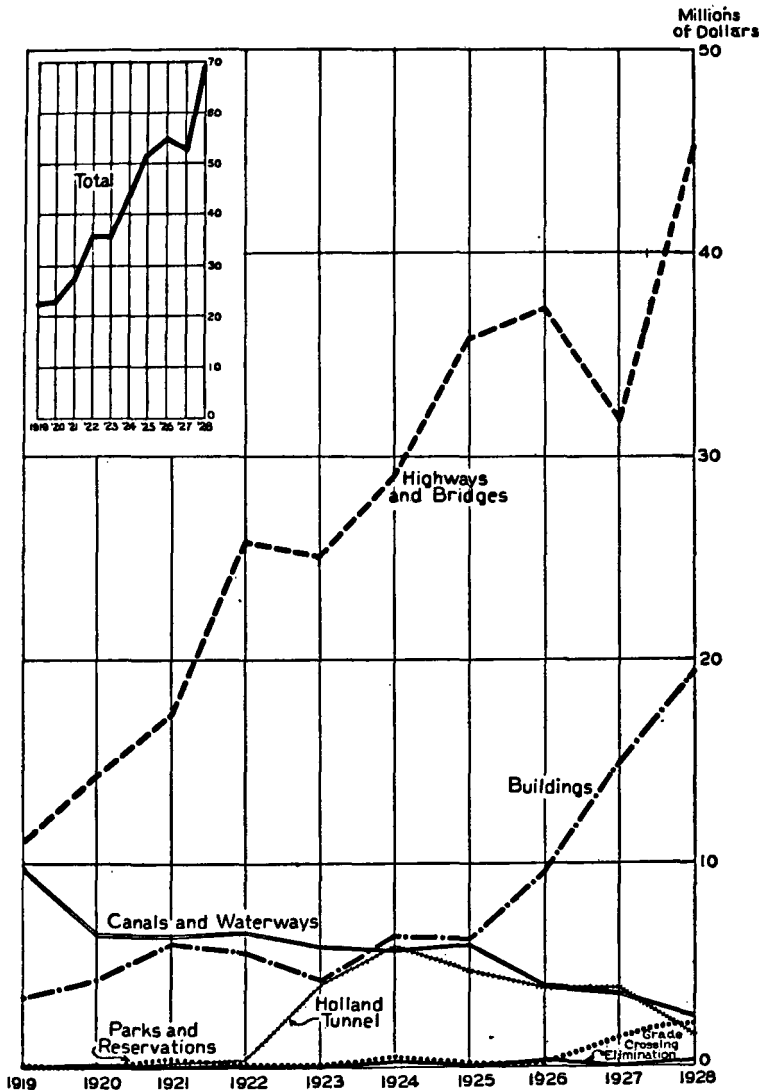
Source: New York State, Comptroller's Annual Reports.

\* All the figures omit expenditures for land. For composition of figures in each class, see Appendix F.

<sup>b</sup> Includes prisons, hospitals, educational buildings, offices, etc.

<sup>c</sup> Inclusive of federal aid to states and state aid to counties and towns.

**CHART 8.—EXPENDITURES ON PUBLIC CONSTRUCTION BY NEW YORK STATE GOVERNMENT, 1919-1928.**



ture. The construction of both Tables 17 and 18, involving problems of reclassifying public accounts and the making of arbitrary decisions to include or exclude items requires further comments.

Throughout the tables here used, the cost of land has been excluded. Where it is an important item, the yearly expenditure for its acquisition by the given department has been calculated separately and is given in footnotes to Table 18. The cost of "maintenance and operation" has also been excluded. In most cases, as with schools, hospitals, prisons, etc., this item is very difficult to calculate correctly, but is relatively unimportant. In the Department of Public Works, however (especially in the Division of Highways) maintenance is an important expenditure which has been included along with repairs. In every other instance, where "maintenance" does not mean "operation" it means "repairs." The figures for repairs are also included in the tables. They are not given separately, however, because the expenditures on repairs are so small as to be of slight comparative importance—a few thousand dollars each year in each case, a few hundred thousand in the aggregate. To give these figures separately would also be misleading because only minor repairs carried out by regular force employees are listed as such. More important repair work, done by contract, is regarded as reconstruction, and is listed as capital outlay on permanent improvements. For the canals, two different figures are given; for new construction and for maintenance and repairs.

Expenditures on construction in all departments, except the Public Works Department, are listed as capital outlays. In the Public Works Department construction expenditures are distributed between personal service, fixed charges, and capital outlays. The outlays on permanent improvements of the Public Works Department have been separated into two classes, those made by the Highway Division, and all others made by the Department. The former are for the construction of highways and roads of one sort or another (largely rural post roads), the latter comprehend miscellaneous expenditures for public works (largely on bridges and waterways).

Expenditures for barge canal construction have come out of the Special Canal Fund over the entire period; that is, this work has been financed largely by means of bond issues. Expenditures for canal maintenance and operation until 1927 came out of the Gen-



TABLE 18. — EXPENDITURES ON PUBLIC CONSTRUCTION BY NEW YORK STATE GOVERNMENT, 1919-1928  
FROM THE GENERAL FUND\*

(In thousands)

DEPARTMENT <sup>b</sup>	YEAR ENDING JUNE 30TH									
	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Executive <sup>c</sup> .....	.....	.....	.....	.....	.....	.....	.....	.....	\$ 166	\$ 167
Conservation (Protective) <sup>d</sup> .....	\$175	\$122	\$462	\$230	\$136	\$569	\$273	\$151	283	495
Correction (Penal) <sup>e</sup> .....	541	731	1,193	1,275	503	297	305	434	531	445
Education (Ed. and Agric.) <sup>f</sup> .....	539	530	436	709	1,172	1,287	491	628	407	315
Health (Regulative) <sup>g</sup> .....	199	78	37	28	6	88	141	23	117	84
Mental Hygiene <sup>h</sup> .....	.....	.....	.....	.....	.....	.....	.....	.....	3,145	2,893
New York Bridge and Tunnel Com- mission (Holland Tunnel).....	2	107	299	468	3,422	5,614	4,774	3,436	3,547	1,496
Port of New York Authority.....	.....	.....	.....	.....	.....	7	52	528	488	1,024
Westchester County Park Com- mission.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30
Lake Champlain Bridge Commission.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	120
Canals, maintenance, etc.....	.....	.....	.....	.....	.....	.....	.....	.....	151	.....
Curative.....	1,284	1,662	3,085	3,009	2,150	3,266	3,260	3,588	i	i
Charitable.....	804	1,198	1,049	458	289	452	924	677	j	j
Defensive.....	109	188	307	252	198	245	198	132	k	k
Grade crossings (various depart- ments).....	68	135	99	134	56	315	70	302	.....	.....

Sources: New York State, Comptroller's *Annual Reports*, Exhibit 17, pp. 70-200.

\* Figures are for capital outlays, excluding cost of land, and repairs.

<sup>b</sup> As a result of the Reorganization Act of 1926 the functions of the various government departments were redistributed. The summary figures for broad classes of expenditure through 1926 are consequently not strictly comparable with the figures for 1927 and 1928. So far as possible the figures in this table for the whole period, 1919-1928, have been reclassified and are here presented in substantially comparable form.

<sup>c</sup> Executive under new classification includes armories and some camps (listed before under head of "Defensive") and some eight institutions, charitable schools, hospitals and homes, under the jurisdiction of the Division of Standards and Purchase. These before 1926 were included in "Charitable."

<sup>d</sup> Parks, reservations, memorials, under the old classification listed as "Protective."

<sup>e</sup> State prisons, reformatories, etc., designated "Penal" before 1927.

<sup>f</sup> Under old classification schools of agriculture, experimental stations, etc., were listed under "Agriculture"; in 1927 included in "Education."

<sup>g</sup> Includes only Division of Laboratories and Institute for Study of Malignant Diseases; before 1927 included under "Regulative."

<sup>h</sup> Includes 16 hospitals for the insane and 6 institutions for mental defectives. Before 1927 these were listed largely in "Curative" and partly in "Charitable."

<sup>i</sup> In 1927 and 1928 no longer a separate department; included under "Mental Hygiene."

<sup>j</sup> In 1927 and 1928 distributed between "Executive" and "Mental Hygiene."

<sup>k</sup> In 1927 and 1928 included under "Executive."

TABLE 18. — EXPENDITURES ON PUBLIC CONSTRUCTION BY NEW YORK STATE GOVERNMENT, 1919-1928  
 FROM THE GENERAL FUND<sup>a</sup>—Continued  
 (In thousands)

DEPARTMENT OF PUBLIC WORKS	YEAR ENDING JUNE 30TH									
	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Personal service										
Administration.....	.....	.....	.....	.....	.....	.....	\$161	\$274	\$321	\$399
Division of Canals and Waterways.....	.....	.....	.....	.....	.....	.....	"	"	1,233	1,444
Division of Highways.....	.....	.....	.....	.....	.....	.....	132	529	525	436
Division of Public Buildings, maintenance and repairs, etc.....	.....	.....	.....	.....	.....	\$859	499	325	841	1,811
Maintenance of state and county highways, general.....	\$5,836	\$6,866	\$6,923	\$5,535	\$7,350	10,800	13,550	15,443	7,380	8,071
Maintenance of state and county highways, special.....	572	657	339	840	720	665	976	799	1,417	8,798
Miscellaneous repairs, etc.....	39	95	4	29	11	107	49	46	28	257
Fixed charges and contributions										
Construction and improvement of highways, state aid to counties.....	.....	.....	1,451	2,705	2,299	2,385	2,412	2,375	2,380	2,376
Advances for federal rural post roads.....	100	100	213	2,863	3,704	4,384	5,890	4,808	4,755	5,146
Repairs to highways, county roads	20	20	60	30	30	30	30	25	20	20
Repairs to highways, state aid to towns.....	2,147	2,255	2,271	2,443	2,490	2,531	2,637	2,712	2,909	3,048
Outlays on permanent improvements <sup>1</sup> .....	79	56	68	59	25	54	1,742	2,515	33	707
Outlays on permanent improvements <sup>2</sup> .....	153	217	735	4,206	4,395	5,331	8,796	9,298	11,534	16,152
Repairs to highways, Indian Reservation.....	78	38	73	48	46	101	.....	.....	.....	.....
Total expenditures from the General Fund.....	\$12,745	\$15,055	\$19,104	\$25,321	\$29,002	\$39,387	\$47,362	\$49,048	\$42,211	\$55,734

<sup>1</sup> Payment of Department of Public Works, exclusive of highway outlays.

<sup>2</sup> Payment of Bureau of Highways. (Highway Bureau consolidated with Department of Public Works after 1926.)

<sup>3</sup> Paid out of Special Credit Fund, 1926, and other sources.

FROM SPECIAL FUNDS—(CONTINUED)  
(In thousands)

FUND	YEAR ENDING JUNE 30TH									
	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Highway Improvement Fund — construction.....	\$ 2,114	\$3,978	\$5,117	\$6,686	\$3,939	\$2,659	\$1,342	\$ 716	\$428	\$448
Palisades Interstate Park Fund <sup>a</sup> .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State Forest Preserve Fund <sup>a</sup> .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State Institutions Building Fund.....	.....	.....	.....	.....	.....	3	372	2,522	7,925	5,743
General State Improvement Fund <sup>a</sup> .....	.....	.....	.....	.....	.....	.....	.....	.....	1,535	7,446
State Park System Fund <sup>a</sup> .....	.....	.....	.....	.....	.....	.....	.....	77	1,103	1,568
Grade Crossing Elimination Fund.....	.....	.....	.....	.....	.....	.....	.....	.....	38	385
Other funds — construction items.....	.....	.....	.....	.....	.....	.....	.....	.....	7	22
Black River Regulating District <sup>a</sup> .....	.....	.....	.....	.....	.....	202	769	15	4	128
Hudson River Regulating District <sup>a</sup> .....	.....	.....	.....	.....	.....	2	5	2	3	719
Canal Fund — barge canal construction.....	7,633	3,716	2,778	3,532	2,161	1,641	2,670	905	492	179
New York and New Jersey Tunnel Fund.....	.....	.....	.....	.....	608	309	.....	506	297	.....
Barge Canal Fund — maintenance and repairs.....	2,144	2,879	3,670	3,093	3,794	3,925	2,631	3,075	1,813	.....
Federal Rural Post Roads Revolving Fund.....	.....	137	134	386	38	.....	.....	.....	.....	.....
Total expenditures from Special Funds.....	\$11,891	\$10,710	\$11,699	\$13,697	\$10,540	\$8,741	\$7,739	\$8,818	13,645	\$16,638
Grand Total of all expenditures from General and Special Funds.....	\$24,636	\$25,765	\$30,803	\$39,018	\$39,542	\$48,128	\$55,151	\$57,866	\$55,856	\$72,372
<sup>a</sup> Exclusive of acquisition of land, amounting to:.....	\$ 26	\$254	.....	\$ 19	.....	\$ 25	\$45	.....	.....	.....
<sup>b</sup> Exclusive of acquisition of land, amounting to:.....	404	653	\$752	1,071	\$978	1,531	346	\$581	\$483	.....
<sup>c</sup> Exclusive of acquisition of land, amounting to:.....	.....	.....	.....	.....	.....	.....	.....	879	1,438	\$1,426
<sup>d</sup> Exclusive of acquisition of land, amounting to:.....	.....	.....	.....	.....	.....	.....	.....	302	1,189	2,039
<sup>e</sup> Not in State Treasury.										

eral Fund. An appropriation was made annually for this purpose in the budget and the expenditures appear regularly as an item in the General Fund Statements of the Comptroller's *Annual Reports*. The money, however, was immediately transferred to the Special Canal Fund, unexpended balances being returned at the end of the year and figuring as an inter-se transaction in each case. But since the money comes out of the General Fund, it means that canal maintenance and operation (but not new construction) has been financed out of current revenue and from the proceeds of taxation.

By the Reorganization Act of 1926 a new system was introduced. The money for canal maintenance is no longer transferred to the Special Fund, but is expended instead by the Department of Public Works (Division of Canals and Waterways). This explains why no expenditures on canal maintenance in 1928 appear against "Barge Canal Fund Maintenance" and why the figure for 1927 is so much smaller than that for 1926. By 1928 these expenditures are all grouped under the Public Works Department.

All the other special funds (with only very minor exception) are financed out of bond issues exclusively. The Canal Fund has, as just pointed out, also been largely financed in this way for purposes of canal construction. Although the expenditures on maintenance and repairs come immediately out of the Special Canal Fund, they are tabulated with other expenditures financed out of taxes because they are derived from current revenue.

The data in these tables were extracted from the *Annual Reports* of the Comptroller, 1919-1928 and show all the expenditures of New York State, for whatever purpose and however raised. Several exceptional cases, where the money does not come directly or wholly out of the state treasury and which require some explanation are as follows:

1. Hudson River and Black River Regulating Districts.—This is a small item, included in Table 18, of expenditures which, though not out of the state treasury, are given in the Comptroller's reports, and are clearly for public construction.

2. Prison Capital Fund Expenditures.—The figures for the construction and maintenance of state prisons are included in Table 18 under the heading "Department of Correction" (before 1927, "Penal"). The Prison Capital Fund, however, gets its revenue from prison industries, and the expenditures therefrom are not subject to control by the state treasury, and do not figure in the

Comptroller's reports, but come under the jurisdiction of the prison authorities. Occasionally the funds are used for minor construction and repair work; but the figures are so small as not to be worth troubling about, and it is doubtful also whether they can be properly regarded as public expenditures.

3. Interstate Bridge Commission.—This is the authority charged with constructing the Lake Champlain Bridge, a New York-Vermont Interstate project which has just been completed. The Commission had authority to borrow money in the New York money market, the debt to be paid off from the proceeds of the tolls charged for the use of the bridge. The Commission received \$120,000 from the New York State General Fund in 1928.

4. Port of New York Authority.—This is a New York-New Jersey Interstate Commission, empowered to borrow money on its own authority, its bonds to be paid off from the proceeds of the tolls charged for the use of its facilities. The figures for the expenditures of New York State in connection with the Commission, appear yearly in the Comptroller's reports and have been included in the tables. The expenditures of the Port Authority itself, however, since they are strictly speaking, expenditures of neither the New York State nor the New York City government, have been tabulated separately.

5. Highways.—Federal aid for the construction of Federal Rural Post Roads is a regular item in the State's accounts of its expenditures. There are the following four types of road construction:

- a. State Highways for which the state pays the whole cost.
- b. County Highways of which state and county share the cost.
- c. County Roads whose cost is borne by the county alone.
- d. Town Highways whose cost is borne by the state and city.

The shares of the counties and towns in (b) and (d) do not appear in the state accounts or in the tables, though all the work is supervised by the state Department of Public Works. This is the reason why the Highway Division of the Public Works Department has very much larger figures for road construction expenditures in its annual reports than appear for the same item in the Comptroller's reports. The latter exclude money expended by counties and towns, whereas the Public Works Department reports include such expenditures as an indication of the volume of high-

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way work done under state supervision, though they are not expenditures out of the state treasury.

In addition to bearing the entire cost of state highway work, and to sharing the cost of county and town highways with the various county and town authorities of the state, the state government also makes an annual grant for highway work to the counties

**TABLE 19.—TOTAL EXPENDITURES ON PUBLIC CONSTRUCTION  
IN NEW YORK STATE, 1925-1928\***  
(In thousands)

SPENDING AGENCY	1925	1926	1927	1928
<b>State Government</b>				
Including land.....	\$53,990	\$60,644	\$69,559	\$73,583
Excluding land.....	51,746	54,774	52,619	69,374
Excluding land and state aid <sup>b</sup> .....	46,697	48,687	47,330	63,950
<b>All counties, cities, villages and towns, except New York City</b>				
Including land.....	125,958	140,626	156,425	146,374
Excluding land (estimated) <sup>c</sup> .....	118,401	132,188	147,040	137,592
<b>New York City: excluding land.....</b>	<b>132,871</b>	<b>131,394</b>	<b>143,545</b>	<b>132,721</b>
<b>All governmental units, excluding land</b>				
State government <sup>b</sup> .....	46,697	48,687	47,330	63,950
Counties, cities, villages and towns, except New York City.....	118,401	132,188	147,040	137,592
New York City.....	132,871	131,394	143,545	132,721
<b>Total expenditures in entire state, excluding land.....</b>	<b>\$297,969</b>	<b>\$312,269</b>	<b>\$337,915</b>	<b>\$334,263</b>

**SOURCE:** New York State, Comptroller's *Annual Reports* for State Government, and for Municipal Accounts for Counties, Cities, etc.

New York City, Comptroller's *Annual Reports*.

• It is impossible to carry this table back of 1925, as figures for counties, cities, etc., are not given for years prior to 1925 in utilisable form.

<sup>b</sup> State highway aid to counties and towns excluded from State Government expenditures to avoid duplication.

• Cost of land estimated on basis of expenditures for land by State Government.

and towns for their own use. These appear in the tables as "Construction and Improvement of Highways—State Aid to Counties" and "Repairs to Highways—State Aid to Towns." The tables for expenditures of the state government thus include only the expenditures on highways which come out of the state treasury.

**Expenditures in the Area of New York State.**—It is of interest, in comparison with the expenditures on public works of the City

of New York and of the New York State government, to venture an estimate of the expenditures on permanent improvements of all local governments in New York. A summary of such an estimate is given in Table 19, for each year from 1925 to 1928. It shows that while the state government spent on public construction, exclusive of state aid, \$63,950,000 in 1928; New York City, \$132,721,000; the remaining counties, cities, villages and towns expended for these purposes \$137,592,000. Of a total expenditure on public construction by all governments in the State of New York of \$337,915,000 in 1927, probably \$150,000,000 were spent for the construction of streets and highways, and probably \$50,000,000 for school construction, although this last figure apparently includes expenditures for the acquisition of sites.<sup>32</sup>

**The Initiation of Public Works by the New York State Government.**—Making appropriations for the ordinary requirements of government and for permanent improvements is the function of the Governor and of the State Legislature. On or before the fifteenth of October, the head of each department of the state government submits to the Governor itemized estimates of proposed appropriations. The Governor, after hearings have been held, at which the attendance of heads of departments can be required, can revise such estimates. Representatives from the Committees of the Senate and the Assembly are invited to attend the hearings.

On or before the 15th of the following January, the Governor submits to the Legislature the budget containing a plan of proposed expenditures. This annual budget is referred to the Senate Finance and the Assembly Ways and Means Committees for consideration and is subsequently reported with recommendations to the Legislature. These committees also consider all bills introduced in the Legislature carrying appropriations or providing for the expenditures of public money.<sup>33</sup> The Governor may, before the Legislature finally votes upon the budget and not more than thirty days after it has been submitted, amend or supplement it. He may also, with the consent of the Legislature, submit amendments or a supplementary bill at any time before the Legislature adjourns.

The Governor and the departmental heads have the right to appear and be heard in respect to the budget while it is being con-

<sup>32</sup> New York State Tax Commission, *Annual Report*, 1927, Table 36, pp. 584-590.

<sup>33</sup> New York State, *Laws of 1927*, Ch. 131. See also *Legislative Manual*, 1929, p. 641.

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sidered. The Legislature cannot alter an appropriation bill submitted by the Governor except to strike out or reduce items in it, but it may add appropriation items if these are stated separately and distinctly from the original items of the bill and refer to some single object or purpose. When a bill has been passed by both Houses it immediately becomes a law without further action by the Governor.

Neither House can consider further appropriations until the appropriation bills proposed by the Governor have been finally acted upon by both Houses. Further appropriations have to be made by separate bills, each for a single object. The Governor, however, is at liberty to recommend that one or more of his proposed bills should be passed in advance of others to supply the immediate needs of government or to meet an emergency.

**Debt-Incurring Procedure.**—Short term debts may be contracted in anticipation of the receipt of taxes for the purposes and within the amounts of budget appropriations. Long term debts must be authorized by law for a specified piece of work or purpose. Such a law is not effective until it has been submitted to the people and approved by them at a general election. All debts contracted after January 1, 1920, are required to be in the form of serial bonds, with a maximum period of redemption of fifty years.

Long term debts may also be authorized by constitutional amendment.<sup>34</sup> The state debt for the elimination of railroad grade crossings was created by this procedure. The debt, also, for the construction of public buildings and works was authorized by constitutional amendment in November, 1925.

The following tabulation shows the borrowings by the government of New York State for permanent improvements between 1919 and 1928.<sup>35</sup>

Year	Long Term Bonds	Temporary Loans	Total
1919	.....	\$ 600,000	\$ 600,000
1920	.....	2,200,000	2,200,000
1921	\$31,800,000	6,500,000	38,300,000
1922	.....	.....	.....
1923	.....	.....	.....
1924	.....	25,000	25,000
1925	12,500,000	35,000	12,535,000
1926	.....	1,305,000	1,305,000
1927	28,475,000	833,000	29,308,000
1928	22,500,000	3,450,000	25,950,000

<sup>34</sup> New York State Constitution, Article VII, secs. 14 and 15; also Article XIV.

<sup>35</sup> New York State, Comptroller's *Annual Reports*

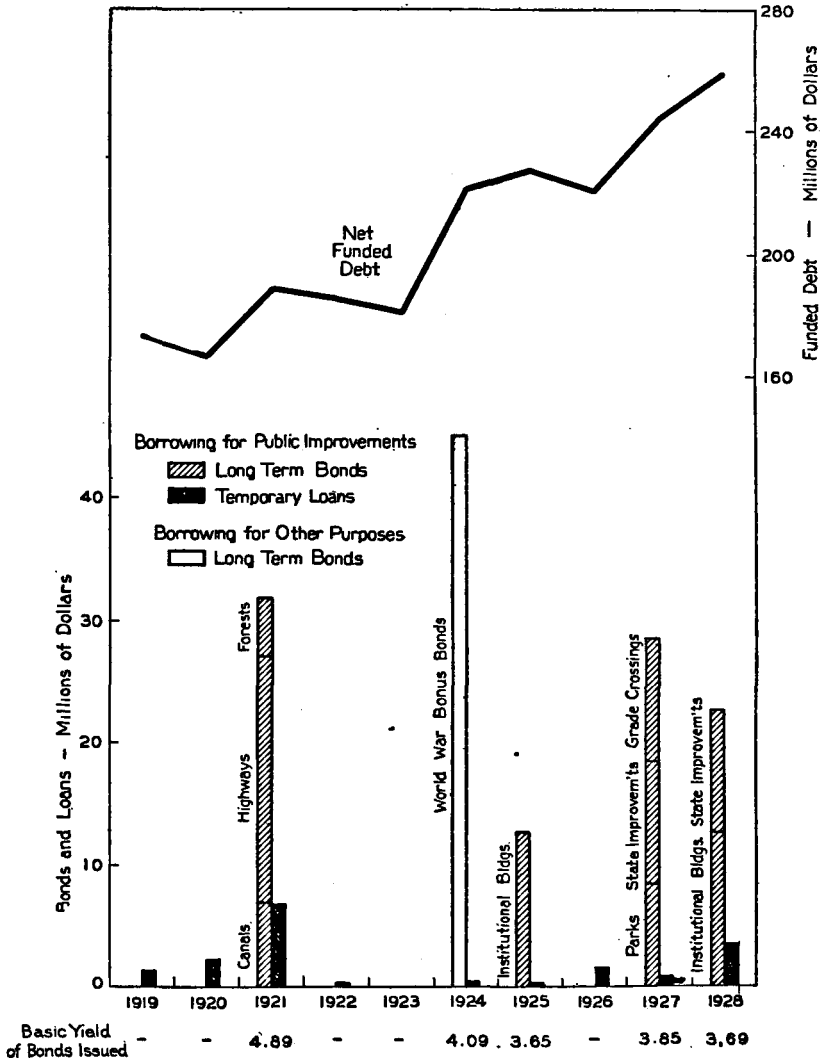


TABLE 20. — LONG TERM BOND ISSUES BY NEW YORK STATE GOVERNMENT, 1921-1928  
GIVING INTEREST RATES AND BASIC YIELDS

Date	Purpose	Interest Rate Per Cent	Term of Years	Amount (In thousands)	Price	Basis Per Cent
June 9, 1921.....	Highways	5	25¼ av.	\$20,000	\$101.212	4.89
June 9, 1921.....	Forest preserves	5	25¼ av.	5,000		
June 9, 1921.....	Barge canal	5	26¼ av.	6,800		
Total fiscal year 1920-21...				\$31,800	\$101.212	4.89
April 8, 1924.....	Soldiers' bonus	4½	1-25 Ser.	45,000	101.4657	4.09
Total fiscal year 1923-24...				\$45,000	\$101.4657	4.09
69 Sept. 24, 1924.....	State institutions and construction	4	1-25 Ser.	12,500	103.41	3.65
Total fiscal year 1924-25...				\$12,500	\$103.41	3.65
Sept. 1, 1926.....	Grade crossings elimination	4	1-50 Ser.	10,000	101.9289	3.85
Sept. 1, 1926.....	General state improvement—land	4	1-50 Ser.	1,650		
Sept. 1, 1926.....	General state improvement—construction	4	1-25 Ser.	8,350		
Sept. 1, 1926.....	State park system—land	4	1-50 Ser.	5,000		
Sept. 1, 1926.....	State park system—development	4	1-25 Ser.	3,475		
Total fiscal year 1926-27...				\$28,475	\$101.9289	3.85
March 6, 1928.....	State institutions—building	3½	1-25 Ser.	12,500	100.0799	3.6921
March 6, 1928.....	General state improvements	4	1-25 Ser.	7,600		
March 6, 1928.....	General state improvements	3¾	1-50 Ser.	2,400		
Total fiscal year 1927-28...				\$22,500	\$100.0799	3.6921

Source: New York State, Comptroller's Annual Reports and Municipal Bond Buyer, 1918-1928.

CHART 9.—ANNUAL ISSUES OF LONG TERM BONDS AND TEMPORARY BORROWING BY NEW YORK STATE, 1919-1928.



Figures for fiscal year ending June 30

Source: New York State Comptroller's Annual Reports and The Bond Buyer, *Municipal Bond Sales*.

Between April 5, 1917, when \$25,000,000 of state bonds were sold, and June 1921, there were no long term state loans because of the unsettled conditions of war and the attempt to restrict borrowing for capital purposes to absolute necessities.<sup>86</sup> The long term bonds issued by the New York State Government, from 1921 to 1928, are listed in Table 20, which describes in detail the amount, the dates of issue, purposes and terms of these borrowings.

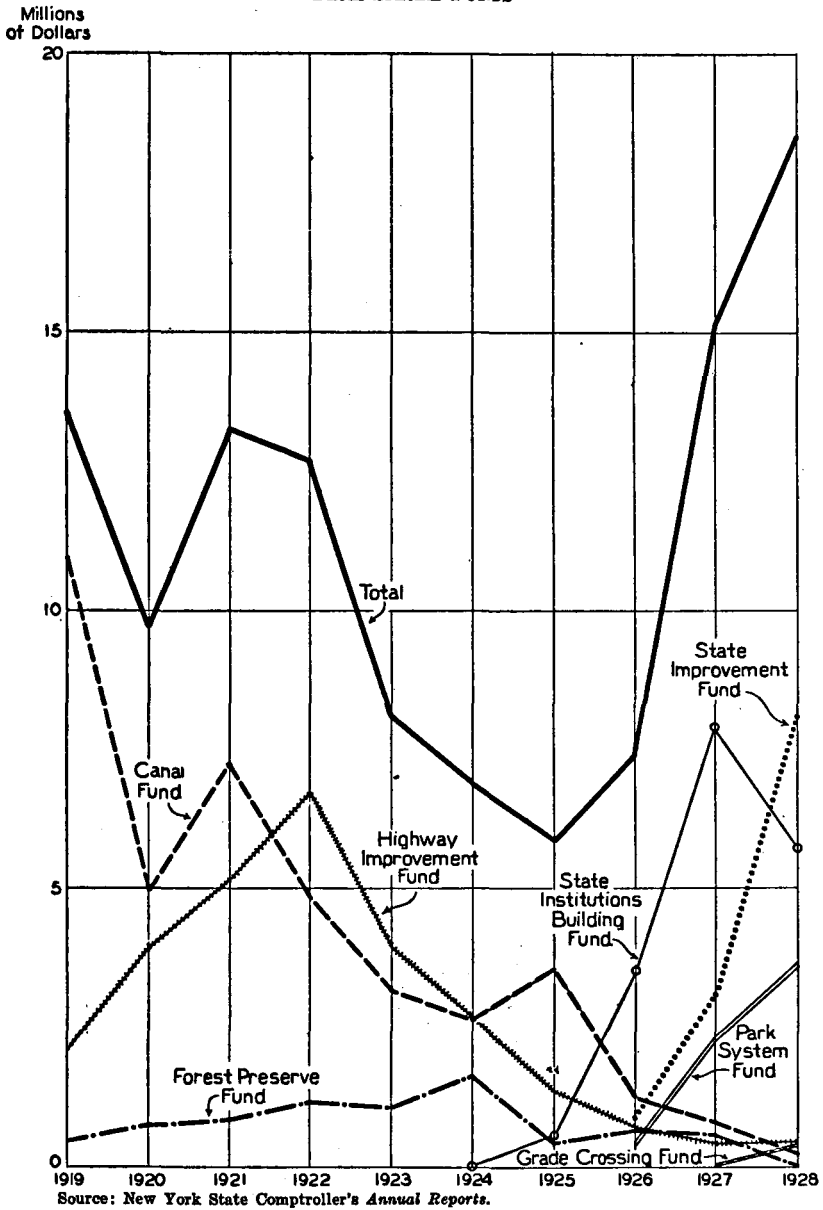
**The Financing of Public Works.**—Permanent improvements are in New York State financed out of the General Fund, that is from tax receipts, and out of Special Funds, which are mainly bond issues. Recourse to these two sources of expenditure has shifted considerably during the history of the public works undertakings of the government of the State of New York. In 1926 it was possible to write that "since 1916 there has been a very marked change in the percentage of permanent improvements financed from bonds and from current revenues. In 1916, over 89 per cent of the money going into improvements came from borrowed funds. In 1925 this had shrunk to 8.1 per cent, though the total amount spent had risen from sixteen to over thirty millions of dollars. The current revenue devoted to permanent improvements has suddenly jumped from a few million dollars to an average of over twenty million dollars for the last four years [1922-1925]. This represents some 15 per cent of the general fund expenditures for these years. This is a remarkable fiscal achievement and indicates the capacity of New York [State] to pay for improvements from current revenues."<sup>87</sup>

It is seen, however, in Table 21 that since 1925 there has again been a striking shift in the financing of public works from bonds and from current revenue. The percentage financed by borrowing rose sharply from 8 per cent in 1925 to 40.5 per cent in 1928 and the increase of more than 50 per cent in total expenditures between 1925 and 1928 was met largely out of the proceeds of bond issues. This has been due to the adoption of a new financial policy by the state government, carrying with it the creation of special bond funds for the elimination of grade crossings, buildings, and other state improvements.

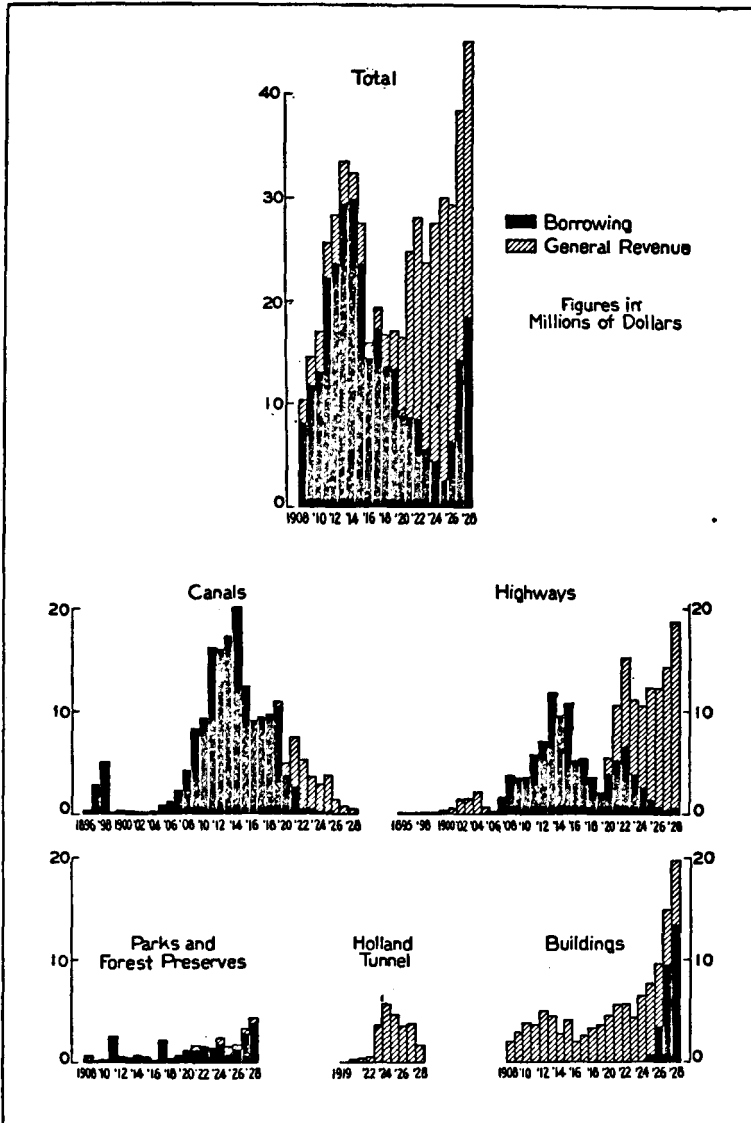
<sup>86</sup> New York State, *Comptroller's Annual Report*, 1920, p. XIV.

<sup>87</sup> New York State *Legislative Document*, 1926, No. 70; Report of Special Joint Committee on Taxation and Retrenchment, *The Debt of the State of New York*, pp. 79, 81.

CHART 10.—EXPENDITURES ON PUBLIC CONSTRUCTION BY NEW YORK STATE GOVERNMENT, 1919-1928  
FROM SPECIAL FUNDS



**CHART 11.—EXPENDITURES ON DIFFERENT TYPES OF PUBLIC CONSTRUCTION BY NEW YORK STATE GOVERNMENT FROM GENERAL REVENUE AND FROM BORROWING.**



Source: New York State Comptroller's Annual Reports.

TABLE 21. — TOTAL EXPENDITURES ON PERMANENT IMPROVEMENTS  
BY NEW YORK STATE GOVERNMENT, 1908-1928 \*

(In thousands)

FISCAL YEAR	TOTAL EXPEN- DITURES FROM THE GENERAL FUND <sup>b</sup>	EXPENDITURES FOR PERMANENT IMPROVEMENTS				TOTAL DEBT SERVICE		
		FINANCED FROM CURRENT REVENUE		FINANCED FROM BORROWING		TOTAL AMOUNT	PER CENT OF TOTAL EXPEN- DITURES (Col. 2)	
		Amount	Per cent of Col. 2	Amount	Per cent of Col. 7			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1908	\$34,279	\$2,220	6.5	\$8,108	78.5	\$10,328	\$5,675	16.6
1909	39,138	2,786	7.1	11,875	81.0	14,661	6,275	16.0
1910	38,235	3,845	10.1	13,061	77.3	16,906	2,097	5.5
1911	38,035	3,611	9.5	22,091	85.9	25,702	2,655	7.0
1912	44,702	4,878	10.9	23,327	82.7	28,205	4,157	9.3
1913	49,836	4,419	8.9	29,274	86.9	33,694	6,789	13.6
1914	53,563	2,686	5.0	29,792	91.7	32,478	9,669	18.1
1915	57,034	3,952	6.9	23,557	85.6	27,510	7,681	13.5
1916	52,497	1,720	3.3	14,267	89.2	15,987	9,589	18.3
1917	60,881	2,263	3.7	17,105	88.3	19,368	10,548	17.3
1918	73,143	3,212	4.4	13,587	80.9	16,799	13,168	18.0
1919	78,341	3,865	4.9	13,212	77.4	17,077	13,330	17.0
1920	93,924	7,717	8.2	8,732	53.1	16,449	13,592	14.5
1921	135,608	16,196	11.9	8,671	34.9	24,866	15,585	11.5
1922	126,669	19,450	15.4	8,488	30.4	27,939	10,441	8.2
1923	131,869	18,036	13.7	5,549	23.5	23,585	12,079	9.2
1924	146,457	23,066	15.8	4,396	16.0	27,462	11,679	8.0
1925	161,587	27,663	17.1	2,422	8.1	30,084	15,150	9.4
1926	173,192	23,312	13.5	6,144	20.9	29,456	15,759	9.1
1927	184,184	24,130	13.1	14,310	37.2	38,440	15,243	8.3
1928	212,626	26,915	12.7	18,302	40.5	45,217	17,379	8.2

SOURCE: New York State, Legislative Document 1926, No. 70, *The Debt of the State of New York*, p. 80, for years up to 1925. Figures for 1926-1928 calculated directly from Comptroller's Annual Reports.

\* Expenditures on the acquisition of land have been included throughout. The figures for total expenditures on permanent improvements in this table do not agree with the totals in the detailed tables for expenditures on public construction. The figures here are for new construction alone, and do not include expenditures for maintenance, repairs or reconstruction; nor for operation or administration; nor state aid to localities and federal aid to state. The composition of these figures, however, is consistent throughout the table, thus making the relative percentage accounts financed by tax receipts and borrowing from year to year strictly comparable.

<sup>b</sup> Figures in this column are for total expenditures of all kinds except capital expenditures financed from borrowing.

1. The Elimination of Railroad Grade Crossings.—In 1925 the people of New York State voted to amend the Constitution by approving in a referendum a state bond issue of \$300,000,000, for the purpose of eliminating dangerous crossings. This bond issue was authorized to meet the state share and to provide for loans to the railroads and the local communities to cover their share of the cost of the work.

By the Grade Crossings Elimination Act (Chap. 233, *Laws of 1926*, April 5, 1926) all crossings at grade, outside of the cities of New York, Syracuse and Buffalo, come under the jurisdiction of the state Public Service Commission. The City of Syracuse has its own grade crossing commission and the City of Buffalo its grade crossing and terminal commission. In New York City such work falls within the jurisdiction of the Transit Commission (not to be confused with the Board of Transportation). Although the elimination of grade crossings in these three cities lies outside the jurisdiction of the Public Service Commission of New York State, the work is financed out of the bond issue of \$300,000,000.

Operations were begun by the Commission in June, 1926. It soon developed, however, that many of the local communities whose assessed valuations were low, were unable to finance their portion of the cost. In 1927, therefore, a second amendment to the Constitution was passed (Chap. 445, *Laws of 1927*) whereby the city or county instead of the local community was, with the state and the railroads to share in the cost of elimination. The Constitution, at that time, provided that the railroads should pay 50 per cent, the state, 25 per cent and the local community, 25 per cent. In order to lighten the burden of the county or city, the new constitutional amendment while leaving the railroads' share at 50 per cent, allowed the Legislature to increase the state's share and lower that of the county or city. Under this provision, in 1928, the share of the state was increased to 40 per cent and the share of the city or county reduced to 10 per cent. Even this apportionment left too heavy a burden on the local governments, so that in 1929, the law was once more amended<sup>88</sup> and the respective shares of the state, the county and the railroads were fixed at 49, 1, and 50 per cent of the cost of elimination.<sup>89</sup>

<sup>88</sup> New York State, *Laws of 1929*, Ch. 645.

<sup>89</sup> New York State, *The Highway Law, 1929*, p. 385.

TABLE 22.—EXPENDITURES FOR HIGHWAY CONSTRUCTION  
BY NEW YORK STATE GOVERNMENT, 1895-1928\*

(In thousands)

Year	Total Expenditures (Cols. 3 & 4)	Expenditures from Bonds for State Highways	Total Expenditures from General Revenues (Cols. 5 & 6)	Expenditures from Revenues for State Highways	State Aid to Counties from General Revenues	Percentage of Total Highway Expenditures Provided from General Revenues <sup>b</sup>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1895	\$5	....	\$5	\$5	....	100.0
1896	8	....	8	8	....	100.0
1897	12	....	12	12	....	100.0
1898	53	....	53	3	\$50	100.0
1899	85	....	85	....	85	100.0
1900	316	....	316	112	204	100.0
1901	658	....	658	171	487	100.0
1902	1,362	....	1,362	465	897	100.0
1903	1,578	....	1,578	702	876	100.0
1904	2,150	....	2,150	648	1,502	100.0
1905	891	....	891	891	....	100.0
1906	220	....	220	220	....	100.0
1907	1,704	\$1,704	....	....	....	0.0
1908	3,859	3,859	....	....	....	0.0
1909	3,565	3,565	....	....	....	0.0
1910	3,703	3,649	53	53	....	1.4
1911	5,904	5,897	7	7	....	0.1
1912	7,110	7,105	5	5	....	0.1
1913	11,885	11,808	77	77	....	0.6
1914	9,465	9,439	26	26	....	0.3
1915	10,861	10,841	20	20	....	0.2
1916	5,173	5,173	....	....	....	0.0
1917	5,530	5,507	23	23	....	0.4
1918	3,784	3,758	26	26	....	0.7
1919	2,267	2,114	153	153	....	6.7
1920	5,710	3,978	1,732	1,732	....	30.3
1921	10,500	5,132	5,368	3,917	1,451	51.1
1922	15,318	6,710	8,608	5,903	2,705	56.2
1923	11,192	3,939	7,253	4,953	2,300	64.8
1924	10,563	2,659	7,904	5,509	2,395	74.8
1925	12,590	1,343	11,247	8,862	2,385	89.3
1926	12,389	716	11,673	9,298	2,375	94.2
1927	14,342	428	13,914	11,534	2,380	97.0
1928	18,976	448	18,528	16,152	2,376	97.6

Source: New York State, Legislative Documents 1928, No. 70, *The Debt of the State of New York*, pp. 70-71, for years 1895-1925; years 1926-1928 calculated directly from Comptroller's Annual Reports.

\* These figures are for new construction only. They do not include expenditures for maintenance, repairs or administration; nor for state aid to towns for repairs, nor federal aid to the state for rural post roads. Composition of these figures up to 1925 not exactly the same as that of figures in Tables 17 and 18. The difference, however, is on the whole so slight as to be negligible.

<sup>b</sup> The percentage represented by expenditures for state highways alone (col. 5) was 37.3 in 1921, 38.5 in 1922, 44.5 in 1923, 52.2 in 1924, 70.4 in 1925, 75.1 in 1926, 80.4 in 1927 and 85.1 in 1928.



Prior to the enactment of the Grade Crossings Elimination Act of 1926, all such work was done under the authority of the existing Railroad Law. Alterations to existing structures which carry the highway over or under a railroad still come under the provisions of this law and the state's share of such alterations must come out of the funds available for highway construction.<sup>40</sup> Before 1926, therefore, the state had no long-time policy for the elimination of grade crossings.

2. The Financing of Highway Construction.—Prior to 1898 the building and maintenance of public roads in New York State was the function of local governments. A large-scale program by the state government began in 1905 with the authorization, by popular vote, of a \$50,000,000 bond issue for highway construction. In 1907 the state adopted a plan for the improvement of 14,000 miles of roads. By 1912, when bond issues were exhausted and no current revenue was available for road building, the project of 1907 was little more than half-completed. In 1912, therefore, the state legislature was empowered again to contract for a further bond issue of \$50,000,000. "Although the two bond issues, totaling \$100,000,000, have furnished the bulk of the funds for highway construction, current revenues are contributing an increasingly important share . . . [and] the present trend indicates that borrowing [for this purpose] will [in the future] be unnecessary."<sup>41</sup>

3. Expenditures for Public Buildings.—The first substantial expenditures on public buildings, derived from borrowings, began in 1925. Before then all buildings erected by the State of New York were paid for without the issue of special bonds. In 1925 "the first bonds were sold for building construction," when "\$12,500,000 was borrowed under the \$50,000,000 authorization of 1923."<sup>42</sup> Thereafter the amounts spent out of borrowings increased until they constituted in 1928 more than two-thirds of the total expenditures.

<sup>40</sup> New York State, Department of Public Works, *Annual Report of the Superintendent*, 1928, pp. 76, 80-81.

<sup>41</sup> New York State, *Legislative Document*, 1926, No. 70, *ibid.*, pp. 69, 72.

<sup>42</sup> New York State, *Legislative Document*, 1926, No. 70, *ibid.*, p. 77; see also Laws of New York State, Ch. 591.

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**TABLE 23. — EXPENDITURES FOR BUILDINGS BY NEW YORK STATE GOVERNMENT, 1908-1928 \***

(In thousands)

YEAR	EXPENDITURES FROM CURRENT REVENUE	EXPENDITURES FROM BONDS	PERCENTAGE EXPENDITURES FROM CURRENT REVENUE
1908.....	\$1,843	....	100.0
1909.....	2,780	....	100.0
1910.....	3,777	....	100.0
1911.....	3,598	....	100.0
1912.....	4,791	....	100.0
1913.....	4,244	....	100.0
1914.....	2,571	....	100.0
1915.....	3,900	....	100.0
1916.....	1,720	....	100.0
1917.....	2,219	....	100.0
1918.....	3,081	....	100.0
1919.....	3,300	....	100.0
1920.....	4,578	....	100.0
1921.....	5,423	....	100.0
1922.....	5,637	....	100.0
1923.....	4,127	....	100.0
1924.....	6,163	\$3	99.95
1925.....	6,912	577	92.3
1926.....	6,081	3,522	63.3
1927.....	5,535	9,460	36.9
1928.....	6,136	13,189	31.8

Source: New York State, Legislative Document 1926, No. 70, p. 77, for years 1908-1925; years 1926-1928 calculated directly from Comptroller's *Annual Reports*.

\* Composition of figures up to 1925 not exactly the same as that of figures in detailed Table 17 but the difference is on the whole so slight as to be negligible. Expenditures on the acquisition of land have been included throughout, except in 1926, 1927 and 1928 when this item has been excluded in both columns, thus making the percentage comparable for all years.

4. Canal and Park Construction.—These declining items in the state budget for permanent improvements have a contrasting history since 1919. Expenditures for the rebuilding of canals are now financed wholly out of current revenue and the cost of parks and forest preserves apparently increasingly out of loans. The sources of expenditures for each purpose are shown in the following tabulation:

**THE GOVERNMENT OF NEW YORK STATE**      **79**

Year	Percentage of Total Expenditures Derived from Current Revenue*	
	Canals	Parks and Forest Preserves
1919	3.6	3.1
1920	25.7	0.5
1921	65.3	23.6
1922	88.2	9.8
1923	84.6	8.9
1924	96.6	28.4
1925	98.9	68.0
1926	100.0	35.8
1927	100.0	10.7
1928	100.0	13.0

\* New York State, *Legislative Document*, 1926, No. 70, pp. 66, 75. The figures for 1926-1928 are obtained directly from the *Comptroller's Annual Reports*.

5. Financing Through Special Agencies.—The device is from time to time used in New York, as well as elsewhere, of placing the financing and construction of revenue-producing public works under the jurisdiction of a quasi-public agency, usually created for the specific purpose. The Port of New York Authority is an important agency of this character. It is an Interstate New York-New Jersey Commission created in 1921 as the agent of these states to conceive and administer plans, approved by the states, for the improvement of terminal facilities, the relief of confusion at shipping centers, and the construction of bridges, tunnels and belt-line railroads. In 1926 the Port Authority was directed by the legislatures of New York and New Jersey to erect two bridges between Staten Island and New Jersey, commonly known as the Arthur Kill Bridges. Later the Port Authority was further directed to build the Kill Van Kull Bridge between Staten Island and Bayonne, New Jersey, and the Hudson River Bridge between Washington Heights and Fort Lee.

In financing these projects, the Port Authority is required to raise funds on its own credit. It is not limited as to the amount of securities it issues, except that it must meet debt charges and administration and maintenance costs out of the earnings of its facilities. The agreement between the two states expressly forbids the Port Authority to pledge the credit of either.

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**Unexhausted Bond Issue Authorizations.**—Bond authorizations are not usually issued immediately after authorization or even within a short period of time. Knowledge, therefore, of the volume of bonds authorized is no index of the probable schedule of expenditures. The condition of authorized bond issues for state institutions and buildings, the state park system, general state im-

TABLE 24. — CONDITION OF UNEXHAUSTED BOND ISSUES AUTHORIZED BY NEW YORK STATE GOVERNMENT AT END OF FISCAL YEAR 1928  
(In thousands)

	STATE INSTITUTIONS BUILDING FUND	STATE PARK SYSTEM FUND	GENERAL STATE IMPROVEMENT FUND	GRADE CROSSINGS ELIMINATION FUND
Date of authorization...	Nov. 6, 1923	Nov. 4, 1924	Nov. 3, 1925	Nov. 3, 1925
Law or constitutional amendment.....	1923 <sup>a</sup> , Ch. 591	1924 <sup>a</sup> , Ch. 622	Art. <sup>b</sup> 7, Sec. 15	Art. <sup>b</sup> 7, Sec. 14
Amount of issue authorized.....	\$50,000	\$15,000	\$100,000	\$300,000
Amount appropriated up to June 30, 1928..	50,000	15,000	20,000	70,000
Total of bonds issued up to June 30, 1928..	25,000	8,475	20,000	10,000
Expenditures from bond funds up to June 30, 1928.....	17,779	6,279	12,057	436
Authorized bonds still unissued on June 30, 1928.....	25,000	6,525	80,000	290,000

SOURCE: New York State, Comptroller's *Annual Reports*, Laws of the State of New York and Constitution of the State of New York.

<sup>a</sup> New York State, *Laws*.

<sup>b</sup> New York State, *Constitutional Amendment*.

provement, and for grade crossings elimination, shown in Table 24, indicates the considerable lag between authorization to borrow and actual outlays.

**Future Projects.**—The preparation of a time schedule for the public works already in the main planned and for which arrangements for financing have in large part been made is again the difficult problem. Much is known regarding the future permanent improvements of the government of the State of New York and of such a body as the Port of New York Authority, but the conver-

sion of these known plans into forecasts of annual expenditures can be regarded only as approximate estimates. Such estimates of future projects, made as of November, 1929, are contained in the following tabulation:

1. State institutions, planned, but not yet begun.....	\$ 44,500,000
2. State institutions actually under construction. Contracts amounting to \$67,000,000 have already been let. It is estimated that half of this work has been completed, leaving contracted expenditures for the future.....	33,500,000
3. Highways and bridges, probable minimum annual expenditures in future .....	43,000,000
4. Elimination of grade crossings, planned, minimum estimate..	30,000,000
5. Canals, approximate annual expenditure not more than.....	1,000,000
6. Port Authority, program for next 2¼ to 2½ years involves estimated expenditure of \$56,000,000 or an annual expenditure of .....	23,200,000
Total.....	\$175,200,000

This total of \$175,200,000 which is, of course, far in excess of the annual expenditures of both New York State and the Port of New York Authority during the past years is no forecast of what will actually be spent during any of the next years. It is at the best an estimate of the amount that could be spent in any year, if an emergency dictated maximum expenditures and if the usual obstacles to the swift execution of public works were minimized.

**The Planning and Control of Permanent Improvements.**—Viewed historically, the program of permanent improvements of the New York State government suffered what may be described as a natural retardation because of the reluctance of the authorities to finance public works by long-term loans and because of their inability to pay for larger projects out of current income. Acceleration has thus been achieved in these latest years by a change in financial policy and the financing of many projects through borrowings. Aside from unfavorable conditions in the money market, there is still a substantial lag between the time when additional funds become available or can be made so and the time when a specific project is planned, initiated, and completed. The experience of individual state departments indicates that projects can frequently be accelerated, even in the face of what are normally regarded as limiting factors.

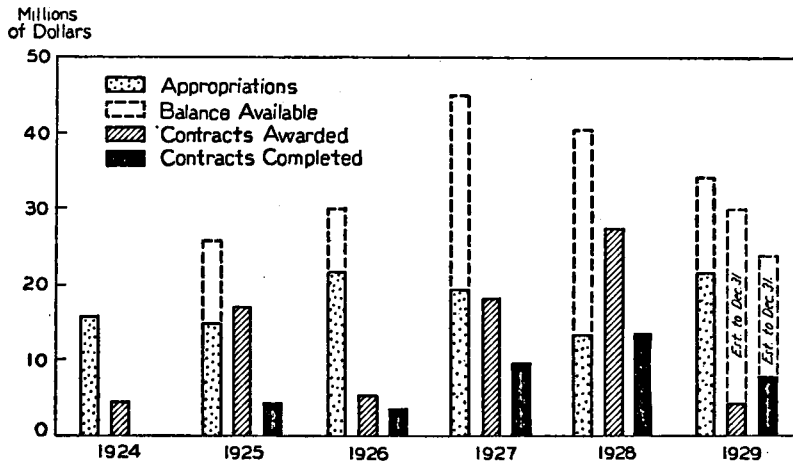
The State Division of Highways normally supervises 350 miles of new construction a year and 400 miles of reconstruction. It is conservatively estimated that there are about 4,000 miles of high-

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ways of the state system which require reconstruction and widening within the next four years. At the rate prevailing in the past, it would take ten years to complete this amount of work. It is believed that decided economy would be achieved if the work were done in four years.<sup>43</sup>

It is not difficult to increase highway construction at short notice. The chief factor which holds up construction work is the

CHART 12.—APPROPRIATIONS FOR BUILDING, BALANCES AVAILABLE FROM PREVIOUS YEARS, CONSTRUCTION CONTRACTS AWARDED AND COMPLETED, NEW YORK STATE GOVERNMENT, 1924-1929.



Source: New York State Department of Public Works; *Report to the Governor on Progress of Building Construction, August, 1929.*

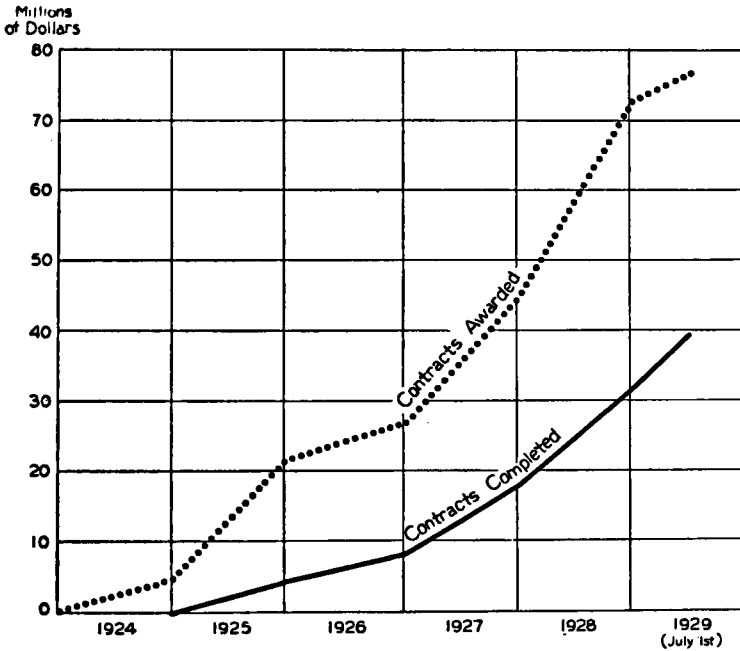
necessity of acquiring the right of way from the counties. Were it not for this, the Division of Highways would be ready to let all its contracts as soon as funds become available. Contracts in various stages of completion are held up for one reason or another, but the plans for all of them are complete and much work is on the books of the Division, at any moment. If, also, emergency funds become available, plans could be drawn very rapidly, since planning of this type of work is largely standardized.

The counties have to acquire the right of way for the state. The Public Works Department submits its plans and other relevant

<sup>43</sup> Interview with C. C. Ahles, Senior Assistant Engineer, Division of Highways, Department of Public Works.

material to the county authorities for their approval. This could be rapidly obtained were it not for the fact that the authorization lies in the hands of the supervisors who are not permanent officials. The necessity of acquiring the right of way in this manner often involves the greatest delays in the progress of the construction

CHART 13.—RELATION BETWEEN TOTAL VALUE OF BUILDING CONTRACTS AWARDED SINCE JANUARY 1, 1924, AND CONTRACTS COMPLETED SINCE JANUARY 1, 1925, NEW YORK STATE GOVERNMENT.



Source: New York State Department of Public Works; Report to the Governor on Progress of Building Construction, August, 1929.

work. It often takes as much as six to nine months to acquire the right of way in any given instance.

In the elimination of grade crossings, also, retardation of the projects is due partly to joint administration by the state and the railroads and partly to extended, quasi-judicial procedures that

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necessarily precede the ordering of any specific elimination project. In the fall of 1927, the Department of Public Works submitted to the Public Service Commission a program covering 202 elimination projects recommended for consideration during 1928. At the close of 1928, however, the projects ordered during the year numbered only 122 at an estimated cost of less than \$18,000,000, while the number placed under construction during the year was 65, at an estimated cost of a little more than \$2,500,000. The number completed during the year was 34 and their estimated cost was \$852,000.<sup>44</sup>

For any major elimination project, it is estimated that about two years of negotiation and preparation are required before construction work is begun.<sup>45</sup> About one year on the average is consumed with hearings, decisions, the issuing of instructions and the like; a second year is required for making detailed plans, specifications and organizing the work. Hearings on a project are held, after the Public Service Commission has placed the particular project on the official program for consideration. The railroads, the state represented by the Public Works Department, and the local authorities appear before the Commission. The Public Works Department or the railroad is then authorized to prepare surveys and preliminary estimates of cost. Each elimination project is thus considered separately and the procedure described is involved in the consideration of each one of them.

At later hearings the plans are presented before the Commission. The railroads, the local authorities, and the Public Works Department then have an opportunity to criticize one another's plans, either in their engineering or financial aspects. At times as many as ten different plans have been presented to the Commission. Finally the Commission closes the hearings. It then chooses one of the plans, with such changes as it deems necessary, and directs either the railroad or the Public Works Department to proceed with the project in accordance with the provisions of its order. After this, either the railroad or the Public Works Department proceeds with the preparation of detailed plans, specifications and the letting of contracts.

<sup>44</sup> New York State, Department of Public Works, *Annual Report of the Superintendent*, 1928, p. 67.

<sup>45</sup> Interview with H. O. Schermerhorn, Engineer of Bridges and Grade Crossings, Division of Engineering, Department of Public Works.



TABLE 25. — COURSE OF EMPLOYMENT ON STATE HIGHWAYS  
IN NEW YORK STATE, 1923-1929

DATE *	NUMBER EMPLOYED BY CONTRACTORS	MAINTENANCE FORCE EMPLOYED BY STATE	TOTAL
<b>1923</b>			
July.....	7,078	5,298	12,376
August.....	6,928	4,263	11,191
September.....	5,879	3,965	9,844
October.....	5,006	3,389	8,395
<b>1924</b>			
May.....	4,093	4,728	8,821
June.....	7,112	4,844	11,956
July.....	7,827	5,097	12,924
August.....	8,396	4,776	13,172
September.....	7,837	4,584	12,421
October.....	6,575	4,595	11,170
November.....	4,970	3,994	8,964
<b>1925</b>			
May.....	6,680	4,997	11,677
June.....	7,735	5,368	13,103
July.....	7,932	5,327	13,259
August.....	8,148	5,422	13,570
September.....	7,381	5,039	12,420
October.....	5,166	4,521	9,687
November.....	3,585	2,633	6,218
<b>1926</b>			
May.....	5,444	4,958	10,402
June.....	6,831	5,596	12,427
July.....	7,908	5,868	13,776
August.....	8,048	5,699	13,747
September.....	8,174	5,416	13,590
October.....	6,463	4,803	11,266
November.....	4,589	3,658	8,247
<b>1927</b>			
May.....	6,662	5,506	12,168
June.....	8,866	6,150	15,016
July.....	10,104	5,861	15,965
August.....	10,628	5,539	16,167
September.....	9,653	5,014	14,667
October.....	7,809	4,865	12,674
November.....	5,531	3,770	9,301

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TABLE 25. — COURSE OF EMPLOYMENT ON STATE HIGHWAYS  
IN NEW YORK STATE, 1923-1929—(Continued)

DATE *	NUMBER EMPLOYED BY CONTRACTORS	MAINTENANCE FORCE EMPLOYED BY STATE	TOTAL
<i>1928</i>			
May.....	6,445	6,098	12,543
June.....	7,762	6,103	13,865
July.....	9,173	6,193	15,366
August.....	10,635	6,246	16,881
September.....	9,856	5,572	15,428
October.....	7,773	4,919	12,692
November.....	5,700	3,250	8,950
<i>1929</i>			
May.....	7,006	5,709	12,715
June.....	8,785	5,771	14,556
July.....	9,517	5,813	15,330
August.....	10,316	5,843	16,159
September.....	9,248	5,373	14,621
October.....	7,548	4,991	12,539
November.....	5,345	3,200	8,545

Source: New York State, Department of Public Works, Division of Highways.

\* Covers last week of month indicated. No data available, December through April.

By the terms of the Grade Crossings Elimination Act,<sup>46</sup> the difficulties in acquiring right of way required for grade crossing elimination work are not as great as they are in the case of highway construction. Under present conditions possession can be taken of property, as soon as a map is filed, whereas the outright purchase of land or the conduct of condemnation proceedings formerly delayed the work for three or four months. Now the land is taken first and disputes and settlements adjusted later.

These two illustrations of important and expensive permanent improvements, projected by the government of the State of New York, do not reveal any inherent obstacles to the acceleration of the enterprises at times when sound public policy would appear to dictate speed. The significant fact is that these improvements are normally retarded, and not necessarily on account of insuperable financial problems or because of the unimportance of the project.

<sup>46</sup> New York State, *The Highway Law*, 1929, p. 379 ff.

**The Numbers Employed on Public Works.**—A large part of the public works of the government of New York State and of special enterprises, like those of the Port Authority of New York, is farmed out to contractors and no record of contractors' payrolls is available. It is for this reason impossible to estimate the total numbers employed on such projects. Judged by the experience of New York City, it is probable that the New York State government employed on the average in 1929, directly and indirectly, some 20,000 persons. The record of employment in the construction and maintenance of state highways, given in Table 25, shows an average employment, during seven months from May to November, of more than 13,000, with very decided seasonal fluctuations.

## CHAPTER IV

### FEDERAL CONSTRUCTION <sup>47</sup>

Expenditures of the federal government on public works were less in 1929 than in 1919. During the same period the amounts spent by state and local governments increased steadily. Two factors account for this condition. Even as late as 1919, local governments were still feeling the effects of war restrictions on public construction and their expenditures did not begin to rise until a year or two later. The federal government, on the other hand, continued for several years after the close of the war on a high level of expenditure for its military and naval equipment.

In the last years of the past decade the federal government has been spending annually on new construction and on repairs and maintenance, roughly two and one-half times as much as New

**TABLE 26. — EXPENDITURES ON NEW CONSTRUCTION AND ON REPAIRS AND MAINTENANCE BY THE FEDERAL GOVERNMENT, 1919-1929**

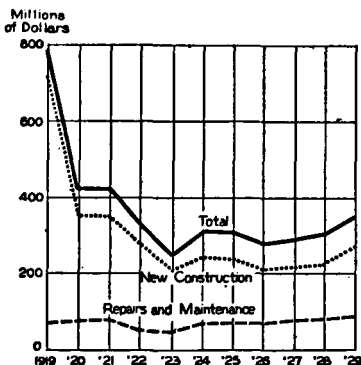
(In thousands)

YEAR	NEW CONSTRUCTION	REPAIRS AND MAINTENANCE	TOTAL
1919.....	\$716,532	\$71,597	\$788,129
1920.....	349,700	72,146	421,846
1921.....	346,704	73,892	420,596
1922.....	276,545	48,864	325,409
1923.....	204,114	43,431	247,545
1924.....	240,041	70,401	310,442
1925.....	238,282	70,838	309,120
1926.....	206,537	67,925	274,462
1927.....	213,130	76,568	289,698
1928.....	222,331	81,337	303,668
1929.....	266,149	86,287	352,436

<sup>47</sup>The quotations in this chapter describing the activities of various federal departments are taken from memoranda or letters from the various federal departments furnished, for the purpose of this study, by the Division of Building and Housing of the Bureau of Standards, United States Department of Commerce.

York City, and probably about one-tenth of the total amount spent on all public works of the country.<sup>48</sup> The statistics of the expenditures on repairs and maintenance appear to be more adequately reported for the federal government than are the total expenditures on permanent improvements by other agencies of government. If allowance is made for this factor, federal expenditures would be proportionately less than the present data indicate.

CHART 14.—EXPENDITURES ON NEW CONSTRUCTION AND ON REPAIRS AND MAINTENANCE BY THE FEDERAL GOVERNMENT, 1919-1929.



Federal government funds for construction are dispensed throughout the entire nation and its dependencies. Such major items as the inland waterway system, the great irrigation projects in the west, the maintenance of channels at ocean ports, the federal aid grants for state highway construction, and the ten-year building program for post offices and federal buildings to house federal government activities in cities throughout the country are well known. Activities of the Lighthouse Service and the patrol and life saving service of the Coast Guard extend throughout the whole length of our coastline. Extensive road systems are being developed in the national parks and national forests. The War Department is engaged in equipping its army posts with proper quarters for officers and men. The Veterans' Bureau has recently

\* For the detailed tables of new construction and maintenance and repairs, see Appendix G, Tables 1 and 2. The geographical distribution of new construction, classified by types of construction, is shown in Appendix G, Table 3.

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been authorized to add more than fifteen million dollars worth of hospitals to its already extensive facilities in various sections of the country. Federal penitentiaries, fish cultural stations, customs houses, immigration stations, Indian schools, the nine hundred and more land stations of the Navy, the Alaskan Railway and the Panama Canal suggest the variety in type and location of federal structures. The government of the District of Columbia carries on all types of construction common in municipalities, including schools, streets, fire and police stations and park improvements.

TABLE 27. — EXPENDITURES ON NEW CONSTRUCTION BY THE FEDERAL GOVERNMENT IN 1929 AND IN PERIOD 1919-1929

TYPE OF CONSTRUCTION	EXPENDITURES	
	1929	1919-1929
Buildings and ground improvement.....	\$45,537,094	\$656,603,167
Roads.....	101,212,185	881,971,767
Drainage, irrigation, power, water, dams, etc.....	29,726,305	285,266,381
Floating equipment.....	50,221,130	1,119,431,730
Waterways and waterfront improvements.....	31,294,407	295,025,527
Miscellaneous.....	8,158,301	41,766,155
<b>Total for all new construction.....</b>	<b>\$266,149,422</b>	<b>\$3,280,064,727</b>

During the eleven years, from 1919 to 1929, there has been a decided shift in the nature of federal expenditures for public works. Of a total expenditure in 1919 of \$788,000,000, nearly \$459,000,000 was used by the Navy Department and more than \$200,000,000 by the Quartermaster Corps of the Army; in that year the Bureau of Public Roads of the United States Department of Agriculture spent only \$3,750,000 on roads. By 1929 road building had become the leading item of federal expenditure.

Four departments of the federal government, the Bureau of Public Roads, the Navy Department, the Corps of Engineers, which does the civilian work of the War Department, and the Quartermaster Corps of the War Department, spent in 1929, \$220,000,000, out of a total federal expenditure of about \$266,000,000.

Road building in the construction budget of the federal government has come to occupy a place of growing importance, as it

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**TABLE 28. — EXPENDITURES ON NEW CONSTRUCTION BY LEADING DEPARTMENTS OF THE FEDERAL GOVERNMENT, 1929**

DEPARTMENT	EXPENDITURES
Bureau of Public Roads.....	\$91,504,912
Navy Department.....	59,094,884
Corps of Engineers, War Department.....	56,754,535
Quartermaster Corps, War Department.....	12,787,518
Total for all departments *.....	\$266,149,422

\* This figure is not the sum of the items listed above, as it includes expenditures by all departments.

has in the public works program of the country as a whole. From a relatively low level in 1919, outlays for highway construction have risen to an average of more than \$90,000,000 a year in the period since 1924. It is noteworthy that expenditures increased rapidly during 1921 and 1922, years of depression, and fell in 1923, a year of considerable business activity.

**TABLE 29. — EXPENDITURES ON ROADS BY THE FEDERAL GOVERNMENT, 1919-1929 \***

YEAR	EXPENDITURES
1919.....	\$3,752,750
1920.....	23,538,932
1921.....	60,942,866
1922.....	93,075,012
1923.....	79,447,720
1924.....	100,786,460
1925.....	102,052,823
1926.....	89,194,519
1927.....	90,002,525
1928.....	89,368,770
1929.....	91,504,912

\* These represent only expenditures controlled by the U. S. Department of Agriculture, Bureau of Public Roads, and do not include amounts spent for road building by the Corps of Engineers, War Department.

Expenditures on maintenance and repairs have amounted during the whole period, 1919-1929, to something less than 20 per cent

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of the amount spent for new construction. The heaviest outlays for this purpose were made by the Navy Department, the Corps of Engineers of the War Department, and by the United States Shipping Board; but substantial amounts were also spent by the Engineering Department of the District of Columbia, the Bureau of Reclamation and by the Division of Public Buildings and Public Parks.

TABLE 30. — EXPENDITURES ON REPAIRS AND MAINTENANCE BY LEADING DEPARTMENTS OF THE FEDERAL GOVERNMENT, 1919-1929

DEPARTMENT	EXPENDITURES
Department of the Interior	
Bureau of Reclamation.....	\$24,001,052
Navy Department.....	312,098,446
War Department	
Corps of Engineers.....	223,017,719
Quartermaster Corps.....	12,205,362
United States Shipping Board.....	96,062,046
District of Columbia Engineering Department.....	25,571,654
Public buildings and public parks.....	18,333,962
<b>Total for all departments *.....</b>	<b>\$773,235,618</b>

\* This total is not the sum of the items listed as it includes other smaller expenditures.

The Navy Department estimates that, under present conditions, repairs to ships require \$10,000,000 annually. Maintenance and repair expenditures of the United States Engineer Corps arise out of work on canals, locks and dams; on river and harbor improvement; and on various flood control operations. The expenditures for this purpose by the Shipping Board do not include ship repairs and reconditioning, since this work is done "in private shipyards, except for an occasional reconditioning job and the periodical drydocking of the Leviathan, which is done in a Navy Yard."

**The Procedure of Federal Expenditures on Public Works.**— Since the Federal Budget Act was adopted in 1921 there has been a radical change in procedure for making appropriations for federal government construction. Prior to that time, expenditures for various purposes were handled by separate congressional committees, each of which had the recommendations of only one or a few bu-



reus before it, but none of which saw all the requirements in relation to one another. There was relatively little coordination between the departments in submitting estimates, and contacts between congressional committees for the purpose of securing a proper balance between the various needs were admittedly inadequate.

Under the budget system, the estimates of the different federal departments are brought together by the Director of the Budget, who as the President's agent consults with the heads of the departments and individual establishments. The President submits estimates for all the departments at one time in the annual budget, which also shows estimated receipts. The budget estimates are reviewed first by the Committee on Appropriations of the House of Representatives; all appropriation measures must, according to the Constitution, originate in the House. After action by the House, the various departmental appropriation bills are acted upon by the Senate, and when the two agree, the measures go to the President for approval before becoming effective.

An essential feature of the budget system, which is often not fully understood, is the fact that the appropriation bills may include only such items as have been authorized already by other legislation. In some cases, a department or bureau has general authorizations that stand indefinitely. Thus, the Bureau of Lighthouses has standing authorization for the construction of lighthouses and light ships. Practically all departments have standing authorizations for necessary repair and maintenance work. On the other hand, the construction of a hydraulic laboratory at the Bureau of Standards has been held to require a special act authorizing the project before an appropriation act could be made actually providing the money. Similarly, appropriations for Mississippi flood control can be made only in accordance with general legislation on the subject, and appropriations for harbor improvements can only be made on projects that have been specifically approved in authorizing legislation. Authorizations covering construction programs requiring several years to execute are frequently made, but the authorization does not bind the Congress in making its annual appropriations to appropriate as much as has been authorized. Some projects are authorized and are never carried out.

It is a growing practice among federal departments to map out construction programs several years in advance. Thus, the Depart-

ment of Justice recently mapped out a seven-year program for construction of federal penitentiaries and other penal institutions, and this was authorized by Congress. The Quartermaster Corps of the Army is now carrying out what it regards as a ten-year army post housing program. In view of a constitutional provision against providing funds more than two years in advance for the support of the army, the program has not been formally authorized by Congress. But Congress can see that each year's appropriations are a part of the long-term program.

The appropriation bills are ordinarily passed during the winter or early spring, and the funds usually become available July 1. Items for new construction are generally available until spent, but a number of bureaus reported that they were handicapped because of provisions that the funds would lapse if not spent within the twelve months of the fiscal year. In some cases, such as river and harbor appropriations, funds are made available on passage of the act. Such a provision was included in several of the appropriation bills presented to Congress in the winter of 1929-1930, in order to permit the acceleration of proposed projects.

Most of the funds for repairs and maintenance of buildings become available July 1 and lapse if not used by June 30 of the next year. In some cases this results in urgent work being held up until just after July 1. In other cases, administrative officers hold funds in reserve until towards the end of the fiscal year as a precaution against contingencies. The fiscal calendar thus tends to throw certain types of outdoor work into the busiest season although it tends to promote the handling of repairs to heating apparatus and some other work at times of slack seasonal employment in the trades involved.

In general, the fiscal calendar seems most apt to impose limitations on units expending relatively small sums on a limited number of projects, which are probably less flexible in adjusting themselves, and where the difficulties are not so great and obvious as to compel specific remedies on the part of Congress.

In the federal government, then, the making of the budgets of public construction projects is a joint enterprise of legislative and executive agencies. An adequate view of the procedure involved in federal expenditures for permanent improvements can best be got by examining the practices of several executive departments of the federal government.

1. Road Building.—One of the most systematic of the federal programs of public works is the plan for federal-aid payments to states for cooperative highway construction and for forest road construction. Federal expenditure for this purpose has mounted in recent years to more than \$90,000,000 a year. Authorizations made by federal legislation for highway construction from 1917 to 1931 are shown in Table 31:

TABLE 31. — AUTHORIZATIONS FOR HIGHWAY CONSTRUCTION MADE BY FEDERAL LEGISLATION DURING THE FISCAL YEARS 1917-1931 \*

(In thousands)

YEAR	FEDERAL AID TO STATES	FOREST ROADS <sup>b</sup>	TOTAL
1917.....	\$5,000	\$1,000	\$6,000
1918.....	10,000	1,000	11,000
1919.....	65,000	4,000	69,000
1920.....	95,000	4,000	99,000
1921.....	100,000	4,000	104,000
1922.....	75,000	6,000	81,000
1923.....	50,000	11,000	61,000
1924.....	65,000	7,500	72,500
1925.....	75,000	7,500	82,500
1926.....	75,000	8,500	83,500
1927.....	75,000	7,500	82,500
1928.....	75,000	7,500	82,500
1929.....	75,000	7,500	82,500
1930.....	75,000	7,500	82,500
1931.....	125,000	7,500	132,500
	\$1,040,000	\$92,000	\$1,132,000

Sources: United States Department of Agriculture, Bureau of Public Roads.

\* Federal aid to states must be matched with state funds and payments may be made on monthly estimates as work progresses.

<sup>b</sup> This authorization is for construction of roads in or adjacent to the national forests, and is expended directly by the Department of Agriculture.

Actual expenditures in each year of the decade from 1920 to 1929, both for forest roads and in the form of federal aid to states, increased from nearly \$25,000,000 in 1920 to \$108,000,000 in 1925, and have continued at the rate of more than \$90,000,000 a year since. For 1931, 1932 and 1933, federal appropriations to states have been increased by \$50,000,000, or from \$75,000,000 to \$125,000,000 a year.

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Federal aid to states for highway construction is a form of public expenditure similar to grants made for various public improvements by states to local governments.

Under the terms of the Federal Highway Aid Act of November, 1921,<sup>49</sup> the Secretary of Agriculture is authorized to cooperate

TABLE 32. — EXPENDITURES FOR FEDERAL AID PAYMENTS TO STATES FOR COOPERATIVE HIGHWAY CONSTRUCTION AND FOR FOREST ROAD CONSTRUCTION MADE BY THE DEPARTMENT OF AGRICULTURE DURING FISCAL YEARS 1920-1929 \*

YEAR	FEDERAL AID TO STATES	FOREST ROADS	TOTAL
1920.....	\$20,340,774	\$4,338,777	\$24,679,551
1921.....	57,462,768	5,291,539	62,754,307
1922.....	89,946,604	3,859,504	93,806,108
1923.....	71,604,709	7,109,454	78,714,163
1924.....	80,447,824	9,356,025	89,803,849
1925.....	97,472,506	10,456,608	107,929,114
1926.....	89,362,111	10,294,997	99,657,108
1927.....	82,977,566	9,542,854	92,520,420
1928.....	82,513,834	8,570,405	91,084,239
1929.....	84,006,619	9,499,690	93,506,309
	<b>\$756,135,315</b>	<b>\$78,319,853</b>	<b>\$834,455,168</b>

SOURCE: United States Department of Agriculture, Bureau of Public Roads.

\* The expenditures in this table for the respective fiscal years do not agree with the annual totals as shown in the tables of federal construction expenditures for roads because the latter are taken from compilations based upon the fiscal years of the respective States which end June 30, September 30, November 30 or December 31, as the case may be.

with the several states through their state highway departments in the improvement of highways. A system of highways, known as the Federal Aid Highway System, is designated by the highway department of each state and approved by the Secretary of Agriculture. Such systems are limited by the law to seven per cent of the total highway mileage in each state, and federal aid can only be allotted to roads included in the systems. When provision has been made for the completion and maintenance of seven per cent of the total, the state is authorized to add to the system of federal aid highways. Before any project is approved by the Secretary of

\* Procedure under Federal Highway Act of November 9, 1921, United States Department of Agriculture, Bureau of Public Roads.

Agriculture, the state is required to make provision for state funds each year for the construction, repair and maintenance of all federal aid highways within the state. Standards of construction and materials, used in such construction, are set by the Secretary of Agriculture, and the work is subject to inspection and approval by him. Payments by the federal government are limited to fifty per cent of the actual cost and are not to exceed \$15,000 per mile, except in the case of bridges and for road building in states having unappropriated public lands.

2. Supervising Architect of the Treasury Department.—The procedure of this office is described as follows: <sup>50</sup>

“Prior to the passage of the Public Buildings Act of May 25, 1926, the initiation of federal building projects, both individually and collectively, had rested entirely with the Congress. Under this procedure bills would be introduced by members of Congress for buildings in localities in which they were interested; these in most cases involving acquisition of land. Such bills were then referred to the office of the Supervising Architect for report and estimate of cost. Of authorizations established under this system there were held over from previous legislation at the time of the passage of the Act of May 25, 1926, and specifically covered by Section 3 thereof, 69 authorizations for buildings, or sites and buildings, and in addition 151 for sites only.

“With the approval of the Public Buildings Act of May 25, 1926, a totally different . . . line of approach was inaugurated. This Act while fixing the total gross outlay to which the government might be obligated for public building construction within its purview, for the states, territories and possessions of the United States; . . . confines itself as regards selection of locations, to defining in a general way only the procedure to be followed; and except as regards principally authorizations held over from previous legislation, makes no attempt to specify individual projects. The Act approved February 24, 1928, amending the above, increases the total authorization and modifies the provisions covering distribution and rate of expenditure, but does not alter the method of selection.”

<sup>50</sup> Memorandum of the office of the Supervising Architect of the Treasury Department to the Division of Building and Housing, Bureau of Standards, United States Department of Commerce.

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Gross expenditures authorized by federal legislation are as follows:

Authorized by Act of May 25, 1926:	
District of Columbia, Sec. 5.....	\$ 50,000,000
Country at large.....	100,000,000
Completion prior authorization, Sec. 3.....	15,000,000
	<hr/>
	\$165,000,000
Carried on books from prior legislation, approximately	9,000,000
Act also makes available proceeds of sales of old government properties estimated at approximately.....	48,000,000
	<hr/>
	\$222,000,000
Authorized by Act of January 13, 1928:	
District of Columbia, acquisition of land.....	25,000,000
Authorized by Act of February 24, 1928:	
Country at large, additional authorization.....	100,000,000
	<hr/>
Approximate total authorized expenditures,	
Building program .....	\$347,000,000

"Of this amount, to date \$189,226,010.80 has been allocated and authorized for specific projects for the country at large, and \$47,968,741.00 for the District of Columbia projects, or a total of \$237,194,751.80." As regards the preliminary steps involved in a building program for the country at large, "the length of time required to carry a project to completion is influenced by so many factors that no very definite schedule of progress is possible.

"If the acquisition of a site is involved, this transaction may involve a period of a few months to one of a year or more dependent upon the submission of reasonable proposals or the necessity for condemnation. In the latter case with a large city involved where a large site comprising several parcels may be required the delay may considerably exceed a year. With a site acquired, the procedure of obtaining survey and soil data, together with any necessary supplementary space data, the preparation and approval of preliminary sketches, etc., may require about two months.

"For the preparation of working drawings the size of a project and the number of men available for it, together with possible preliminary changes in scheme for one consideration or another, all introduce variable factors, making the probable consumption of time from commencement to the point at which they are turned over for specifications from three to eight months.

"The specification, which is usually the work of one man, will

occupy for writing, duplication, and checking from four to six weeks.

"The period on the market for bids runs generally from four to six weeks and after opening if no complications have arisen two weeks is generally required in the awarding of a contract.

"The time allowed for completion of a contract is predicated principally upon the size and estimated cost of the project and the geographical position with reference to markets of supply, both material and labor; in connection with small jobs of relatively short duration, the question as to whether or not the winter season will probably find the job open or under roof must be considered." The thumb rule which is first applied is about as follows, subject to modification by the other factors mentioned:

For jobs up to.....\$	100,000	not	over	14	months.
	250,000	"	"	16	"
	750,000	"	"	18	"
	1,500,000	"	"	20	"
	2,500,000	"	"	24	"
	5,000,000	"	"	30	"
For jobs over.....	5,000,000	"	"	36	"

This statement by the Supervising Architect, of the elements of procedure and time involved in a federal building program, represents a view of normal operations. In the early months of 1930 when there has been the desire to accelerate federal construction operations, it has been found possible to modify many steps in this procedure and to hasten the time required for them. The speeding-up of condemnation proceedings and the employment of a larger staff of architects are a sample of the measures recently employed to facilitate the carrying out of the projected programs of public construction.

3. United States Engineer Corps.—The work of this department in the past ten years has been concerned with river and harbor improvement, lock and dam construction, construction of the Wilson Dam, flood control, operation and care of canals, and the maintenance of river and harbor improvements. In the conduct of its operations the department estimates that "a period of two weeks to a month for hired labor work and three to four months for work done by contract is required prior to commencement of construction after appropriations therefor have been made." No serious delays are contemplated in the future for the acquisition of sites,

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where the sites are to be acquired by the United States Government. It is estimated, also, by the Engineer Corps that the "detailed plans and specifications for any specific major item of the projected work for the next five years could be prepared within a period of from two to three months."

4. Quartermaster Corps.—The office of the Quartermaster General states that "under the present budget procedure it requires approximately two and one half years from the time a project is initiated in the field until the funds are made available for expenditure. This usually is the minimum interval. . . ."

"It is not always feasible to make detailed plans in advance of the appropriation; therefore, after the funds do become available it usually requires from three to twelve months to prepare suitable plans and to advertise for bids. Ordinarily the average contract time for completing construction work is approximately twelve months. . . ."

"As the beginning of the fiscal year comes in the height of the building season, it does have a tendency to retard construction work in the northern states as usually by the time plans and specifications are ready and advertising is called for, winter has already set in and work must be postponed until spring. . . ."

**Future Projects.**—The estimated future expenditures of the federal government are by no means an index of what will be spent during the next years. The estimate for 1930 alone is considerably below actual expenditures for new construction in 1929. At the most the figures are a rough indication of the probable cost of certain known projects of permanent improvement that are likely to be under way during the years specified.

The classification of these estimated future expenditures by controlling departments of the government throws some light on their inadequacy and uncertainty. They do not, first, include estimates of projected expenditures on roads, although here legislation has been enacted increasing the federal appropriations appreciably. The estimate of the Corps of Engineers is for the probable average expenditure during one year only made "on the assumption that work and appropriations will be continued normally as at present . . ." In the estimate of the Bureau of Reclamation there are included proposed expenditures "under the Boulder Canyon Project Act, which authorizes an expenditure of \$165,000,000. The time of



commencement of construction is dependent upon complying with certain provisions of the Act."

The Navy Department states that "new construction, amounting to about \$270,000,000 was authorized by Congress in 1928, and the last appropriation bill carries \$28,550,000 for new construction during the fiscal year 1930. It is not possible to predict what amounts will be available for this purpose during the next five or six years until appropriations are made by Congress, although it is estimated that repairs to ships will continue to require the annual expenditure of approximately \$10,000,000." The Navy Department, likewise, estimates that construction work on shore will in the next five years average \$5,500,000 a year.

**The Numbers Employed on Federal Public Works.**—No record is available of the number of persons employed on federal public works; nor is it possible to estimate the proportion of such work farmed out to contractors and the proportion done by hired labor.<sup>61</sup> The Corps of Engineers of the War Department has a record of the number of employees engaged in civil work which shows that the number so employed varied from 11,500 to more than 31,000.

**Control.**—Some light has already been thrown on the problem of controlling federal expenditures for permanent improvements by the description of the prevailing procedure of planning projects and carrying them through to completion. In the case of these types of federal expenditure most programs appear to be considerably in arrears. The problem of control here, as in the case of the local governments, appears to be one of acceleration. The Supervising Architect of the Treasury Department believes that "in dealing . . . with federal building construction" where many steps, such as investigation, acquisition of title to the land, preparation of plans and specifications, waiting for bids, "must precede actual construction . . . it would seem to be only in very exceptional cases that a project could be got under way in any given locality in time to offer relief to an acute industrial situation. . . ." He believes also that the preparation of building plans far in advance of construction "would result more often than not in their having to be extensively revised to meet changed requirements before they are finally issued."

The Corps of Engineers believes that existing and proposed projects cannot be economically delayed, but that the "amount of

<sup>61</sup> For some data on this matter, see Appendix G, Table 2.

TABLE 33.—NUMBER OF EMPLOYEES ENGAGED ON CIVIL WORK BY THE CORPS OF ENGINEERS OF  
THE WAR DEPARTMENT, 1920-1929

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Av. for year
1920	18,661	18,500	18,200	18,113	17,466	18,801	20,477	23,039	22,352	24,023	23,367	20,257	20,271
1921	19,131	17,416	16,087	15,458	16,861	18,659	21,153	22,278	20,840	20,417	17,798	13,026	18,260
1922	13,241	11,600	11,482	25,890	22,823	16,403	19,864	23,269	23,582	23,802	22,700	18,920	19,465
1923	17,738	16,139	15,893	17,427	20,092	23,033	26,237	28,555	27,510	26,557	24,942	20,361	22,040
1924	17,909	17,893	18,454	19,763	21,579	25,054	29,742	30,362	29,183	28,138	25,894	20,197	23,681
1925	20,499	19,664	19,192	21,142	24,134	27,354	28,857	29,000	25,914	22,223	19,136	16,280	22,783
1926	14,973	14,246	14,987	17,088	21,428	24,008	26,387	24,258	21,302	18,839	18,177	15,380	19,256
1927	14,201	14,148	15,328	30,292	18,986	19,011	22,097	24,048	24,902	24,198	20,232	16,425	20,322
1928	16,445	15,893	17,505	18,341	20,914	20,524	22,664	28,042	26,899	25,824	23,980	21,436	21,539
1929	20,243	19,107	19,682	20,103	24,395	23,539	26,829	31,383	30,769	29,421	26,552	22,892	24,576
Average	17,304	16,461	16,681	20,362	20,868	21,639	24,431	26,423	25,325	24,344	22,278	18,517	

work normally projected could be increased thirty per cent without undue disorganization or increased cost."

The experience of the federal government in the past six months, however, furnishes convincing evidence that the prevailing system of appropriations and expenditures is sufficiently elastic to permit occasional acceleration in construction operations when haste and expansion are desired by the government. The removal of various barriers to quick action and the increased appropriations for roads and other projects will without doubt raise the total federal expenditures for construction in 1930 considerably above the amounts spent in 1929.

## CHAPTER V

### PUBLIC AND PRIVATE CONSTRUCTION

One striking feature of the American business situation since 1922 has been the persistence of an unusually high level of construction activity. From 1919 to 1928 total annual construction increased without interruption and was in the latest year more than twice as large as in 1919. The year 1927 witnessed a slight drop in construction, but in 1928 the total rose to a new level for all times. The first severe drop during the whole of this period came in 1929 when total construction was more than \$800,000,000 below the year before and had dropped below the level prevailing in 1925.

This condition of large construction expenditures has been the source of considerable discussion. It has by some been regarded as one of the principal causes of the revival during 1922 and of the business prosperity since. Certainly the association of high industrial production and heavy outlays on all types of construction is an economic fact of profound significance. Those who explain the post-war spurt in construction in terms of war deficiencies, arising out of government restriction and the diversion of capital to other uses, probably regard the present movement as near its close. The most satisfactory analysis of this situation, however, discloses a close relation between construction expansion and higher standards of living in the country, and leads to the conclusion that such recessions as are experienced will proceed from a higher level than was the case in the past.<sup>52</sup>

Throughout the period since 1919, the largest single category of construction is that of residential building which in 1929 represented nearly one-third of the total. This group is followed in order of importance by the classes of public works and utilities, commercial buildings, and industrial buildings. The large drop in total construction in 1929 was almost wholly accounted for by the drop of

<sup>52</sup> *Recent Economic Changes*, National Bureau of Economic Research, Volume I, Chapter I, p. 62.

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more than \$900,000,000 in residential building, since all other groups either increased over 1928 or changed very slightly. The drop in residential building in 1929 is commonly explained as due to overbuilding in the preceding years and to the unusually tight

**TABLE 34. — ESTIMATED TOTAL CONSTRUCTION CONTRACTS AWARDED IN THE UNITED STATES, 1919-1930 \***

(In thousands)

Type	1919	1920	* 1921	1922	1923	1924
Commercial buildings .....	\$494,100	\$577,600	\$431,200	\$642,400	\$619,400	\$891,200
Educational buildings .....	145,600	224,200	313,600	391,500	381,600	429,500
Hospitals and institutions .....	47,700	65,700	91,300	119,100	93,300	131,200
Industrial buildings .....	624,700	766,300	225,700	421,000	541,300	412,800
Military, naval and public buildings .....	86,400	62,000	42,900	46,600	32,000	43,800
Public works and utilities .....	611,400	736,800	598,300	727,700	788,900	846,200
Religious and memorial buildings .....	45,700	63,900	76,600	111,400	106,400	139,200
Residential buildings .....	1,035,100	742,600	1,146,100	1,734,900	2,073,400	2,399,400
Social and recreational buildings .....	101,800	118,600	141,200	142,100	131,800	143,900
<b>Total .....</b>	<b>\$3,142,600</b>	<b>\$3,337,600</b>	<b>\$3,068,900</b>	<b>\$4,329,700</b>	<b>\$4,768,100</b>	<b>\$5,237,100</b>

Type	1925	1926	1927	1928	1929	1930 (ESTIMATE)
Commercial buildings .....	\$961,800	\$996,300	\$1,017,900	\$942,900	\$1,026,400	\$930,000
Educational buildings .....	470,100	412,200	407,200	425,300	413,200	440,000
Hospitals and institutions .....	122,200	144,000	135,700	176,600	166,700	176,000
Industrial buildings .....	541,200	727,500	542,900	677,200	786,500	750,000
Military, naval and public buildings .....	60,200	72,600	87,900	81,300	130,200	165,000
Public works and utilities .....	694,100	1,230,000	1,357,300	1,428,000	1,333,500	1,614,000
Religious and memorial buildings .....	168,800	161,000	203,600	138,400	114,700	130,000
Residential buildings .....	3,030,000	2,890,000	2,782,600	2,971,900	2,079,400	2,470,000
Social and recreational buildings .....	274,200	267,400	271,500	228,200	146,800	180,000
<b>Total .....</b>	<b>\$6,622,600</b>	<b>\$6,901,000</b>	<b>\$6,786,600</b>	<b>\$7,064,800</b>	<b>\$6,107,400<sup>a</sup></b>	<b>\$6,854,000</b>

Sources: F. W. Dodge Corporation, Statistical Division.

\* These figures exclude new construction and remodeling projects under \$5,000. In 1929 these low-cost projects were estimated as amounting to \$1,480,000,000; in 1930 to \$1,660,000,000.

<sup>a</sup> Preliminary estimate, slightly larger than the final figure given in Table 35.

condition of the mortgage and money market during parts of 1928 and 1929.

The decline in construction during 1929 took place during each month of the year, except in April, when the volume was slightly above that of 1928, and in July when there was a considerable increase over the earlier year. The report of the F. W. Dodge Corporation shows that December total construction was 24 per cent below November and 28 per cent below that of December, 1928.

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New work reported in the contemplated stage in thirty-seven states amounted in November, 1929, to \$720,301,000. This total represents a loss of 10 per cent from the amount reported in the preceding month and a drop of 23 per cent from the amount reported in November, 1928. However, in December, 1929, work in the contemplated stage in thirty-seven states rose to \$864,230,600.

TABLE 35. — ESTIMATED TOTAL CONSTRUCTION CONTRACTS AWARDED IN THE UNITED STATES, 1928 AND 1929 \*  
(In thousands)

MONTH	1928	1929
January.....	\$457,890	\$441,970
February.....	499,090	392,890
March.....	637,600	532,020
April.....	681,380	684,980
May.....	704,720	631,970
June.....	700,470	563,020
July.....	619,730	683,610
August.....	550,520	517,690
September.....	614,460	472,850
October.....	635,600	475,850
November.....	499,480	415,650
December.....	463,840	334,500
<b>Total for year.....</b>	<b>\$7,064,780</b>	<b>\$6,147,000</b>

Source: F. W. Dodge Corporation, Statistical Division.

\* These estimates are made on the basis of the construction contracts awarded in 37 states east of the Rockies. The part estimated is for the other 11 Western States. These figures, like other Dodge figures, do not include estimates for new buildings under \$5000 each, nor for remodeling and alteration under that minimum valuation.

The estimate of the volume of construction in 1930 (Table 34) is made by the F. W. Dodge Corporation on the assumption of an increase in residential construction during 1930. The data in Table 35 also probably understate the total volume of construction in the country because they exclude expenditures on remodeling and alterations and contracts under \$5,000 each. A new estimate for thirty-seven states for the years 1928, 1929, and 1930, which takes account of these last items, has been made by the Statistical Division of the F. W. Dodge Corporation and is shown in Table 36. Inclusion of these items increases the total annual volume of construction by more than \$1,500,000,000. On the forecast for 1930 Mr. Thomas S. Holden, vice-president of the F. W. Dodge Cor-

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**TABLE 36. — DODGE ESTIMATES OF TOTAL CONSTRUCTION CONTRACTS AWARDED, INCLUDING NEW BUILDINGS UNDER \$5,000 AND REMODELLING AND ALTERATIONS, 1928, 1929 AND 1930**

(In thousands)

GENERAL CLASS	37 STATES EAST OF THE ROCKY MOUNTAINS			11 WESTERN STATES
	1928	1929	1930 (ESTIMATES) *	1930 (ESTIMATES) *
Commercial.....	\$885,000	\$933,000	\$855,000	\$75,000
Industrial.....	635,000	756,000	700,000	50,000
Educational.....	399,000	382,000	407,000	33,000
Hospitals and institutions....	165,000	152,000	162,000	13,000
Public buildings.....	76,000	121,000	157,000	8,000
Religious and memorial.....	128,000	106,000	120,000	10,000
Social and recreational.....	214,000	140,000	165,000	15,000
<b>Total non-residential.....</b>	<b>\$2,502,000</b>	<b>\$2,590,000</b>	<b>\$2,566,000</b>	<b>\$204,000</b>
<b>Total residential.....</b>	<b>2,788,000</b>	<b>1,916,000</b>	<b>2,266,000</b>	<b>204,000</b>
<b>Total building projects of \$5000 and up.....</b>	<b>\$5,290,000</b>	<b>\$4,506,000</b>	<b>\$4,832,000</b>	<b>\$408,000</b>
<b>Public works and utilities....</b>	<b>1,338,000</b>	<b>1,248,000</b>	<b>1,497,000</b>	<b>117,000</b>
<b>Total construction (\$5000 and up).....</b>	<b>\$6,628,000</b>	<b>\$5,754,000</b>	<b>\$6,329,000</b>	<b>\$525,000</b>
<b>Add:</b>				
Estimates for 11 Western States.....	\$436,000	\$393,000	\$525,000	....
Estimates, new buildings under \$5000 each.....	871,000	740,000	775,000	....
Estimated remodelling and alterations.....	739,000	740,000	885,000	....
<b>Estimated total construction United States.....</b>	<b>\$8,674,000</b>	<b>\$7,627,000</b>	<b>\$8,514,000</b>	<b>....</b>

Sources: F. W. Dodge Corporation, Statistical Division.

\* Estimates computed December 15, 1929.

poration, made the following statement: "These estimates are preliminary, tentative, and subject to possible revision before F. W. Dodge Corporation's final estimates are published; they do not at present include any figures to cover public buildings and public

works that may be undertaken under proposed emergency appropriations made for the purpose of stabilizing business. . . . A moderate increase over 1929 is provided in the estimated figures for 1930, on the anticipation of a definite upturn in contract volume some time during the first half of 1930. Marked improvement early in the new year would be likely to produce a total volume greater than the figure estimated here."<sup>53</sup>

**Public Construction.**—The estimates of the total volume of public construction in the United States, used in this chapter, are based in part on the statistics of contracts awarded, furnished by the F. W. Dodge Corporation and in part on data derived from other sources. Because of the character of the basic data, it is impossible to carry these estimates back of 1923 and beyond 1928. While it might be desirable to derive an estimate of the volume of public works from the reports of the expenditures of all governmental agencies of the country, such a procedure would involve a huge task of collecting data and problems of accounting that are at this time insoluble.

According to the following tabulation public construction increased from nearly \$2,000,000,000 in 1923 to more than \$3,500,000,000 in 1928. The years of the largest increases were 1924 and

Year	Estimated Volume of Public Construction in the United States *
1923	\$1,993,000,000
1924	2,500,000,000
1925	2,594,000,000
1926	2,847,000,000
1927	3,488,000,000
1928	3,599,000,000

\* The details of these estimates are given in Table 42, and pp. 123-125, below.

1927. From 1923 to 1928 public construction appears to have increased at a slightly more rapid rate than total construction. Moreover, for this period, the records of engineering construction, kept by the Engineering News-Record, indicate that the course of public construction follows substantially the same trend. The total of public construction in 1929 is very slightly below that for 1928.<sup>54</sup>

<sup>53</sup> *New York Times*, December 16, 1929.

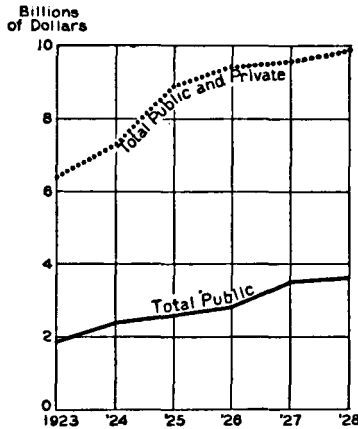
<sup>54</sup> See Table 39.



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Data of the distribution of public construction among various types of public works are not available for the country as a whole. Some notion of the channels of public expenditures can be got from Tables 37 and 38, which give, from 1923 to 1929, a classification of public contracts awarded in 36 and in 27 states. These tables, like the data on state and city expenditure, show that the construction of public and educational buildings and the construction of roads,

CHART 15.—ESTIMATED TOTAL VOLUME OF PUBLIC AND PRIVATE CONSTRUCTION IN THE UNITED STATES, 1923-1928.



bridges and streets are the principal classes of expenditure on public permanent improvement.

**Geographical Distribution of Public Works.**—While there are notable exceptions to the rule, expenditure on public works varies roughly with the population of the area and with the number of large cities in it.<sup>85</sup> In all of the districts, also, expenditures are concentrated in much the same categories—educational and public buildings, and road, street and bridge construction.

**The Numbers Directly Employed on Public Construction.**—The statistics of the numbers employed on the various kinds of construction work in this country are notoriously inadequate. Construction work, both public and private, is in the main done by changing groups of contractors who keep their own payroll records

<sup>85</sup> For details, see Appendix H, Tables 1-8.

TABLE 37.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN 36 STATES, 1923-1929<sup>a</sup>

(In thousands)

Purpose	1923	1924	1925	1926	1927	1928	1929
Educational buildings . . . . .	\$273,263	\$294,654	\$308,705	\$367,059 <sup>b</sup>	\$368,803 <sup>b</sup>	\$384,591 <sup>b</sup>	\$369,527 <sup>b</sup>
Hospitals and institutions . . . . .	78,057	112,195	108,502	130,644	158,788	162,034	149,030
Military and naval buildings . . . . .	3,527	2,202	6,165	8,613	8,855	14,528	9,041
Public buildings . . . . .	23,284	35,315	45,938	54,412	66,098	57,311	107,822
Waterfront developments . . . . .	40,417	47,254	30,656	38,959	43,098	54,320	78,111
Bridges . . . . .	65,539	74,855	92,050	123,098	175,059	166,636	122,168
Incinerators . . . . .	2,603	2,908	1,933	2,902	6,766	3,789	2,361
Lighting systems . . . . .	19,925	18,104	38,985	29,535	27,195	24,498	34,726
Docks and piers . . . . .	15,617	10,362	18,158	•	•	•	•
Subways and tunnels . . . . .	8,575	32,452	66,860	70,000 <sup>d</sup>	80,000 <sup>d</sup>	85,000 <sup>d</sup>	95,000 <sup>d</sup>
Sewage systems . . . . .	54,689	55,735	99,232	94,857	137,067	110,493	105,828
Street paving and road construction . . . . .	352,229	346,475	417,127	496,754	571,454	610,561	577,412
Water supply systems . . . . .	42,261	58,074	49,798	70,662	65,160	102,237	48,849
Parks (public) . . . . .	1,454	853	1,356	1,968 <sup>e</sup>	4,829 <sup>e</sup>	2,157 <sup>e</sup>	2,285 <sup>e</sup>
Total public construction . . . . .	\$981,440	\$1,091,438	\$1,285,465	\$1,489,463	\$1,713,172	\$1,778,155	\$1,702,160
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers) . . . . .	\$1,003,272	\$1,121,409	\$1,304,946	\$1,419,463	\$1,633,172	\$1,693,155	\$1,607,160

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> The 36 states included are the same as those covered by Table 38 of 27 northeastern states; and in addition: North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas and Louisiana.

<sup>b</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these four years. In 1923 they amounted to \$46,023,500; in 1924 to \$72,785,300; and in 1925 to \$104,498,700.

<sup>c</sup> Not reported in these four years.

<sup>d</sup> Not reported in these four years. Figures represent mainly estimates of subway construction in New York City.

<sup>e</sup> Estimated as one-half total parks.

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TABLE 38. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN 27 NORTHEASTERN STATES, 1919-1929\*  
(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Educational buildings.....	\$108,902	\$157,041	\$217,441	\$252,825	\$234,199	\$250,447	\$273,963	\$321,125 <sup>b</sup>	\$323,780 <sup>b</sup>	\$345,267 <sup>b</sup>	\$342,738 <sup>b</sup>
Hospitals and institutions...	39,192	50,543	70,095	86,629	61,967	98,041	97,634	120,835	148,981	153,725	140,782
Military and naval buildings..	16,432	12,997	6,372	3,593	2,966	2,112	5,212	7,462	7,913	12,900	7,732
Public buildings.....	13,422	26,648	26,563	32,431	19,168	28,101	34,502	43,897	56,819	50,683	99,552
Waterfront developments....	42,964	23,741	20,283	25,756	84,976	32,096	19,055	27,558	31,456	46,288	43,984
Bridges.....	39,551	56,642	45,846	40,434	51,754	62,353	75,059	100,077	154,103	129,366	103,680
Incinerators.....	539	477	471	611	2,332	2,529	1,429	2,483	5,972	3,088	2,075
Lighting systems.....	3,406	61,894	6,778	12,866	18,727	15,115	32,244	26,370	24,230	23,120	27,125
Docks and piers.....	15,791	37,592	7,750	18,836	10,999	7,242	15,410	"	"	"	"
Subways and tunnels.....	6,682	4,905	2,152	27,232	8,490	32,372	66,776	70,000 <sup>d</sup>	80,000 <sup>d</sup>	85,000 <sup>d</sup>	95,000 <sup>d</sup>
Sewage systems.....	57,713	41,944	48,772	50,907	51,359	51,077	89,416	85,641	125,487	104,539	99,958
Street paving and road construction.....	252,518	239,275	284,038	324,176	294,125	273,212	302,843	375,100	465,867	518,871	508,878
Water supply systems.....	18,615	47,074	34,015	34,099	35,794	48,211	40,889	59,675	57,607	95,782	45,105
Parks (public).....	710	1,583	433	2,000	1,324	604	700	1,814 <sup>e</sup>	4,723 <sup>e</sup>	1,834 <sup>e</sup>	2,118 <sup>e</sup>
Total public construction..	\$616,437	\$762,356	\$771,009	\$912,395	\$828,180	\$903,512	\$1,055,132	\$1,242,037	\$1,486,938	\$1,570,463	\$1,518,707
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers).....	\$604,577	\$735,216	\$784,378	\$915,774	\$845,771	\$930,598	\$1,068,473	\$1,172,037	\$1,406,938	\$1,485,463	\$1,423,707

Source: F. W. Dodge Corporation, Statistical Division.

\* The 27 states included are Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Delaware, Virginia, West Virginia, Ohio, Kentucky, Illinois, Indiana, Iowa, Wisconsin, Michigan, Missouri, Kansas, Oklahoma, Nebraska, Minnesota, North Dakota and South Dakota; also the District of Columbia.

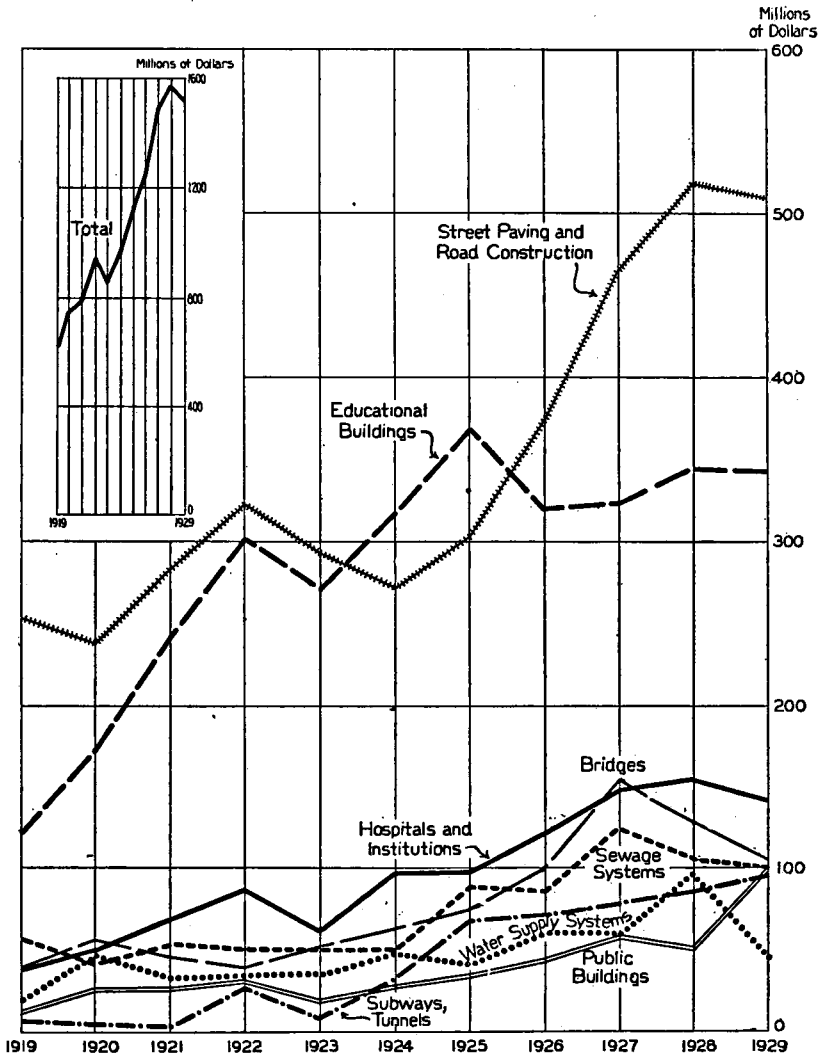
<sup>b</sup> Private schools, which have been subtracted from the figures for educational buildings in earlier years are included in these four years. In 1919 they amounted to \$10,612,603; in 1920 to \$15,257,400; in 1921 to \$23,270,800; in 1922 to \$49,446,900; in 1923 to \$37,080,100; in 1924 to \$66,700,000; and in 1925 to \$95,527,200.

<sup>c</sup> Not reported in these four years.

<sup>d</sup> Not reported in these four years. These figures represent mainly estimates of subway construction in New York City.

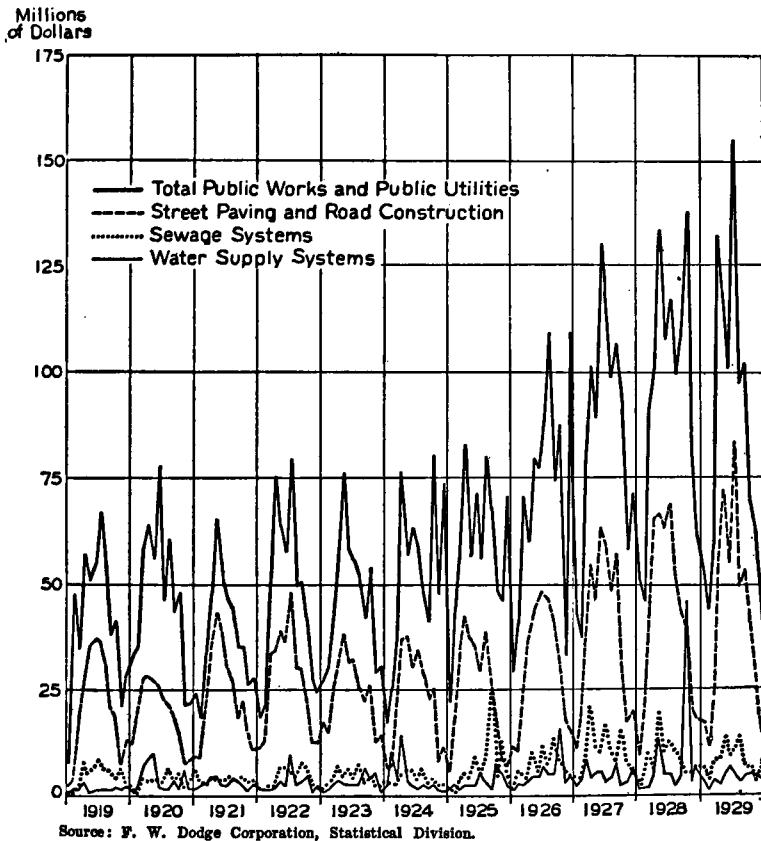
<sup>e</sup> Estimated as one-half total parks.

CHART 16.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN 27 STATES BY MAJOR CLASSES, 1919-1929.



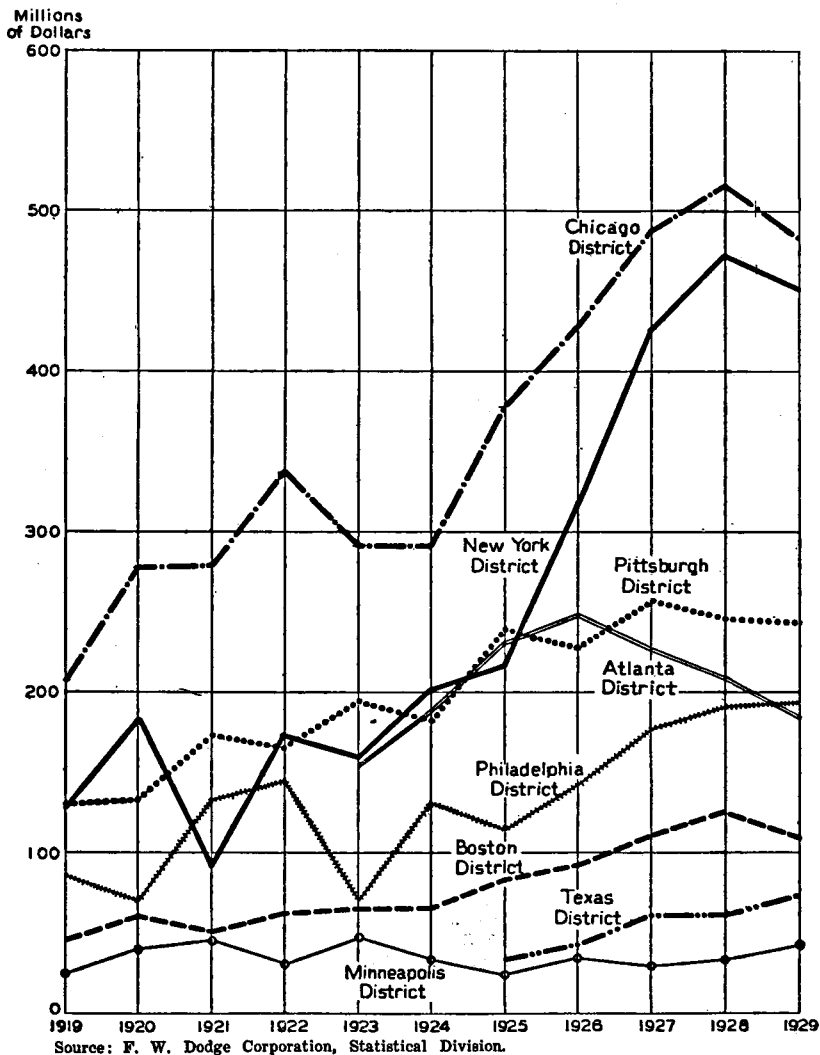
but who, as a rule, do not deposit them in any central bureau. For this reason, there is not for the construction industry in this country any satisfactory index, as suitable as those available for

CHART 17.—FLUCTUATIONS OF SELECTED TYPES OF CONSTRUCTION CONTRACTS AWARDED IN 27 STATES, MONTHLY, 1919-1929.



the manufacturing and rail transportation industries, of monthly and annual fluctuations in employment. Even the elaborate Census of Occupations of 1920 is defective in this respect in that it is difficult, because of the nature of the occupational classifications, to

**CHART 18.—TOTAL PUBLIC CONSTRUCTION CONTRACTS AWARDED  
IN SELECTED DISTRICTS OF THE UNITED STATES, 1919-1929.**



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derive a satisfactory total of the numbers employed in all branches of the construction industry.

For estimating the numbers employed in public construction, then, recourse may be had to a number of alternative methods, each equally logical or reasonable. From an examination of many sources, it would appear that the average wage and salary bill in construction enterprises of all kinds runs about 40 per cent of the value of output. For the state of Ohio very elaborate annual returns from construction industries yield the average annual earnings of employees in these industries. Dividing the total wage bill on public construction by these figures of annual earnings gives the results shown in the following tabulation:

Year	Estimated Volume of Public Construction United States (In thousands)	Estimated Total Wages Paid in Public Construction United States (In thousands)	Average Annual Earnings in All Construction in Ohio	Estimated Number Employed on Public Construction United States (In thousands)
1923	\$1,993,000	\$ 797	\$1,544	516
1924	2,500,000	1,000	1,637	611
1925	2,594,000	1,038	1,651	629
1926	2,847,000	1,139	1,611	707
1927	3,488,000	1,395	1,618	862
1928	3,599,000	1,440	1,624	887

Comparing, again, the number employed on public works in New York City with the expenditures on public construction in that city and applying this ratio to the total expenditures on public works throughout the country gives the number so employed in 1928 as slightly in excess of one million. Other estimates, made by a variety of methods, yield totals as low as 500,000 and as high as 630,000. In the absence of comprehensive continuous payroll statistics for the many divisions of the construction industry, it is impossible to reconcile these divergent estimates; but inspection of the data would appear to lead to the conclusion that somewhat more than 800,000 persons were in 1928 employed in this country in public construction.

**The Methods of Estimating the Total Volume of Public Works.**  
 —In measuring the expenditures on public works, the best sources of information are unquestionably the financial reports of the governmental agencies that do the spending. As has been pointed out before, however, the use of such sources in arriving at the

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total expenditure in the country is a task requiring considerable time and money. Under the circumstances, then, it is necessary to fall back on certain standard sources, which are themselves incomplete and inadequate but which can be employed as the basis for further estimate. The best known sources for this purpose are *Financial Statistics of States and Cities*, the record of building permits, published by the Bureau of Labor Statistics of the United States Department of Labor, the figures on contracts awarded published by the Engineering News-Record and the statistics of contracts awarded published by the F. W. Dodge Corporation. Each of these sources has its virtues and defects and it is, on the whole, quite impossible for a great variety of reasons, entirely to reconcile estimates derived from each.

1. The Financial Statistics of States and Cities.—It is almost impossible to make a reliable estimate of the aggregate volume of public construction on the basis of the figures presented in these two series of financial reports. The conclusion seems warranted that the result would be subject to so wide a margin of error as to render it almost useless or highly misleading, and of practically no value for purposes of comparison with estimates obtained by other methods. The figures of these reports are subject to the following defects:

a. They are for states and cities only, i.e. expenditures of the federal government are not included. This in itself would not be a serious shortcoming.

b. The statistics of states give figures only for each state as a governmental unit; expenditures for the counties, special districts, etc., are not ordinarily included. In other directions the counties may not spend much on public works, but in the matter of road construction at least their activities and expenditures are far from negligible.

c. The statistics of cities are only for cities of 30,000 and over. In 1927 these numbered 250 and their combined population amounted to 36 per cent of the entire population of the country. The per capita expenditure on public works in cities of less than 30,000, in towns and in villages is likely to be less than in larger cities. But undoubtedly the omission of all cities under 30,000 would seriously affect the value of the totals so obtained, and it is difficult to estimate for these cities.



d. In every case the cost of land is included along with the expenditures on construction. The Bureau of the Census in reply to inquiry in this matter indicated that it would not be possible to eliminate this element from their figures.

e. The method of tabulation employed obscures and confuses some expenditures on construction work. The greater part of the latter are to be found in the tables of "outlays on permanent improvements" (which include the cost of land in any case), but some part also, it would appear, goes into the columns for government-cost payments, though the greater part of these government-cost payments are undoubtedly for maintenance and operation rather than for construction. But because the figures of *Financial Statistics* represent "outlays" on permanent improvements, they exclude many construction expenditures not regarded as outlays. For this reason they omit a large part of what appears in the tables under the classification of highway and road expenditures—reconstruction, repairs, state-aid, resurfacing and repaving, etc., expenditures which, though they are, strictly speaking, largely for maintenance, none the less properly represent construction work. This is one of the reasons why the figures of *Financial Statistics*, which might prima facie be expected to be larger, are instead found to be consistently lower than the figures extracted from the Comptroller's reports, though the latter exclude land acquisition costs.

f. It is sometimes doubtful whether *Financial Statistics* figures for outlays include all expenditures financed from bond sales. If this doubt is justified, this might introduce a serious defect into the figures for cities such as New York, whose practice it is to finance their public works almost entirely in this manner.

g. It would appear that various state and city expenditures on construction are sometimes omitted from the *Financial Statistics* tables of outlays for no better reason than the absence in the standardized classification employed of any column into which they might properly be inserted. Thus, to cite one example, in the case of New York City, the huge expenditures on subway construction appear nowhere in the *Financial Statistics* tables. Though this is probably a quite exceptional omission, not likely to occur in the case of other cities—this type of expenditure being peculiar almost to New York City alone—it has the effect in this instance of reduc-

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ing the true total for construction in recent years roughly one-third.<sup>56</sup>

2. Building Permits.—The defects in statistics of building permits as a measure of the total volume of construction, public or private or both, may be stated as follows:

a. The specified and actual costs of the proposed project may diverge considerably.

b. Work planned may wait long for construction, and in some cases may never be executed at all.

c. Some construction work undertaken is done without any permit being obtained, though it is required.

d. For public works of certain types no building permits are customarily required.

e. The figures cover only selected cities; construction activity in these cities, as indicated by the permits to build, may or may not be good samples of the trend throughout the entire country.

f. Construction projects of the federal government are not included in the series.

g. Street paving, and some types of engineering projects, are likewise omitted.

h. The total figures are itemized according to types of construction work, but public construction is not distinguished from private.

3. Data of the Engineering News-Record.—This series, unlike the Dodge figures, covers the entire area of the United States, in-

■ The Bureau of the Census made the following comments in answer to inquiry on these points:

"The amounts shown in Table 17 of the report on financial statistics of cities, 'payments for outlays by principal divisions of governmental service,' include all payments for outlays or betterments, as defined by the Bureau of the Census, whether met from general revenue or from bond issues. Our definition of an outlay does not recognize a replacement as an outlay unless the equipment or article replaced is better than the old was when it was new. In cases of that kind, we recognize the difference between the value of the old article when new and the replaced article, and report as an outlay, the remainder to be reported as an expense. This is the definition under which all of our representatives work, and I am at a loss to explain the apparent omission or discrepancy on the part of New York City. . . . In reporting the transactions of either a state or city, we include all transactions that pass through or are under the jurisdiction or control of the state government or of the city government, and for cities, we include the transactions of independent districts, such as school, sanitary and park districts if they are practically co-extensive with a city." (L. A. Carruthers, Chief of Division, Statistics of States and Cities, in correspondence.)

**TABLE 39. — ENGINEERING CONSTRUCTION CONTRACTS AWARDED FOR PUBLIC WORKS IN THE UNITED STATES, 1919-1929\***  
(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Federal Government.....	\$72,375	\$36,562	\$28,604	\$43,556	\$47,940	\$38,885	\$34,272	\$50,262	\$50,763	\$69,815	\$103,901
Waterworks.....	19,762	22,141	38,330	36,221	62,698	61,445	69,368	61,647	53,189	99,437	48,617
Sewers.....	38,506	37,418	38,805	43,584	66,905	74,553	84,577	103,741	118,032	100,732	87,674
Streets and roads.....	225,655	262,641	313,303	334,694	361,837	415,216	421,039	484,898	525,069	615,279	539,352
Bridges (public) <sup>b</sup> .....	.....	.....	.....	.....	.....	.....	62,936	74,865	120,915	96,781	97,992
Excavations (public) <sup>b</sup> .....	.....	.....	.....	.....	.....	.....	18,256	22,466	34,677	37,734	31,570
Buildings (public) <sup>b</sup> .....	.....	.....	.....	.....	.....	.....	198,130	209,245	234,032	263,260	305,702
Unclassified (public) <sup>b</sup> .....	.....	.....	.....	.....	.....	.....	148,674	82,031	118,563	137,058	131,685
Total public engineering construction.....	\$470,355 <sup>a</sup>	\$609,230 <sup>a</sup>	\$477,405 <sup>a</sup>	\$622,637 <sup>a</sup>	\$761,616 <sup>a</sup>	\$799,716 <sup>a</sup>	\$1,037,252	\$1,089,155	\$1,255,240	\$1,420,096	\$1,346,493
Total engineering construction.....	\$1,175,888	\$1,523,075	\$1,193,512	\$1,556,592	\$1,904,040	\$1,999,290	\$2,559,443	\$2,853,842	\$3,253,766	\$3,578,580	\$3,950,315

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Source: Engineering News-Record.  
<sup>a</sup> Excludes contracts below the following values: \$15,000 for waterworks and excavations, \$25,000 for other public works, \$40,000 for industrial buildings, \$150,000 for other buildings.  
<sup>b</sup> Not separately reported in 1919-1924.  
<sup>c</sup> Estimated as 40% of total engineering construction. Public construction was 40.5% of total in 1925; 38.2% in 1926; 38.6% in 1927; 39.7% in 1928; and 34.1% in 1929.

cluding the work undertaken by the federal government. Total public and private construction are, furthermore, separated from April, 1923 onwards. For the purposes of this study, however, the series has this shortcoming, that contracts below the following minimum costs are excluded:—for water works and excavation, \$15,000; other public works, \$25,000; industrial buildings, \$40,000; other buildings, \$150,000.

In view of these omissions, it is impossible to arrive at a reliable estimate of the aggregate volume of public construction of all sorts throughout the country on the basis of this series.

The figures published by the Engineering News-Record, however, show trends not unlike those disclosed by the figures used in this study. Thus there is found in the statistics of the Engineering News-Record, summarized in Table 39, a rise in public engineering construction, from 1923 to 1928, of roughly 100 per cent.

4. Statistics of Contracts Awarded of the F. W. Dodge Corporation.—The Dodge series do not strictly represent the volume of construction work executed in any given month or year. They are not measures of current operations but rather of activity just about to be initiated. For this reason, in view of the markedly upward trend of the volume of construction in recent years, it is not surprising that the Dodge figures, representing prospective expenditures, are on the whole larger than the corresponding figures extracted from financial reports, which indicate the actual expenditures made over any given time interval. Something of the nature of the relation between the Dodge data and those taken from Comptroller's reports, as well as those from *Financial Statistics of States and Cities*, is shown in Table 40.

A time lag of unknown duration, probably varying from year to year, and certainly different in different types of work, clearly exists between the two series. Over a period of years, where averages of the two series can be directly compared, contracts awarded and actual expenditures tend to come reassuringly close. For individual years, however, the two figures are, for the reasons just explained, not comparable. Furthermore, figures for contracts let, if assumed to represent work executed, give an exaggerated impression of the amplitude of the fluctuations of the actual volume of construction work done; they tend to bunch actual expenditures if taken as an indication of them. Contracts are likely to be awarded in unusual volume during periods of brisk business ac-

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tivity, and conversely to fall off steeply during times of relative stagnation. But work initiated during rising activity is generally carried forward till completion, even after business has begun to decline; so that construction work executed tends to be subject to less violent deviations from the norm than the figures for contracts awarded would suggest.

TABLE 40.—COMPARISONS OF DIFFERENT ESTIMATES OF EXPENDITURES ON PUBLIC CONSTRUCTION BY NEW YORK STATE AND NEW YORK CITY 1919-1928

(In thousands)

YEAR	NEW YORK STATE AREA <sup>a</sup>		NEW YORK STATE GOVERNMENT <sup>b</sup>		NEW YORK CITY <sup>c</sup>		
	COMP-TROLLER'S REPORTS	F. W. DODGE CORPORATION <sup>d</sup>	COMP-TROLLER'S REPORTS	FINANCIAL STATISTICS OF STATES	COMP-TROLLER'S REPORTS	FINANCIAL STATISTICS OF CITIES	F. W. DODGE CORPORATION
1919	....	\$87,198	\$22,492	\$17,210	\$29,774	\$25,491	\$35,514
1920	....	112,597	22,886	"	39,208	"	79,520
1921	....	71,858	27,133	"	71,467	46,597	32,913
1922	....	144,890	35,925	28,282	56,635	54,592	74,252
1923	....	130,854	35,748	23,261	75,769	74,828	56,989
1924	....	165,020	43,999	31,247	120,944	124,698	68,878
1925	\$297,969	178,843	51,746	35,606	132,871	137,356	106,297
1926	312,269	252,611	54,774	37,468	131,394	97,636	148,621
1927	337,915	343,134	52,619	47,007	143,545	120,429	190,387
1928	334,263	389,385	69,374	'	132,721	'	225,876

<sup>a</sup> For Financial Statistics figures and Comptroller's Reports figures, see discussion in text, pp. 116-122.  
<sup>b</sup> See discussion in text, Chapter III pp. 64-66, and Chapter V pp. 116-122.  
<sup>c</sup> Includes educational and public buildings, hospitals and institutions, and public works and utilities (excluding railroad buildings and construction and including subways).  
<sup>d</sup> No report published for 1920.  
<sup>e</sup> Figure not given for 1921.  
<sup>f</sup> Report for 1928 not yet published.

Over a long period of years, however, contracts awarded and actual expenditures ought to come very close together, the former being only a fraction the larger of the two, to allow for average time-lag. This is exactly what is found to happen in the case of New York City in the ten year period 1919-1928, the totals being respectively \$979,069,000 and \$934,328,000. (This fact may be re-

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garded as a strong confirmation of the correctness of the Dodge figures as an index of expenditures over a period of years.) It should also be observed that there have been included in the Dodge totals for public construction contracts computed for this study some private items of a semi-public character—e.g. private hospitals—which do not figure in the Comptroller's reports.

In every case where more than one series of figures is given for state or city expenditures, the figures extracted from the Comptroller's reports are to be preferred by reason of the care and thoroughness with which they were compiled for the specific purpose in view.

Dodge figures are collected with commendable thoroughness by the field agents of the corporation, and are assembled, classified and interpreted in its statistical division. Detailed information, regularly obtained from reliable sources—public officials, contractors and above all architects, is published weekly. Since these data are compiled for profit, great care is taken that they are both accurate and up-to-date.

Dodge figures give, for the area they cover, a more comprehensive total of construction volume than any other series for building operations. Unlike the figures compiled by the Engineering News-Record, contracts below a certain minimum value are not officially excluded. They do, however, as a result of the difficulty of covering the very small items, omit most new buildings and practically all remodeling and alteration work under \$5,000 each, especially in rural districts. For the same reason they fail to include the small reconstruction and maintenance expenditures on roads, streets and highways, which in the aggregate amount to a very considerable total. Dodge figures for this class of public works thus greatly underestimate the total volume of all the varieties of work done on highways and streets.

A continuous series of contracts awarded runs back to 1919. Till 1923, however, this series covered only 27 northeastern states. In that year 9 states were added, and more recently Texas has also been included. The Pacific Coast and the Rocky Mountain states, however, are not yet covered. Estimates are made each year by the Dodge Corporation of the total volume of construction activity in the United States, but these estimates do not separate public from private construction. On the basis, however, of these figures and of other relevant data obtained from different sources, esti-

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**TABLE 41. — TOTAL CONSTRUCTION CONTRACTS AWARDED, 1919-1929**  
(In thousands)

YEAR	27 STATES <sup>a</sup>	36 STATES <sup>b</sup>	37 STATES <sup>c</sup>
1919 .....	\$2,579,881	.....	.....
1920 .....	2,564,522	.....	.....
1921 .....	2,356,244	.....	.....
1922 .....	3,343,822	.....	.....
1923 .....	3,503,726	\$3,990,483	.....
1924 .....	3,873,052	4,479,307	\$4,603,287
1925 .....	5,041,937	5,821,068	6,006,426
1926 .....	5,418,186	6,148,503	6,380,915
1927 .....	5,473,161	6,083,950	6,303,055
1928 .....	5,835,952	6,396,877	6,628,286
1929 .....	4,999,031	5,536,490	5,754,290

SOURCE: F. W. Dodge Corporation, Statistical Division.

- <sup>a</sup> The 27 states included are: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Delaware, Virginia, West Virginia, Ohio, Kentucky, Illinois, Indiana, Iowa, Wisconsin, Michigan, Missouri, Kansas, Oklahoma, Nebraska, Minnesota, North Dakota and South Dakota; also the District of Columbia.
- <sup>b</sup> The 9 additional states included in the group of 36 are: North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas and Louisiana.
- <sup>c</sup> Covers the 36 states listed above and Texas.

mates have been made for this study of the annual aggregate volume of all types of public construction throughout the country over the period 1923-1928.

**Estimate of the Total Volume of Public Construction.**— These estimates are made on the basis of the Dodge figures of reported contracts awarded, which afford the most inclusive and, for the purpose in view, the most satisfactory data available. These reported construction statistics have been corrected to cover the entire country, to include items omitted and to give proper weight to highway and bridge construction and maintenance expenditures, clearly under-represented in the Dodge figures for this class of work. The steps taken in reaching the final estimate shown in Table 42 are as follows:

- Line 1 presents the most inclusive Dodge series of recorded figures for construction contracts awarded.
- Line 2 gives the estimate for the whole country made by the Dodge Corporation, on the basis largely of the figures, in line 1, for 37 states.

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- Line 3 calculated from the detailed, classified tabulations of the figures of line 1, by the exclusion of all private construction items.
- Line 4 figures in this column are arrived at by raising figures of line 3 by the percentage that figures of line 2 are of figures of line 1. In other words, line 4 is to line 3 as line 2 is to line 1; the assumption made being that public construction in the 11 unreported states is roughly the same proportion of total construction as it is in the 37 states covered by the Dodge figures.
- Line 5 As all figures in lines 1 to 4 omit most new buildings under \$5,000 each and practically all remodeling and alteration work in rural districts, an estimate for these items is made in line 5, for the years 1923-1927, by the same method used by the Dodge Corporation in making its estimate for the year 1928.
- Line 6 This column would give a satisfactory total public construction estimate were it not for the fact that the Dodge figures greatly undervalue total road and bridge expenditures by the omission of maintenance work, and the huge volume, in the aggregate, of minor repair, reconstruction and construction items in this class.
- Line 7 This gives the estimated amounts which represented this type of work in the totals of line 6.
- Line 8 In this line the road and bridge items (estimated on the basis of Dodge figures) are taken out of the totals for public construction of line 6 (similarly estimated on the basis of Dodge figures). For it is substituted the more comprehensive figures for this class of expenditure, presented in the next two lines.
- Line 9 The Bureau of Public Roads figures for construction and maintenance of rural roads and bridges.
- Line 10 Estimates of the expenditures on construction and maintenance of city streets and bridges throughout the country, made on the basis of the sample of such expenditures by 14 representative cities covered by the Dodge records. (The estimates allow for maintenance, repair and reconstruction work.)
- Line 11 represents the sum of lines 8-10 and should give a true estimate of the aggregate volume of public construction of



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all types throughout the country than has been made hitherto. It is not possible to carry these estimates back before 1923, since the Bureau of Public Roads figures are not available for earlier years, and because only 27 states are covered by the Dodge figures prior to 1923.

TABLE 42. — ESTIMATED TOTAL PUBLIC CONSTRUCTION IN UNITED STATES, 1923-1928

(In millions)

TYPE	1923	1924	1925	1926	1927	1928
1. Total construction 37 states * . . .	\$3,990	\$4,479	\$6,006	\$6,381	\$6,303	\$6,628
2. Total construction, United States <sup>b</sup> . . . . .	4,768	5,237	6,623	6,901	6,787	7,065
3. Public construction 37 states * . .	1,002	1,121	1,335	1,460	1,689	1,751
4. Public construction contracts of \$5000 and over, United States <sup>b</sup>	1,192	1,312	1,469	1,577	1,824	1,874
5. Public construction contracts less than \$5000 plus reconstruction and remodeling, United States * . . . . .	288	314	347	394	456	463
6. Total public construction, United States <sup>c</sup> . . . . .	\$1,480	\$1,626	\$1,816	\$1,971	\$2,280	\$2,337
7. Streets, roads and bridges, United States <sup>b</sup> . . . . .	481	472	564	682	833	860
8. Total public construction, minus streets, roads and bridges . . . .	999	1,154	1,252	1,289	1,447	1,477
9. Rural roads and bridges, construction and maintenance * . .	784	934	968	956	1,066	1,237
10. City streets and bridges, construction and maintenance <sup>f</sup> . . .	210	412	374	602	975	885
11. Estimate of total public construction, United States * . . . .	\$1,993	\$2,500	\$2,594	\$2,847	\$3,488	\$3,599

\* The figures are taken from the F. W. Dodge Corporation. In 1923 and 1924 the figures cover 36 states.  
<sup>b</sup> Estimated on basis of F. W. Dodge Corporation figures.  
<sup>c</sup> Estimated on basis of 1928 F. W. Dodge Corporation figures.  
<sup>d</sup> Sum of items 4 and 5.  
<sup>e</sup> Figures taken from United States Department of Agriculture, Bureau of Public Roads.  
<sup>f</sup> Estimated on basis of F. W. Dodge Corporation figures for 14 cities.  
<sup>g</sup> Sum of items 8, 9 and 10. Bureau of Public Roads' figures for rural roads and bridges, construction and maintenance have been substituted for the Dodge figures of streets, roads and bridges because they are more inclusive.

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**Estimate of Total Volume of Public and Private Construction.**  
 —It is of interest to have an idea of the proportion public construction has been of all construction in the country in recent years. In Table 43 an estimate has been made of the total volume of combined public and private construction of all kinds from 1923 to 1928, and compared with the volume of public construction alone during this period. This estimate was arrived at by the same procedure as that used in estimating the total value of

TABLE 43. — ESTIMATED TOTAL PUBLIC AND PRIVATE CONSTRUCTION IN UNITED STATES, 1923-1928

(In millions)

YEAR	DODGE FIGURES OF TOTAL CONSTRUCTION 37 STATES *	DODGE ESTIMATE OF TOTAL CONSTRUCTION UNITED STATES	ESTIMATED TOTAL PUBLIC AND PRIVATE CONSTRUCTION UNITED STATES	ESTIMATED TOTAL PUBLIC CONSTRUCTION UNITED STATES	PER CENT PUBLIC IS OF TOTAL CONSTRUCTION UNITED STATES
1923	\$3,990	\$4,768	\$6,368	\$1,993	31.3
1924	4,479	5,237	7,305	2,500	34.2
1925	6,006	6,623	8,911	2,594	29.1
1926	6,381	6,901	9,350	2,847	30.4
1927	6,303	6,787	9,542	3,488	36.6
1928	6,628	7,065	9,936	3,599	36.2

\* In 1923 and 1924 the amounts given are for 36 states.

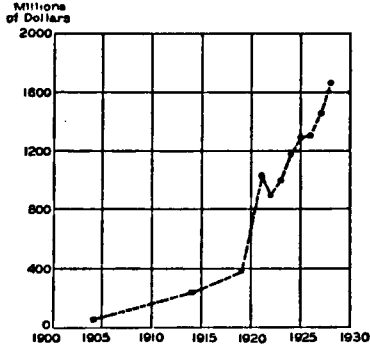
public construction. Column 1 presents, as in Table 42, the most inclusive Dodge series of recorded figures for construction contracts awarded; Column 2 gives the estimates for the whole country made by the Dodge Corporation on the basis largely of the figures of Column 1. Both these columns omit most new buildings under \$5,000 each and much remodeling and alteration work; they also greatly undervalue total road and bridge expenditures, as explained above. These omissions have been fully rectified by the same means as were used in making the public construction estimates, in computing the figures of Column 3.

## CHAPTER VI

### ROAD BUILDING

The cost of constructing and maintaining roads, streets and bridges in the United States now amounts to about 40 per cent of the total expenditures in the country on public works. Highway building of the modern type, an outgrowth of the radical revolution in transportation arising out of the perfection of the automobile has thus come to be one of the major forms of public permanent improvements. In 1904 the total state and local road and bridge disbursements amounted only to \$59,500,000; by 1914 the sum had risen to over \$240,000,000; and in 1928 to nearly \$1,660,000,000.<sup>57</sup>

CHART 19.—TOTAL STATE AND LOCAL ROAD AND BRIDGE DISBURSEMENTS THROUGHOUT THE UNITED STATES, 1904-1928.

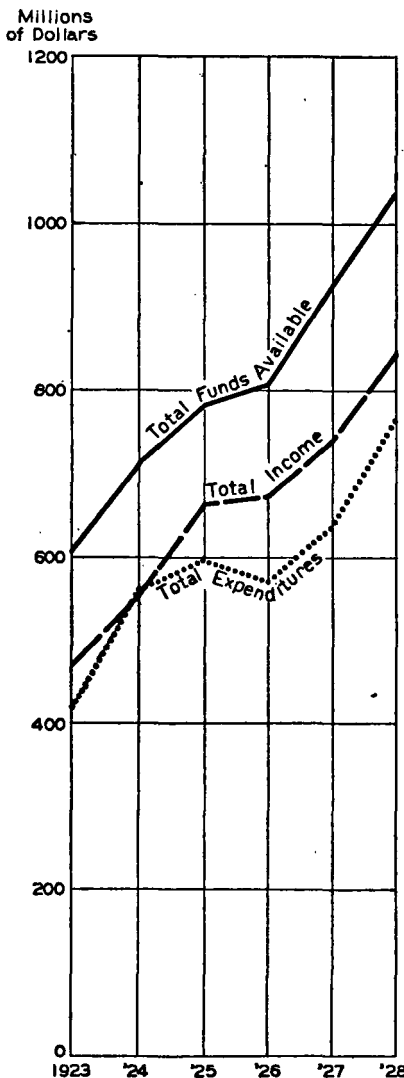


Source: United States Department of Agriculture, Bureau of Public Roads.

Actual expenditures for the construction and maintenance of bridges and roads, not including various overheads and the cost of equipment and materials, rose in the period 1923-1928 from \$784,000,000 in 1923 to more than \$1,237,000,000 in 1928. The an-

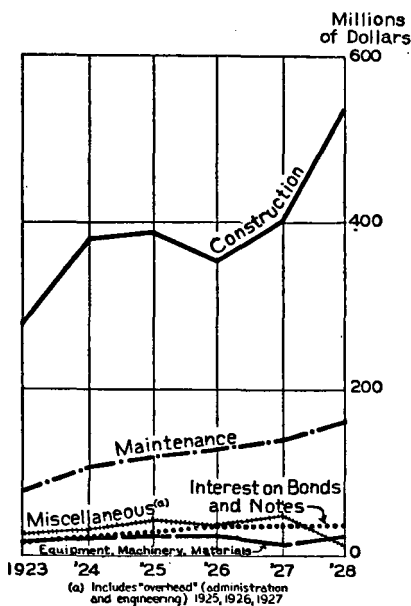
<sup>57</sup> United States Department of Agriculture, Bureau of Public Roads.

**CHART 20.—TOTAL INCOME, FUNDS AVAILABLE AND EXPENDITURES FOR STATE HIGHWAYS AND BRIDGES THROUGHOUT THE UNITED STATES, 1923-1928.**

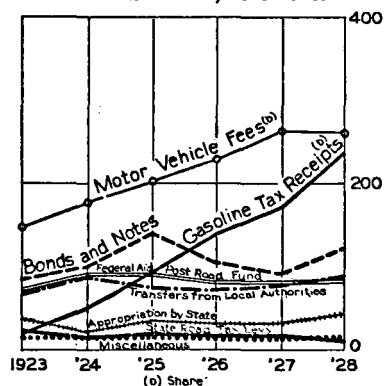


Source: United States Department of Agriculture, Bureau of Public Roads.

**CHART 21.—PURPOSES OF EXPENDITURES FOR STATE HIGHWAYS AND BRIDGES IN THE UNITED STATES, 1923-1928.**

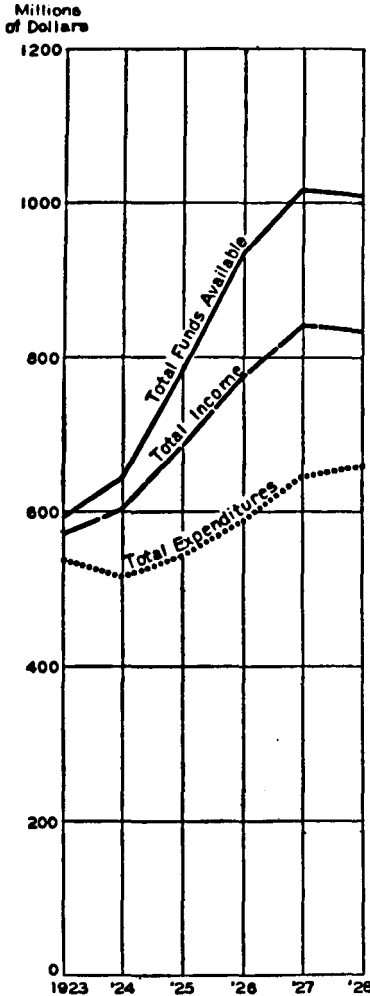


**CHART 22.—SOURCES OF FUNDS AVAILABLE FOR STATE HIGHWAYS AND BRIDGES IN THE UNITED STATES, 1923-1928.**



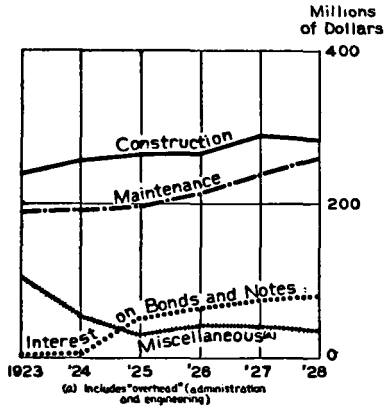
Source: United States Department of Agriculture, Bureau of Public Roads.

**CHART 23.—TOTAL INCOME, FUNDS AVAILABLE AND EXPENDITURES FOR LOCAL HIGHWAYS AND BRIDGES THROUGHOUT THE UNITED STATES, 1923-1928.**



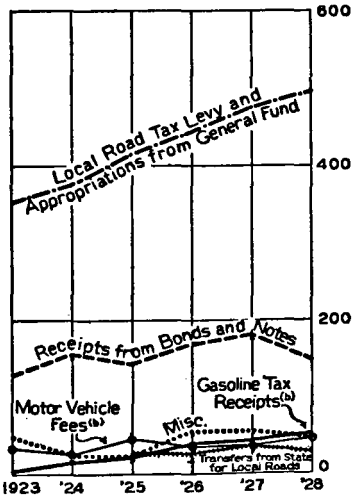
Source: United States Department of Agriculture, Bureau of Public Roads.

**CHART 24.—PURPOSES OF EXPENDITURES FOR LOCAL HIGHWAYS AND BRIDGES IN THE UNITED STATES, 1923-1928.**



(a) Includes "overhead" (administration and engineering)

**CHART 25.—SOURCES OF FUNDS AVAILABLE FOR LOCAL HIGHWAYS AND BRIDGES IN THE UNITED STATES, 1923-1928.**



(a) Share

Source: United States Department of Agriculture, Bureau of Public Roads.

TABLE 44. — INCOME AND FUNDS AVAILABLE FOR STATE HIGHWAY AND BRIDGE WORK, 1923-1928\*

SOURCE OF INCOME	1923	1924	1925	1926	1927	1928
State road tax levy . . . . .	\$24,348,478	\$18,282,878	\$21,489,004	\$18,278,994	\$18,769,561	\$11,955,782
Appropriation by state . . . . .	37,461,579	20,084,324	33,390,642	29,868,048	30,794,645	42,468,386
State share of motor vehicle fees . . . . .	147,075,966	174,816,973	199,845,163	224,551,631	259,854,786	259,134,820
State share of gasoline tax receipts . . . . .	15,872,884	47,810,615	89,328,340	134,303,154	169,818,473	234,163,826
Receipts from bonds and notes . . . . .	88,186,784	101,653,327	141,402,022	103,846,301	90,979,230	121,483,599
Federal Aid Post Road Fund . . . . .	72,343,401	91,400,832	92,180,406	79,163,201	80,459,671	80,798,365
Transfers from local authorities . . . . .	66,753,265	87,998,486	71,737,028	69,973,570	76,639,189	86,709,904
Miscellaneous income . . . . .	15,498,492	13,349,610	15,051,966	13,223,531	12,469,703	12,611,916
<b>Total income . . . . .</b>	<b>\$467,540,849</b>	<b>\$555,397,045</b>	<b>\$664,424,571</b>	<b>\$673,208,430</b>	<b>\$739,785,258</b>	<b>\$849,326,598</b>
Balance from previous year . . . . .	138,834,354	156,826,702	115,656,721	133,479,178	182,714,171	186,159,876
<b>Total funds available . . . . .</b>	<b>\$606,375,203</b>	<b>\$712,223,747</b>	<b>\$780,081,292</b>	<b>\$806,687,608</b>	<b>\$922,499,429</b>	<b>\$1,035,486,474</b>

Sources: United States Department of Agriculture, Bureau of Public Roads, *Tables F-1*, 1923-1928.

\* Under supervision of State Highway Departments.

TABLE 45. — INCOME AND FUNDS AVAILABLE FOR LOCAL HIGHWAY AND BRIDGE WORK, 1923-1928

Source of Income	1923	1924	1925	1926	1927	1928
Local road tax levy . . . . .	\$354,227,471	\$376,787,861	\$412,825,227	\$357,263,356	\$405,219,774	\$416,812,566
Appropriations from general fund . . . . .						
Local share of motor vehicle fees . . . . .	35,717,942	26,856,176	46,545,445	37,861,018	40,239,856	50,433,055
Local share of gasoline tax receipts . . . . .	4,137,401	16,971,402	24,833,979	39,733,227	46,860,508	53,778,852
Receipts from bonds and notes . . . . .	128,782,373	157,536,944	144,413,116	168,575,423	181,080,953	150,222,357
Transfers from State for local roads . . . . .	.....	.....	30,433,841	29,964,569	37,984,351	30,997,475
Miscellaneous income . . . . .	48,284,360	24,214,559	23,966,034	56,242,683	56,535,744	51,133,653
Total income . . . . .	\$571,149,547	\$602,366,942	\$683,017,642	\$775,423,682	\$840,613,923	\$835,326,951
Balance from previous year . . . . .	21,907,045	43,917,320	97,895,087	158,278,223	178,107,618	172,897,145
Total funds available . . . . .	\$593,056,592	\$646,284,262	\$780,912,729	\$933,701,905	\$1,018,721,541	\$1,008,224,096

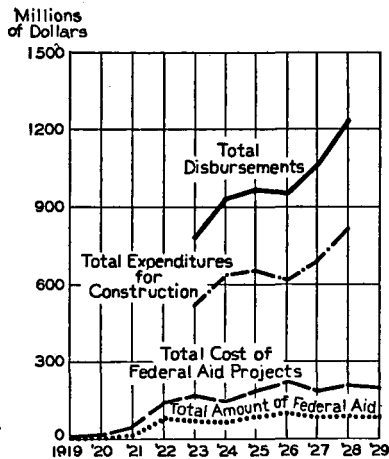
Source: United States Department of Agriculture, Bureau of Public Roads, Tables F-4, 1923-1928.

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nual cost of maintenance, alone, is now rapidly approaching \$500,000,000.

The procedure involved in road building and the methods of financing employed by federal, state and local governments have already been described.<sup>58</sup> The variety of the sources of income available for state and local highway and bridge construction is shown in Tables 44 and 45. The greater part of the funds for state

CHART 26.—TOTAL FEDERAL AID FOR ROAD CONSTRUCTION COMPARED WITH TOTAL COST OF SUCH PROJECTS AND WITH TOTAL ROAD AND BRIDGE EXPENDITURES OF ALL KINDS, 1919-1929.



Source: United States Department of Agriculture, Bureau of Public Roads.

highways are raised out of current revenues, of which the largest shares come from motor vehicle fees and from gasoline tax receipts. In 1928 nearly \$500,000,000, out of total funds of \$1,035,000,000 available for state highway and bridge construction and maintenance, came from motor vehicle fees and gasoline tax receipts. Gasoline tax receipts for state roads were a negligible factor in 1923, yielding then less than \$16,000,000; but by 1926 returns from this source had mounted to over \$134,000,000. In the building of local highways and bridges local road tax levies are the largest single source of income, amounting to more than 40 per cent of the total funds available in 1928. The federal grants have amounted to

<sup>58</sup> Chapters III and IV.



TABLE 46. — MILEAGE AND COST OF FEDERAL AID ROADS, 1919-1929

YEAR	MILES										Cost	
	Graded and Drained	Sand and Clay	Gravel	Water-sound Macadam	Bituminous Macadam	Bituminous Concrete	Portland Cement Concrete	Brick	Bridges	Total Miles	Amount of Federal Aid	Total Cost
1919	10.0	46.8	55.2	...	1.2	19.5	25.2	18.8	0.2	176.8	\$ 768,472	\$ 2,124,873
1920	203.0	90.0	247.8	11.7	11.0	19.7	110.3	21.8	0.9	716.1	3,159,791	7,405,001
1921	349.9	384.2	1,290.0	40.5	148.9	159.1	494.6	26.8	4.2	2,898.5	18,462,090	42,149,181
1922	1,635.5	1,111.8	3,445.3	286.8	294.5	392.8	2,126.9	205.6	20.0	9,519.3	79,654,073	188,505,292
1923	1,966.0	1,016.7	4,404.0	287.5	468.1	131.0	1,621.4	69.0	10.3	9,973.9	71,360,084	166,149,032
1924	2,365.2	805.8	3,463.4	238.6	601.0	210.6	1,292.0	166.8	12.3	9,155.7	63,053,169	140,227,611
1925	1,824.4	729.9	3,328.8	117.3	624.8	244.0	2,431.6	122.5	22.2	9,445.5	85,605,264	186,003,066
1926	2,159.5	663.3	4,037.3	74.0	790.0	255.7	2,536.6	74.7	37.1	10,628.3	97,619,261	219,434,547
1927	2,558.1	612.1	3,299.1	157.4	488.3	198.6	2,284.1	39.8	45.9	9,683.4	81,330,358	182,770,090
1928	2,196.5	1,241.4	2,591.1	126.3	645.3	164.5	3,130.4	48.2	54.6	10,198.3	88,056,984	205,043,784
1929	2,290.6	662.8	2,324.5	118.6	552.1	212.0	3,134.5	47.8	47.1	9,390.0	82,736,879	195,298,168

Source: United States Department of Agriculture, Bureau of Public Roads.

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\$75,000,000 a year; but Congress, in April, 1930, passed a bill raising the federal annual appropriation to \$125,000,000 in 1931, 1932 and 1933.

The federal aided system on June 30, 1929, comprised a total of 188,857 miles of main interstate and intercounty highways. At the close of the fiscal year 1929, the actual length of roads improved with federal aid was 78,097 miles, or 41 per cent of the total mileage.

Among the many projects of public construction whose schedules have been accelerated during the last months of 1929, road and bridge building is likely to show the largest increase when the final records for 1930 become available. Elaborate preliminary estimates made by the Bureau of Public Roads would appear to indicate that total expenditures on roads and bridges during 1930 will exceed the outlays of the preceding year by more than a quarter of a billion dollars.

## CHAPTER VII

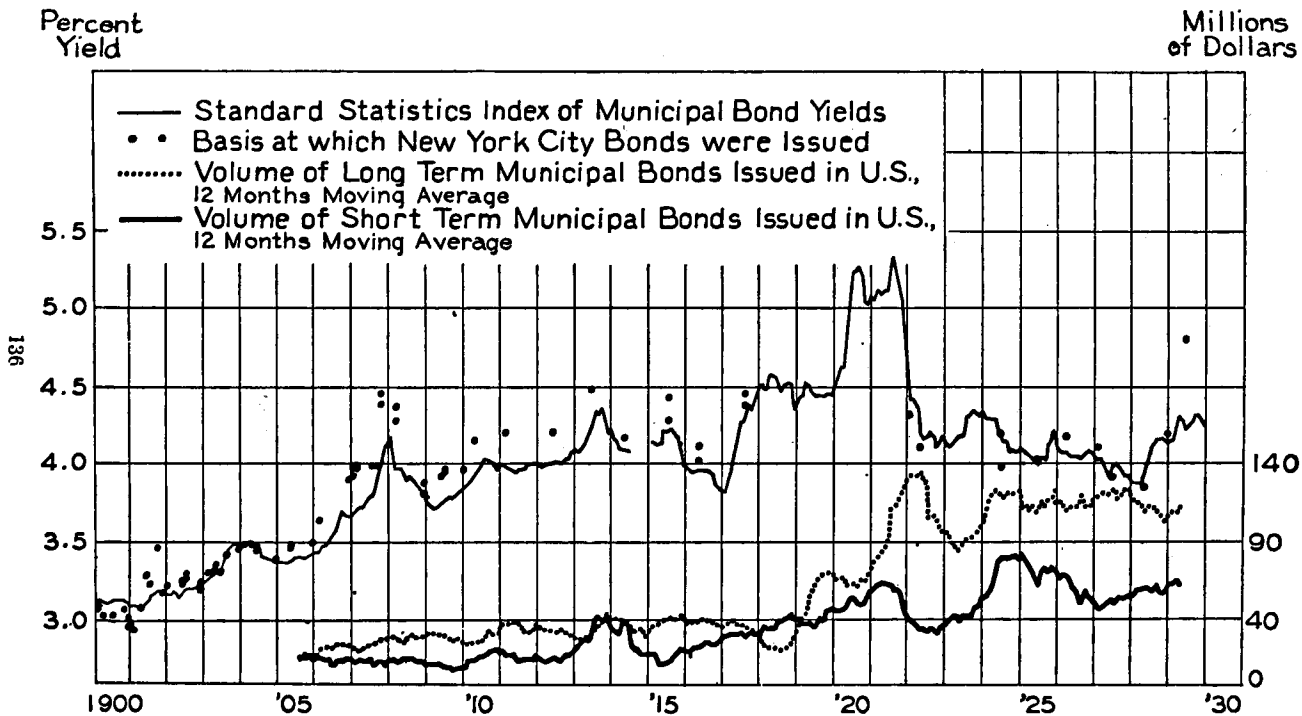
### THE FINANCING OF PUBLIC CONSTRUCTION

Public construction, in this country and elsewhere, is paid for out of current revenue and out of the proceeds of long and short-term borrowings. The scale of permanent public improvements prevailing at any time, therefore, is not alone determined by the needs of the community or by its plans, but is subject, also, to the influence of other factors of equal importance. The rate of taxation, as is well known, is often limited by the capacity and willingness of citizens to pay; and the volume of contemplated loans is on occasion fixed by constitutional limitations on borrowing capacity or by the state of the money market. In this regard there is a marked analogy between a public agency, planning to initiate a program of permanent improvements, and a private business enterprise, contemplating improvements and additions to its plant and equipment, which depends for its capital on its net income and its ability to borrow.

The record of municipal bond flotations in this country indicates a persistent relation between money rates and the amount of such bond issues. In periods of tight money, when the price which governments are required to pay for their credit is high, there is a tendency to shift from long to short-term loans and to reduce the total volume of borrowings until such time as money rates have eased. Occasionally, under the stress of critical conditions of war, a municipality may cease nearly all borrowing for the time being, as in the case of New York City. The prevailing relation between the yields of standard municipal bonds and the volume of long and short term bond issues is shown for the period since 1900 in Appendix I, Tables 1 and 2, and in Chart 27.

During the past two years of rising money rates, the condition of tight money was reflected in the changing level of the amount of municipal loans. Thus, the total of municipal loans for new financing dropped from \$1,151,784,994 in the first nine months of 1927, to \$962,103,769 in 1928, and to \$918,079,139 in 1929. With

CHART 27.—MUNICIPAL BOND YIELDS AND MUNICIPAL BOND ISSUES IN THE UNITED STATES, 1900-1929.



## THE FINANCING OF PUBLIC CONSTRUCTION 137

the sudden easing of money rates in November, 1929 and the subsequent rise in bond prices, public financing hitherto withheld came upon the market and produced a substantial rise in the volume of new flotations. The following tabulation of permanent state and municipal borrowing shows that the amount issued in December, 1929 was greater than in the same month of any year since 1920, excepting 1921, and that the total for 1929 now exceeds the issues during 1928, but is slightly below the volume of loans in 1927.<sup>59</sup>

Year	December	12 Months Ending December 31
1920	\$ 81,556,865	\$ 773,663,986
1921	313,745,876	1,383,369,900
1922	53,497,002	1,279,553,134
1923	97,346,640	1,135,167,134
1924	73,600,315	1,446,688,993
1925	166,272,700	1,404,702,240
1926	147,246,926	1,362,037,801
1927	117,903,228	1,477,769,824
1928	116,140,540	1,389,818,718
1929	273,377,311	1,443,008,693

The annual issues of municipal bonds are not a proper measure of the net increase in the amount of bonds outstanding. While practice differs materially from state to state and city to city, bonds everywhere mature or are redeemed by the sinking fund or serial bond methods. The volume of maturities and redemptions, the gross annual new issues and the net annual increase in the amounts outstanding are shown in Table 47.

**Purposes of Bond Issues.**—The survey of contracts awarded for public construction and of the expenditures for this purpose by several selected municipalities, considered earlier in this book,<sup>60</sup> revealed considerable variation in categories of public works expenditures from year to year. Street improvement, water supply, schools and other public buildings, however, always loom large in the total. These findings are confirmed by the classification of municipal bond issues from 1924 to 1928, given in Table 48.

<sup>59</sup> *The Daily Bond Buyer*, New York City.

<sup>60</sup> Chapters I and II, pp. 11-15, 18-21, 27-34.

TABLE 47. — NET ANNUAL INCREASE IN AMOUNT OF MUNICIPAL BONDS OUTSTANDING, IN THE UNITED STATES, 1914-1928

(In millions)

YEAR	GROSS AMOUNT NEW ISSUES	AMOUNT OF BONDS MATURED AND REDEEMED	NET ANNUAL INCREASE IN AMOUNT OF BONDS OUTSTANDING
1914.....	\$446	\$275	\$171
1915.....	492	172	320
1916.....	497	121	376
1917.....	444	135	309
1918.....	262	68	194
1919.....	762	317	445
1920.....	773	263	510
1921.....	1,383	431	952
1922.....	1,279	672	607
1923.....	1,135	390	745
1924.....	1,446	228	1,218
1925.....	1,404	544	860
1926.....	1,362	713	649
1927.....	1,464	572	892
1928.....	1,389	482	907

Source: The Bond Buyer, *Municipal Bond Sales*, Annual Edition, New York City, 1928, p. 6.

TABLE 48. — PURPOSE OF MUNICIPAL BOND ISSUES IN THE UNITED STATES, 1924-1928

(In thousands)

PURPOSE	1924	1925	1926	1927	1928
Water supply.....	\$120,064	\$105,864	\$104,950	\$95,459	\$62,173
Schools.....	57,799	120,591	59,556	83,802	56,624
Sewers.....	46,094	69,243	54,479	59,804	50,285
Street improvement.....	90,979	112,587	99,543	114,753	114,534
Public utilities.....	34,924	24,247	60,022	107,712	76,208
Parks.....	14,243	8,826	7,431	6,375	20,532
Public Buildings, Hospitals, Police and Fire Departments.....	53,900	28,674	42,085	46,968	41,031
Miscellaneous.....	310,133	228,482	283,514	243,930	219,136

Source: The Bond Buyer, *Municipal Bond Sales*, Annual Edition, New York City.

**CHART 28.—NET ANNUAL INCREASE IN AMOUNT OF MUNICIPAL BONDS OUTSTANDING IN THE UNITED STATES, 1914-1928.**

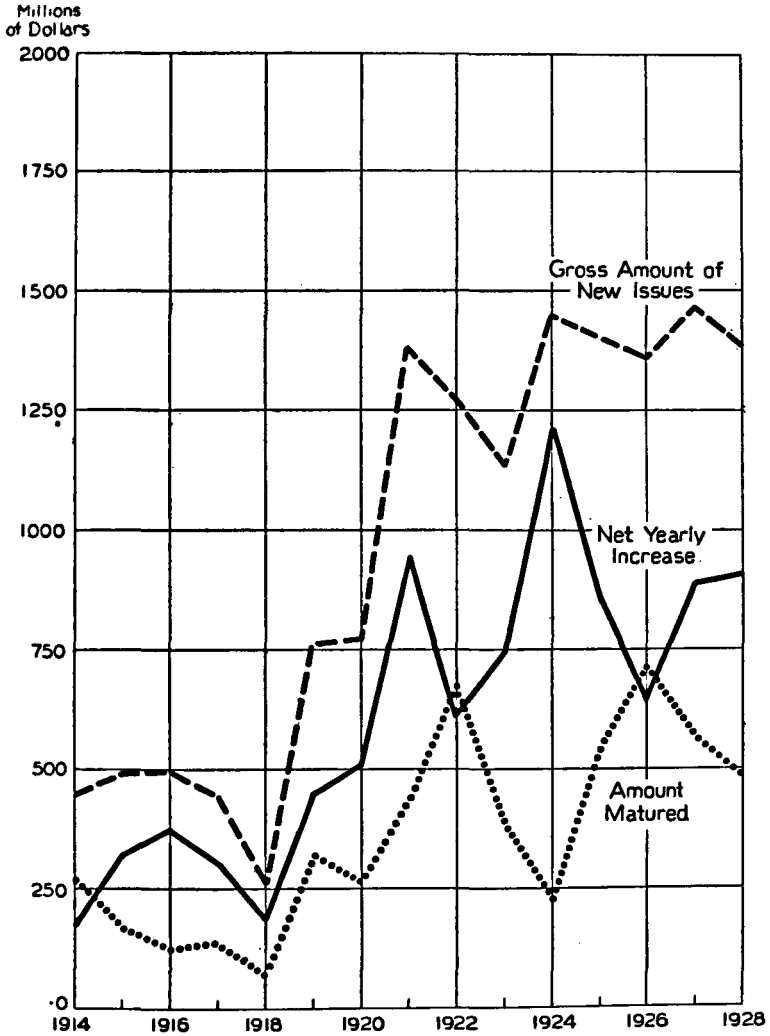


CHART 29.—PURPOSE OF MUNICIPAL BOND ISSUES IN THE UNITED STATES, 1924-1928.

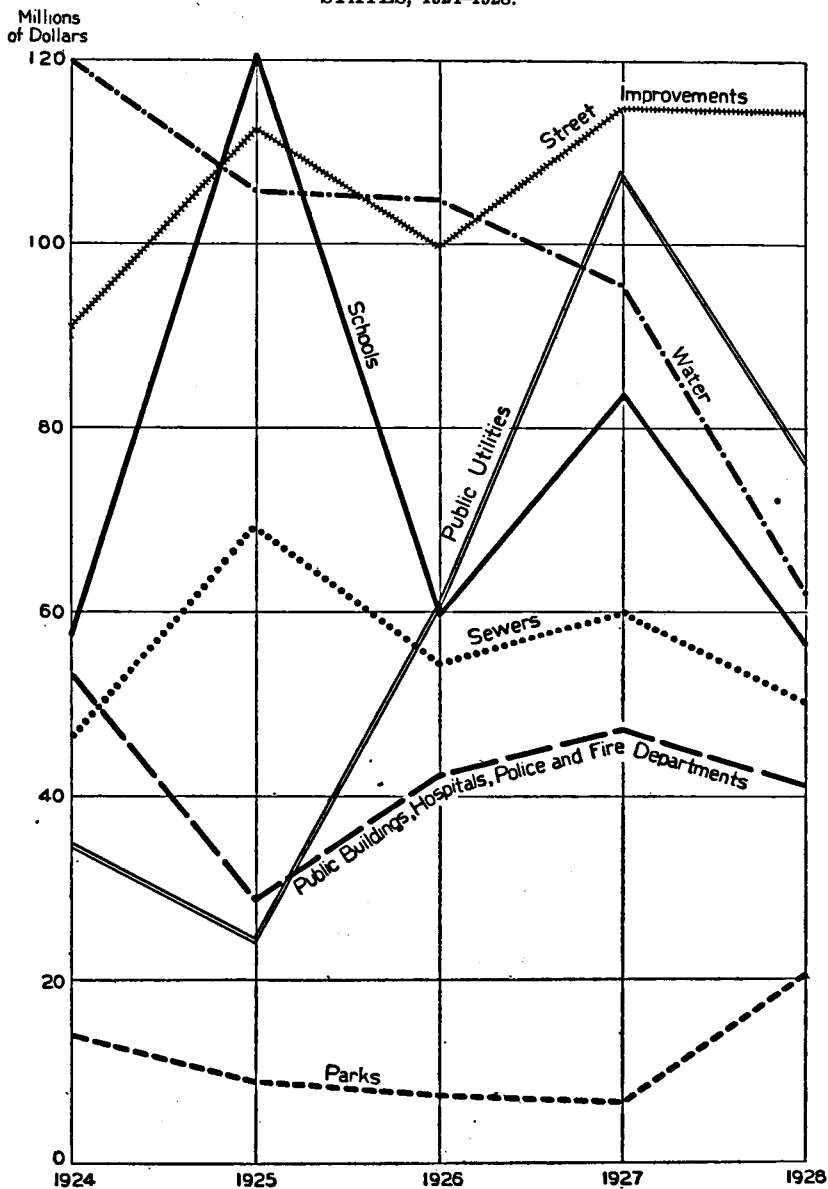
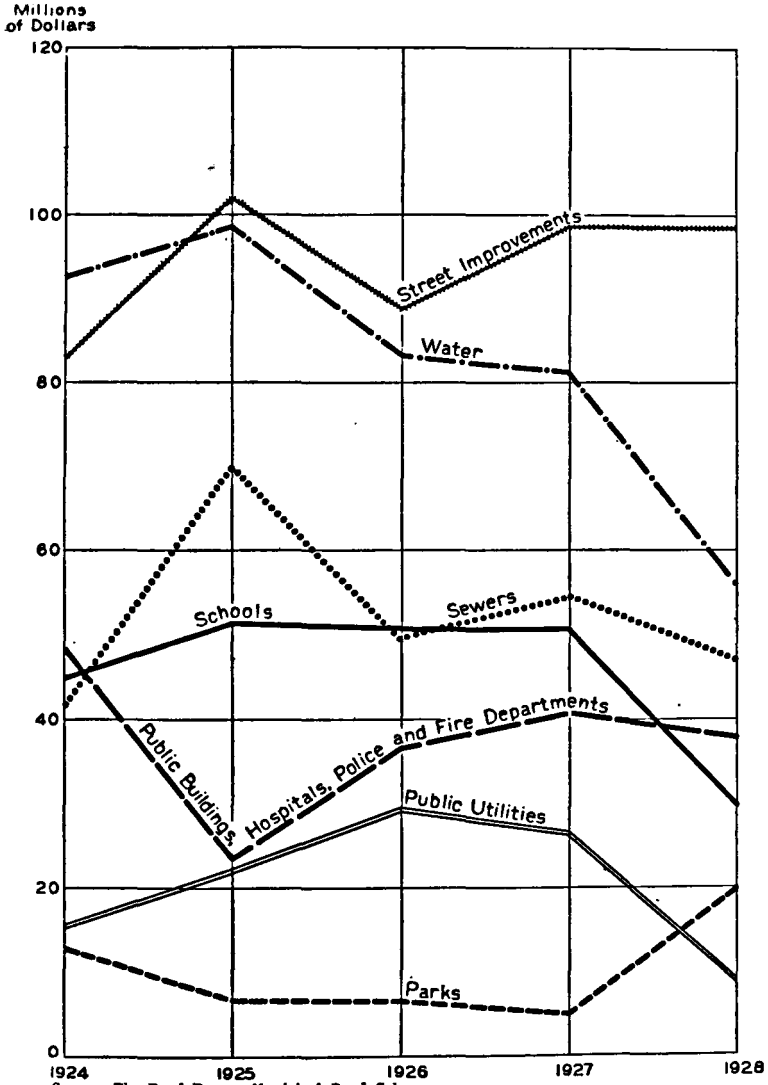




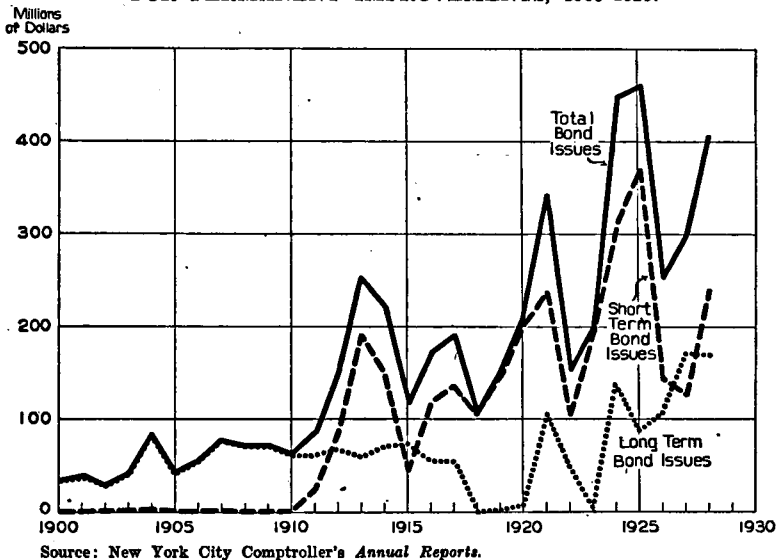
CHART 30.—PURPOSES OF MUNICIPAL BOND ISSUES THROUGHOUT THE UNITED STATES, EXCLUDING MUNICIPALITIES IN NEW YORK STATE, 1924-1928.



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**Municipal Tax Receipts and Bond Issues.**—The problem of the sound method of financing permanent improvements and the other activities of government has long been a subject of discussion in this country with reference to the operation of federal, state and local governments. The adoption of the pay-as-you-go policy by New York City during the war period and the abandonment of that policy later is by no means an uncommon experience. While

CHART 31.—YEARLY VOLUME OF BONDS ISSUED BY NEW YORK CITY FOR PERMANENT IMPROVEMENTS, 1900-1929.



there are exceptions to the rule, it is still the condition in the United States that the financing of public construction, except in road building, where income has come more and more out of current revenues, is done by means of long-term loans and the use of short-term issues in anticipation of later long-term borrowings. Table 49, which is a summary of the tax receipts and new bond issues of American municipalities, does not indicate the use of the tax receipts and the proceeds of bond sales, but it shows how income from these two sources has increased *pari passu*.

In general the growing cities of the country show huge increases

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in income from both sources.<sup>61</sup> Thus Detroit, Michigan, had in 1910 tax receipts of over \$6,000,000, and bonds issued in that year, exclusive of Water Commission and Street Railway bonds, amount-

**TABLE 49. — TAX RECEIPTS AND NEW BOND ISSUES OF AMERICAN CITIES, 1905-1929**

(In millions)

YEAR	ALL TAX RECEIPTS OF CITIES HAVING POPULATION <sup>a</sup> 30,000 AND OVER	AMOUNT OF LONG TERM BONDS ISSUED <sup>b</sup>	AMOUNT OF SHORT TERM BONDS ISSUED <sup>b</sup>	TOTAL AMOUNT NEW BONDS <sup>b</sup>
1905.....	\$357	\$198	\$150	\$348
1906.....	377	301	125	426
1907.....	403	301	168	469
1908.....	444	355	175	530
1909.....	472	364	118	482
1910.....	525	324	197	522
1911.....	553	452	191	643
1912.....	583	339	192	591
1913.....	597	408	483	892
1914.....	619.5 <sup>c</sup>	446	292	738
1915.....	642	493	155	647
1916.....	695	497	292	790
1917.....	742	445	392	837
1918.....	791	263	473	736
1919.....	875	770	450	1,220
1920.....	897 <sup>c</sup>	774	664	1,438
1921.....	919	1,383	762	2,145
1922.....	1,441	1,280	396	1,675
1923.....	1,485	1,135	514	1,649
1924.....	1,617	1,447	979	2,426
1925.....	1,736	1,405	866	2,271
1926.....	1,901	1,362	661	2,023
1927.....	2,047	1,478	625	2,103
1928.....	....	1,390	717	2,107
1929 (11 mos.)...	....	1,163	816	1,980

<sup>a</sup> United States Bureau of the Census, *Financial Statistics of Cities*.

<sup>b</sup> The Bond Buyer, *Municipal Bond Sales*, Annual Edition, New York City.

<sup>c</sup> Interpolated figures.

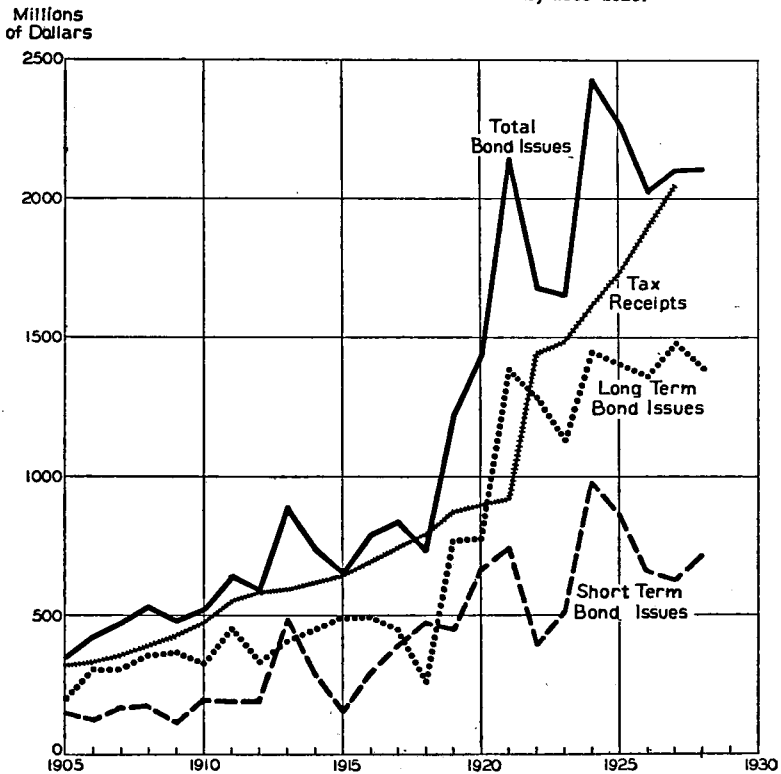
ing to only \$365,000. In 1929 the tax levy of Detroit was more than \$76,000,000 and the bonds issued, including water bonds, nearly \$20,000,000. Tax receipts in Los Angeles, likewise, rose from

<sup>a</sup> See Appendix I, Tables 3A and 3B.

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\$4,100,000 in 1910 to \$29,500,000 in 1928; and bond issues from \$5,740,000 in 1910 to \$13,171,000 in 1929, although a peak in bond issues was reached in 1925, when the amount issued was in excess of \$36,000,000. The experience of New York City in this regard

CHART 32.—YEARLY AMOUNT OF BOND ISSUES AND TAX RECEIPTS OF CITIES IN THE UNITED STATES, 1905-1929.



has already been described. In some cities, notably Boston, Massachusetts, tax receipts are commonly far greater than bond issues. In the years 1926, 1927 and 1928, the tax receipts of Boston were more than \$75,000,000 a year, while bond issues averaged annually less than \$10,000,000. The financing of the operations of Chicago, also, until the difficult condition of 1929 when borrowings rose above \$84,000,000, appears to have been derived largely from

**CHART 33.—COMPARISON OF TAX RECEIPTS AND LONG TERM BOND ISSUES OF SELECTED CITIES, 1900-1929.**

— Tax Receipts      ..... Bond Issues

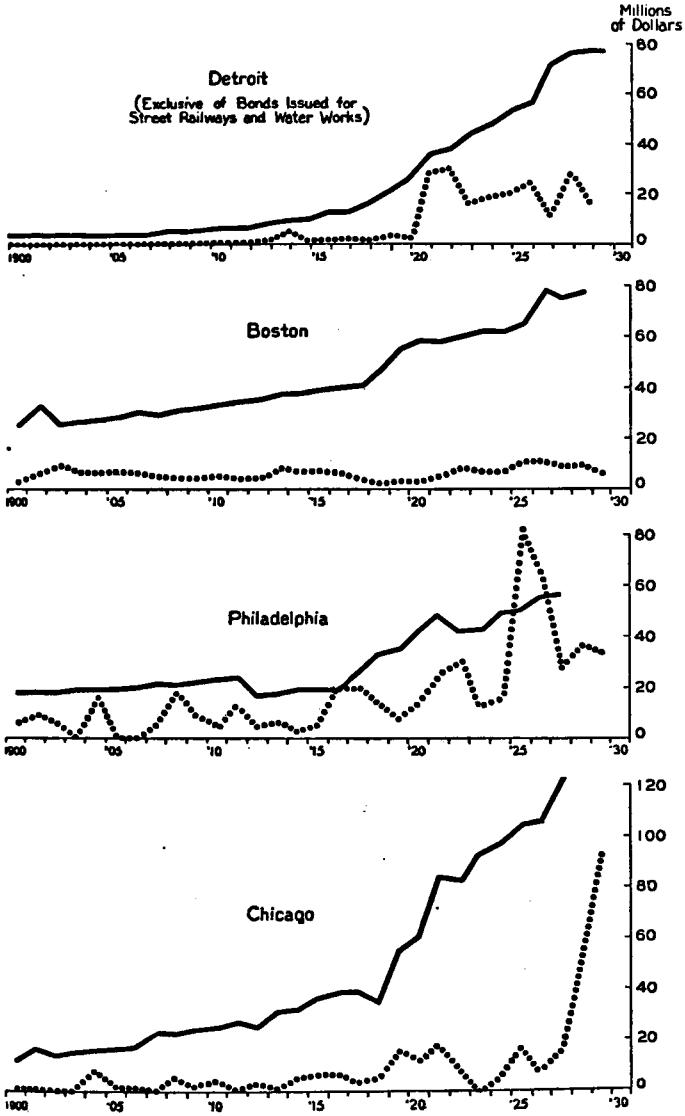
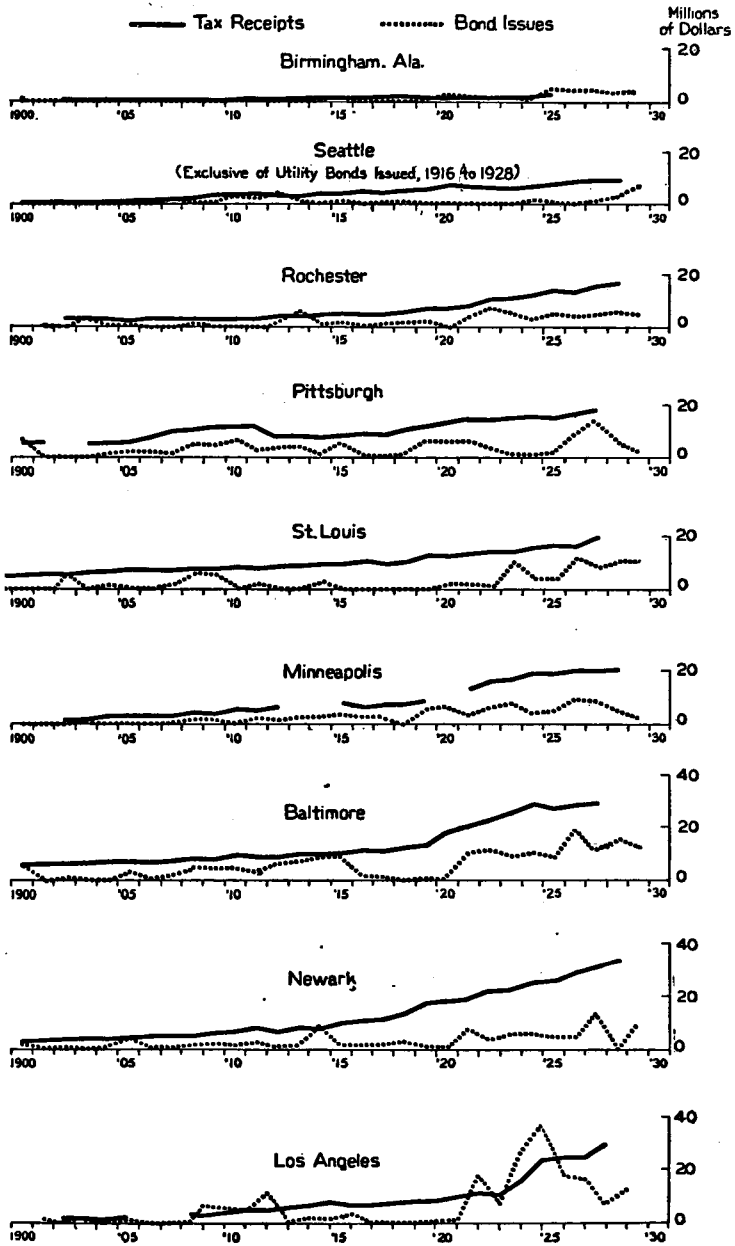
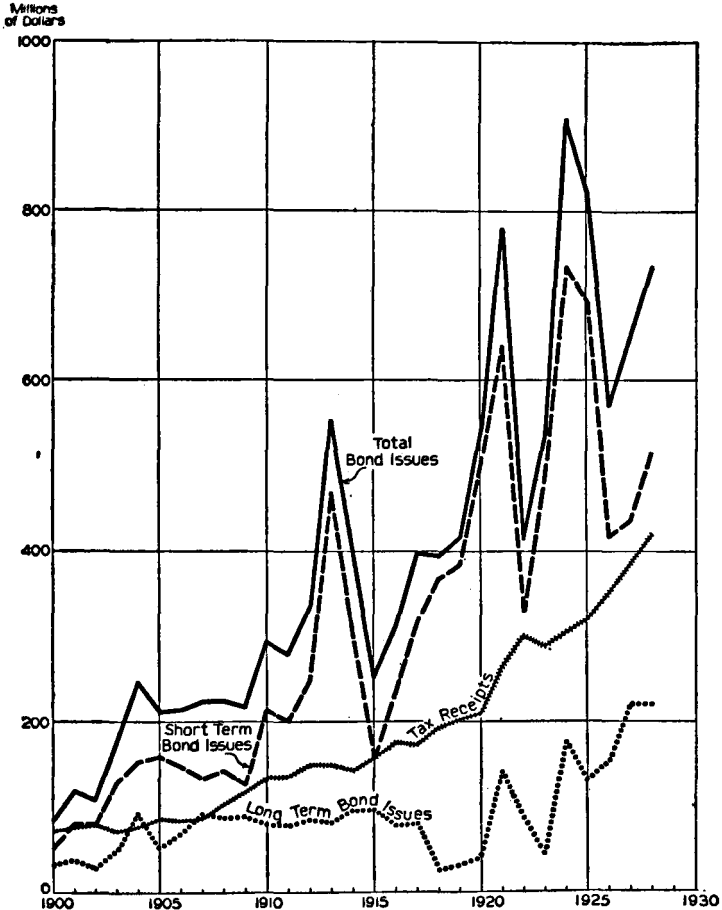


CHART 33.—COMPARISON OF TAX RECEIPTS AND LONG TERM BOND ISSUES OF SELECTED CITIES, 1900-1929.—Continued



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CHART 34.—COMPARISON OF TAX RECEIPTS AND BOND ISSUES FOR ALL PURPOSES OF NEW YORK CITY, 1900-1928.



current tax revenues. The trend in the financing of roads, where the cost has come increasingly out of various forms of taxes, has already been described in Chapter VI.

**Constitutional Debt Limits.**—Practically all local governments in the United States are limited in their capacity to borrow by the

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provisions of their state constitutions. Limitations on the borrowing capacity of state governments are less direct, and arise out of the necessity of conforming to a rigid procedure that requires considerable time and usually the consent of the voters of the state. Both the form and content of the restrictions on local governments, city, county, town and other public administrative agencies, differ markedly in the various states and do not lend themselves to any simple summary description. Such constitutional limitations as there are, restrict the purposes of the debt, its amount, the amount of tax levy that may be used for debt payment, and often define the form of borrowing.

Almost universally the constitutional debt limit is stated as a percentage of the assessed value of property, the amount varying with the size of the governmental unit and the purposes of the debt. Thus, in many states, as is shown in Appendix J, the percentage of assessed valuation employed in computing the debt limit for the issue of water bonds is frequently either higher than for other purposes, or there is no limitation at all. Provisions regarding purposes of the debt differ widely and are equally hard to summarize. Thus, the counties and townships of Colorado are allowed to borrow only for the construction of county buildings, roads and bridges; whereas the loans of cities and towns are fixed in purpose and amount by vote of the tax paying electors and, in any event, the aggregate of loans may not exceed 3 per cent of the assessed valuation. In California, all loans in excess of revenue in any year in any subdivision require a vote of two-thirds of the electors. With regard, also, to the form of the loan, some state constitutions define the requirements in detail, as to methods of redemption, period of maturity, and the issue price, while others omit all specifications.

To reduce these constitutional and legislative limitations on borrowing to statistical terms is a task of large proportions that cannot be undertaken in a short period of time. A sample of what is involved in the problem of measuring the present unused borrowing capacity of American local governments was presented earlier in the discussion of the financing of public works by the governments of New York City and New York State.<sup>62</sup> It is not possible, on the basis of the information now available, to venture an estimate of the extent to which all types of limitation would at this moment restrict an expanding program of public construction

<sup>62</sup> See Chapters II and III, pp. 35-41, 71-80.



in the whole country. Barring unusual conditions, like that now prevailing in the City of Chicago, where unwise spending has impaired the credit of the municipal government, the probabilities are that credit limitations are not in general the crucial limiting factors.

For many types of public permanent improvements, particularly those that are revenue producing, local governments have devised new agencies which are allowed, under certain restrictions, to borrow on their own account. Such an agency is the Port of New York Authority, described earlier in this book;<sup>63</sup> and many of this character exist throughout the country. Wherever it is possible to make service charges, and hence to be assured of an income, local governments have either created new quasi-public administrative agencies or have permitted the organization of private companies, authorized to construct and operate the particular public utility. The State of Michigan, for example, permits "governmental agencies or municipalities" to grant "a franchise for a period not to exceed thirty years to any private corporation . . . to build, construct, own and operate a sewage or garbage disposal system . . ." and to charge a fee for its services. In Pennsylvania, an amendment to the state constitution in 1915 allowed municipalities "to exempt from calculations of borrowing capacity such water bonds as could be supported by the net earnings of the Water Bureau, in accordance with due certification of such fact by the Court."<sup>64</sup> "In Ohio and elsewhere there is authorization for issuing water revenue bonds, outside the normal limitation as to bonded indebtedness, provided net water revenues will sustain such issues."<sup>65</sup>

<sup>63</sup> See Chapter III, p. 79.

<sup>64</sup> Act 320, P. A. 1927 (511), Sec. 5.

<sup>65</sup> *Water Works Practice*, Manual of the American Water Works Association, Baltimore, 1925, p. 548.

## CHAPTER VIII

### FUTURE PROJECTS

Long-range planning of public permanent improvements is not yet in an advanced state in this country. While methods of financing, the making of budgets, and city and regional planning have received increasing attention from public authorities, many public works projects are still undertaken on short notice and in response to pressing needs. The legislative and administrative steps required before contracts are let, or the details of financing are arranged, are usually so many that it is difficult to estimate the probable volume of work to be undertaken until the year is well under way. For these reasons estimates of the total future projects of the various governments in the United States must contain a substantial element of uncertainty and error.

Exhaustive series of probable future undertakings, such as the one of "proposed work," published weekly by the Engineering News-Record, and that of "contemplated projects," published monthly by the F. W. Dodge Corporation, run in the past so far in excess of contracts actually let or expenditures incurred, that they can hardly be accepted as a reliable measure of the volume of future work. They are at the best an indication of the amount of construction under consideration. Many of the projects entering into these totals will no doubt be undertaken at some time in the future, and many will, with equal certainty, be either wholly abandoned or replaced by others.

Over short periods of time, likewise, it is not feasible to use the current figures of the volume of public bond issues in forecasting the probable amount of public construction. There are, first, a variety of uncertain factors to be weighed in predicting the course of the bond market itself. Some of these, as is well known, are of a temporary and even accidental nature, and may easily, for the time being, act to interrupt the long-time trend, and thus confuse the processes of forecast. The existence, further, of easy money rates and favorable bond prices are not the sole determinants of

increases in public borrowings. Mounting tax rates and debt service charges, or the failure of administrative agencies to plan their programs of permanent improvements sufficiently in advance has often kept down the volume of bond issues in the face of satisfactory conditions in the money market. In May, 1930, it is only possible to say that public agencies which are prepared to borrow for the financing of permanent improvements, will not, during 1930, be restricted by the fear of high money rates which were a potent and restraining influence in the eighteen months before.

Although precise forecast of the course of events in the near future is surrounded by these obstacles, it is reasonably clear from the available data that the secular trend of future public expenditures for permanent improvements is definitely and appreciably upward. The expected continuing increase of expenditures on public works in this country may be attributed to well-known causes. In the past decade the traffic congestion arising out of the wide use of the automobile has imposed upon all American governments an expanding budget of expenditures for road and street improvement. At the present time the cost of road and street building, and their maintenance, amounts to more than one-third of total outlays for public construction in the United States. From present indications, a considerable time will elapse before there can be expected any slackening in the rate of increase of expenditures for these purposes. Projects of road building; of the widening and extension of streets; of bridge and tunnel construction; of the building of boulevards and new arteries for traffic are now far behind essential and recognized requirements. Meanwhile, the cost of maintenance and repairs of existing highways, bridges, subways and tunnels has been steadily rising, and has come to represent a large item in the public budget of capital expenditures. Among the capital projects of the next decade, also, it would appear necessary to allow for the rising costs of facilities auxiliary to the aviation industry, which, with its development, may well impose new and unpredictable burdens of expenditure on local, state and federal governments.

The rising cost of maintenance and repairs is not a feature of road, street and bridge building alone. With the increase in the size and complexity of the modern public plant and equipment, there have come vast increases in the expenditures on maintenance which will, of course, in the future constitute a substantial and

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growing portion of the total public budget. Separation of the costs of maintenance and repairs from those of new construction is for most public agencies not possible, and where they are separated it is not certain that the classifications are reliable, but it is clear from the data that are at hand that the problem of financing the future maintenance of an expanding public plant is coming to be recognized as a difficult one. In the figures of expenditures on construction by the federal government, for instance, the cost of maintenance and repairs represented in 1929 nearly one-fourth of the total outlays on public works,<sup>66</sup> and it is probably no exaggeration to estimate the total expenditures on maintenance and repairs as no less than 15 per cent of the total cost of public construction in the country.

Much of the increase in public works is to be associated in the United States with the growth of large cities, where the items of transportation, water supply and sewage facilities alone account for the major part of the rise in total expenditure. In nearly every instance in this country, the rise of the large city has been followed by the growth of population in surrounding areas, with the result that these areas have undergone legal or de facto absorption. As a consequence of this movement, the standards of the public plant and equipment tend to rise over a widening territory, and to penetrate constantly because of the habits and standards of an urban population, into the rural areas. It was pointed out earlier<sup>67</sup> that the public works program of a community reflects the prevailing standard of living of its members. The factor of increasing school attendance,<sup>68</sup> the demand for improved water supplies and sewage facilities, in short, for advance in the material benefits of civilization, would appear to be a permanent feature of the American scene. The pressure for permanent improvements is bound to continue, and their adoption to be limited by the capacity of governments to pay for them.

Working in the same direction is the tendency, throughout American local governments, to create city and regional planning commissions whose function it is, among other things, to plan the future construction programs of public agencies. For the most part, these commissions occupy only an advisory position, but their

<sup>66</sup> See Chapter IV, Table 26, p. 88.

<sup>67</sup> Chapter I, p. 10.

<sup>68</sup> See *Recent Economic Changes*, Volume I, Chapter 1, p. 16.

incorporation into the administrative branches of government would appear to be only a matter of time. While the centralized planning and execution of programs of public construction should lead to great economies in administration all along the line, the total effect of planned and far-reaching programs of public works should be an increase in their gross volume.

A fundamental factor limiting the amount of expenditures on future projects is, of course, the capacity of the government to pay. In many small American cities, towns, and even states, whose expenditures for capital improvements have since the war been large, future outlays on the same or higher levels depend on a growing population, expanding industry and trade, and a steady increase in the assessed valuation of property. This condition is, however, not universal, and where such growth is not found, the program of public works is more likely to be curtailed than expanded. The City of Schenectady, New York, for instance, considers that the rate of growth of its population is decreasing. It does not, at the moment, look forward to any material industrial expansion within its limits. During the 10 years ending in 1928, the average annual increase in city expenses has been at the rate of \$377,000. By elaborate estimates of the probable future population of the city, and of the trend in the assessed valuation of property, the budget commission has concluded that ". . . the city's expense is increasing at a faster rate than its income based upon the yearly increase in assessable valuations."<sup>69</sup> In order, therefore, to prevent a rise in the tax rate prevailing in Schenectady in 1928, the commission proposes a capital budget for essential improvements in which expenditures would drop from \$1,546,000 in 1929 to \$100,000 in 1938, and would amount in the whole period to \$5,171,000, as contrasted with an earlier proposed budget of capital expenditures of over \$9,000,000.<sup>70</sup>

The limitations placed on increasing expenditures by bond limits and by too slow a rate of increase in the assessed valuation of property is again shown in the experience of San Diego City, California. Here it has been found that "the costs of government have increased much faster than assessed values" and that bonded indebtedness has been increased faster than the growth of bonding

<sup>69</sup> Capital Budget Commission, *A Long Term Financial and Improvement Program for the City of Schenectady, N. Y.*, Schenectady, N. Y., April, 1929, Section I, p. 7.

<sup>70</sup> *Idem*, Section II, pp. 47 and 52-53.

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capacity. . . ."<sup>71</sup> The facts are shown in Table 50. In this case, as in many others like it in this country, the consolidation of city and county assessing has resulted in reducing the assessed value of San Diego City. It is, in this connection, estimated that if the city property were on a higher assessment basis than county property,

TABLE 50. — ASSESSED VALUATIONS, BONDING CAPACITY AND BONDING MARGINS, SAN DIEGO CITY, CALIFORNIA 1917-1926

(In thousands)

YEAR	NET ASSESSED VALUATION	BONDING CAPACITY 15% OF VALUATION	BONDS OUTSTANDING AND AUTHORIZED	BONDING MARGIN
1917 . . . . .	\$84,660	\$12,699	\$10,614	\$2,085
1918 . . . . .	86,342	12,951	10,299	2,652
1919 . . . . .	86,616	12,992	11,518	1,474
1920 . . . . .	88,068	13,210	11,207	2,003
1921 . . . . .	93,365	14,005	11,356	2,649
1922 . . . . .	93,454	14,018	10,990	3,028
1923 . . . . .	108,247	16,237	11,946	4,291
1924 . . . . .	114,752	17,213	16,629	583
1925 . . . . .	121,537	18,231	16,710	1,521
1926 . . . . .	126,259	18,939	18,148	791

SOURCE: California Taxpayers' Association, Inc., Los Angeles, Cal., Report of San Diego City, California, Association Report No. 6, May, 1928, p. 21.

it would be possible to continue to increase bond issues and to retain satisfactory bond margins during the years 1927 to 1936.<sup>72</sup>

The City of Indianapolis, likewise, falls within that category of local governments that are faced with the necessity of reducing expenditures on future permanent improvements because they are rapidly exhausting their borrowing power. With projects during the next decade amounting to more than \$30,000,000, several departments of government would, as Table 51 shows, in that period exceed their borrowing capacity. The cost of the proposed improvements of the county government, for example, would exceed its bonding power by approximately \$5,000,000. This condition elicited the comment that Indianapolis must finance some of its

<sup>71</sup> California Taxpayers' Association, Inc., Los Angeles, Cal., Report of San Diego City, California, Association Report No. 6, May, 1928, p. 7.

<sup>72</sup> Idem, p. 30.

improvements "otherwise than by the issuance of bonds. . . . There is grave question whether any unit (of government) should so nearly use up its borrowing power. It would seem to be good practice to retain a margin of at least \$1,500,000, particularly for use in a real emergency." <sup>73</sup>

Where, on the other hand, population has been growing, trade and industry expanding, and, therefore, the assessed valuation of

TABLE 51. — BORROWING CAPACITY AND ESTIMATED COST OF IMPROVEMENTS, INDIANAPOLIS, 1930-1940

DEPARTMENT OF GOVERNMENT	TOTAL TEN-YEAR BONDING POWER	ESTIMATED COST OF PROPOSED IMPROVEMENTS, 1930-1940
Civil City.....	\$7,907,249	\$11,658,000
Parks.....	3,121,502	*
Sanitation.....	3,257,019	4,900,000
Schools.....	5,629,799	5,240,000
County.....	13,908,414	8,691,000

Sources: Indianapolis Chamber of Commerce, *The Need of Budgeting Capital Expenditures for Indianapolis*, July, 1929.  
 \* Not estimated.

property increasing, local and state governments have not felt the pinch of narrowing bond margins and reduced current revenues, and are prepared to proceed with large future projects of public works. The case of New York City and of New York State has already been described in detail.<sup>74</sup> During the calendar year 1930, the program of public construction for the territorial area of New York State, announced in January 1930 by Governor Roosevelt, contemplates total expenditures of roughly \$450,000,000, an amount nearly one-third greater than the average outlays for the same purpose during the preceding years.

The City of Buffalo, New York, had on June 30, 1928, a debt margin of nearly 50 per cent. The net debt of Buffalo is limited by the State Constitution to \$10,000,000 plus 10 per cent of its assessed valuation. As of June 30, 1928, the financial status of the

<sup>73</sup> Indianapolis Chamber of Commerce, *The Need for Budgeting Capital Expenditures for Indianapolis*, July, 1929, p. 19.

<sup>74</sup> Chapters II and III.

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city in this regard was as follows: <sup>75</sup>

Ten per cent of assessed valuation.....	\$105,991,310.50
Additional flat amount.....	10,000,000.00
	\$115,991,310.50
Constitutional limit of net debt.....	\$115,991,310.50
Bonds outstanding .....	\$88,573,695.57
Deductions:	
Water bonds .....	\$16,814,489.42
Less issues prior to 1904.....	1,352,169.10
	\$15,462,320.32
Certificates .....	6,128,861.57
Monthly local .....	148,811.60
Sinking Funds .....	2,816,162.48
	\$24,556,155.97
Total Deductions .....	\$24,556,155.97
Net Debt .....	64,017,539.60
Debt Margin (48.26 per cent).....	\$ 51,973,770.90

In the twelve years from June 1, 1918, to June 30, 1930, the capital expenditures of the City of Detroit have averaged roughly \$40,000,000 a year, and reached the peak, in 1926-1927, of more than \$66,000,000. Over the whole period the largest items in the capital budget have been sewers, schools, water, rapid transit and parks and boulevards. A ten-year improvement program, announced early in 1929, contemplates expenditures on permanent improvements, in the period 1929-1938, amounting to \$630,000,000 or \$63,000,000 a year, an average annual outlay far in excess of the average expenditures in the preceding decade. In this budget the largest items are as follows:

Rapid transit .....	\$200,000,000
Sewage disposal .....	90,000,000
Street openings and widenings.....	75,000,000
Schools .....	50,000,000
Water supply .....	50,000,000
Port development .....	25,000,000
Grade separation .....	20,000,000

It is not expected that the consummation of these projects will be hindered by financial difficulties. Extensions of water and street railway utilities will be financed out of water rates and car fares. "Assuming a normal increase in the City's assessed valuation during the next ten years . . . this program can be carried out with

<sup>75</sup> Buffalo Municipal Research Bureau, Inc., The Municipal Research Bulletin, *A Capital Expenditure Program*, Volume I, No. 16, November, 1928, p. 5.



very little effect upon taxes, and possibly without increasing the present rate at all for these purposes." Borrowing limits are 4 per cent of the assessed valuation for general public improvements; 2 per cent for water, 1 per cent for lighting; and 2 per cent for street railways. "Within these limits, there is ample margin and over for financing . . . requirements for water, lighting and street railways. The city is somewhat restricted . . . with a 4 per cent limit for such general public improvements as sewers, grade separation, port development, airports, playgrounds, hospitals and other public buildings. In fact, the limit at this time is so restrictive that improvements . . . now authorized" exceed the legal limit by \$12,000,000. Added borrowing power, however, "which will accrue as a result of the normal annual increase in valuations and other sources (such as annual sinking fund reserves), will be large enough to permit the gradual carrying out of the projects subject to this limitation."<sup>76</sup>

The annual expenditures of Philadelphia on permanent improvements exceed \$50,000,000. There is little evidence in the available material of any planned program of future projects. The ten-year program issued by the Mayor<sup>77</sup> does not indicate the cost of the various undertakings, but it is clear from their character that they will require expenditures larger than the budgets of the past years. The City of Philadelphia has borrowed heavily for public works, and its debt service charges have risen from 47.55 cents per \$100 in 1910 to 82.02 cents in 1926. The tax rate of the city is, however, low, and, if there were the disposition to do so, a substantial portion of the permanent improvements could be financed out of current revenue.<sup>78</sup>

In many instances, the prevailing political situation may materially affect the public works program. The electorate has, on occasion, refused to vote for bond issues when it had lost confidence in the officials of the government. On several occasions the voters of Toledo have rejected bond issues proposed by the administration. The situation in Chicago, in 1929 and 1930, is another illustration

<sup>76</sup> Detroit Bureau of Governmental Research, *Public Business*, Volume IV, No. 13, Feb. 15, 1929, *A Ten Year Improvement Program for Detroit, 1929-1938*, pp. 187 and 188.

<sup>77</sup> Mayor Harry A. Mackey's 10-Year Program for Central Philadelphia and West Philadelphia Development, no date.

<sup>78</sup> Bureau of Municipal Research of Philadelphia, *Citizens' Business*, No. 750, Oct. 5, 1926 and No. 901, Aug. 27, 1929.

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of the same condition. Dissatisfaction with the inequalities in fixing the assessed value of property; <sup>79</sup> fear of further extravagance and maladministration in the spending of public moneys has led the voters of Chicago to reject one bond issue after another. The banks, too, have stopped granting temporary advances to the administration, which was considered in a virtual state of bankruptcy, unable to meet its current obligations. Although there can be no question of the actual solvency of the City of Chicago, the state of affairs, in 1929 and 1930, has resulted in the suspension of many projects that would otherwise have been undertaken.

To form a sound judgment regarding the capacity of American governments to pay for expanding programs of public works in the future is, in the present state of our knowledge, a task of unusual difficulty. Conditions differ widely from place to place. From 1919 to 1927 the per capita net debt of American state governments nearly tripled, having increased from \$4.44 to \$12.32. Between 1921 and 1927 the per capita net debt of cities with a population of 30,000 and over increased from \$85.68 to \$128.27, or nearly 50 per cent. Again, between 1919 and 1927 the assessed valuation of real and personal property in the 48 states increased by nearly 80 per cent, from about \$80,000,000,000 to \$140,000,000,000.<sup>80</sup> The practice of assessing the value of all forms of property, however, is far from being uniform throughout the country, and there is no method by which it can be made so. In the future, as in the past, the capacity of government to pay will vary with the prosperity of the industry of the country, and may be expected to have somewhat the same rate of decline or advance.

<sup>79</sup> Herbert D. Simpson, *The Tax Situation in Illinois*, The Institute for Research in Land Economics and Public Utilities, Northwestern University, Chicago, Ill.

<sup>80</sup> U. S. Bureau of the Census, *Financial Statistics of Cities and Financial Statistics of States*.

## CHAPTER IX

### PLANNING AND PROCEDURE

Control, for whatever purpose, involves foresight and planning. If the purpose of a program for the control of public works is occasional acceleration, or a temporary increase in the volume of construction, this control can be best achieved by having available adequate financial reserves, the appropriate engineering plans and specifications, and the administrative facilities essential to an expanded and accelerated program of construction. It is clear that such requirements are not peculiar to a program of control designed to regularize employment and business. On the contrary, the creation and maintenance of proper financial reserves, the forward planning of permanent improvements, and the existence of the necessary administrative machinery are the requisite elements of any sound system of public administration. To the extent, then, that local, state and federal governments of this country show increasing preoccupation with the problems of planning and financing public works, with the end in view of achieving sound and economical administration, the way is paved for the control of public construction in the interest of stabilizing employment as well.

The effective use of these instruments of control, however, depends on the state of mind of thousands of administrative officers throughout the country, and on the traditional procedure employed in undertaking permanent improvements. In the near future such control as is contemplated must be accomplished within the existing framework of public administration. The army of public officials, whose daily activities naturally affect the planning of public construction, is on the whole less concerned with what it regards as distant eventualities, like widespread unemployment, than with the routine task in hand. The structure and function of American local, state and federal governments are the result of a long and slow process of development, which has been the product more of chance and tradition than of planning. Under the

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most favorable circumstances, then, a public works program is bound to encounter obstacles and limiting factors inherent in the prevailing systems of public administration.

Public officials, while they show concern over the problems of general business and employment stabilization, are naturally more involved with the details of procedure and administration encountered in specific projects. A national canvass of the opinions of some 5,000 public and quasi-public officials, undertaken in the last six months of 1929 by the Division of Building and Housing of the United States Department of Commerce, shows only an occasional attempt to control the volume of public construction in the interests of either cyclical or seasonal regularization of employment. More than 2,000 officers—city, county and state engineers and school superintendents, city comptrollers, city and regional planning commissions, secretaries of builders' exchanges and of local building trades councils, local chapters of the Associated General Contractors and university and college presidents—replied to the questionnaires of the Department of Commerce. In the vast majority of cases, the public official displays only slight interest in control, and has obviously had little experience in its use. The retardation and acceleration of public construction, when they are practiced, are due to considerations other than the desire for stable employment. Replies like the following are typical of those received from all parts of the country:

“. . . Most of our improvements are started by public demand, which looks with impatience on any delay in the prosecution of the work, once the initiatory steps have been taken and the funds provided. For this reason any cyclical control of this construction is impracticable.”

“New construction depends on bond issues which are usually voted during boom periods. Work is done after bond issue. Repair and maintenance work must be done during summer vacations. If it can be done in slack season, that time is chosen.”

“We build and repair as needed. We think any other reason unbusinesslike. We do not believe it would be more than a drop in the bucket in solving unemployment conditions.”

“We repair and construct buildings only when such work is necessary, and without consideration of business depression.”

“There is a natural reaction favorable to acceleration during prosperous times.”

"There is a tendency on the part of the public to refuse approval of building projects in time of depression and to approve them in time of prosperity. On all building projects requiring bond issues, it has been necessary to have a favorable vote of the electors. As a consequence of this, the best time for construction of public buildings, that is, during depression when men need work, is the time when an issue of the sort would be defeated."

"I find a tendency to postpone new construction and repairs because of hard times. I think this is a mistaken policy for work that must be done. The reluctance is due to an unwillingness to raise the tax rate."

"Frankly, depression or boom has not entered into our building plans."

In a substantial number of cases, various public works officials indicate an interest in the problem of regularization and profess to exercise a measure of control over their own construction programs. It is clear, however, from the context of their statements and from the evidences of control which they adduce, that actual practice falls considerably short of a planned program of public construction. Seasonal control appears, in nearly all instances, to consist in delaying projects until weather conditions are favorable and, thus, concentrating construction in sharp seasonal peaks. Only in rare instances, where local governments have passed through a period of reorganization due either to a political upheaval or the education of the electorate to more efficient methods of public administration, have effective steps been taken in the direction of planned programs of public works.

Of much greater significance than the attitudes of public officials, are the obstacles in the way of a rational, far-sighted program arising out of the nature of many American local governments. As economic and social units, most American cities have outgrown their political boundaries. Actual extension of the geographical area of the city, through the pressure of population, has resulted in imposing on the area a variety of political jurisdictions, with diverse powers of government, whose unification for purposes of administration may be regarded as a slow and painful process. Probably the most striking illustration of this condition is the City of Chicago.<sup>81</sup>

<sup>81</sup> Report of the J. L. Jacobs Company for the Advisory Board of Estimate and Apportionment, Chicago, January, 1929.

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"One of the fundamental reasons for the confused administrative and recurring serious fiscal problems of the local government in Chicago and in Cook County, is the extreme decentralization of local government. No community in this country presents a greater complexity and multiplicity of political units.

"Within the City of Chicago there are some thirty-one distinct and independent local governments. In addition there are at least six semi-independent tax levying agencies, the tax levies of which are spread by some of these local governing bodies.

"In Cook County outside of the City of Chicago, there are approximately 380 additional local independent and semi-governmental agencies.

"In addition to the city government embracing the entire area of the City of Chicago, there are a number of independent and semi-independent tax levies and governing bodies embracing the Chicago area in whole or in part. These independent and semi-independent local governments with tax levying powers include the county government, the sanitary districts of Chicago, the Chicago Board of Education, the Chicago Library Board, the Municipal Tuberculosis Sanitarium, the Fourth Reserve District, twenty independent park districts, two Mosquito Abatement districts, and two operating and six non-operating townships. While the independent park districts do not overlap each other, between them all they embrace almost the entire area of the City.

". . . The administration of the functions of local government in Chicago and Cook County is thus divided among the 415 or more of the independent or semi-independent governments, each having a tax levy and borrowing powers. With the increases in the number and growth of some of these independent local governments, there have necessarily ensued considerable duplication and overlapping in certain activities and lack of coordination in others.

"The planning, design, and construction and maintenance of extensive public works and of surface and underground improvements are similarly diffused. Annual expenditures now totaling over a million dollars for these purposes are made with little or no coordinated planning. Separate engineering, designing and construction and repair forces are maintained by the independent agencies.

"An example of the duplication that exists is the comparatively recent venture of the Sanitary District into the Public Health work in the same territory served by the Health Department of the

City of Chicago and the health services of other municipalities within the country.

"Multiplicity of local governing bodies has also brought with it lack of coördination in the issues of bonds and spreading of special assessments in the same or adjacent governing units.

"The undertaking of public improvements with little reference to the extent or time of payment and retirement of bonds and the sources of revenue available and expected ultimately to finance such retirement, has not only brought on financial crises among some of the local governments, but many necessary improvements have been set back because of unwillingness on the part of the taxpayers to burden themselves further without some assurance that the expenditure of public monies for such improvements will be along sound and economical lines."

Divided responsibility on the scale in which it has existed in Chicago is, naturally, an open invitation to waste and inefficiency, and where such a condition persists it is futile to count on a planned public economy and on the availability of financial resources when they are most needed. In a less extreme form, situations not unlike that of Chicago are to be found in many of the local governments of the country, particularly where there is overlapping of function and conflict of jurisdiction. The simple case of county control over assessed valuation of property and its effect on the revenue of the city has already been cited.<sup>82</sup> In the City of Cincinnati, Ohio, the relation between city and county governments acted to retard public improvements until the condition was remedied by the adoption of a new city charter in 1924. Before the present charter, the city was under the financial domination of the county, with the result that the electorate of Cincinnati refused to approve bond issues and essential permanent improvements were not undertaken.

Under the new charter, the city enjoys financial home rule. It is allowed to tax itself, without the approval of the county or the voters, up to \$6.65 a thousand for current expenses. City officials may also, on their own initiative, submit to a vote, bond issues that would raise the tax rate to any amount desired. This independence of the municipal government has curbed the expenditures of the county since, with the rise in the city tax rate, the maintenance of the former tax rates of the county and school board

<sup>82</sup> Chapter VIII, p. 154.

would produce a combined rate far above the level the voters would accept. The city, county and school board have consequently come to an agreement which is tantamount to a financial program. By this arrangement a joint financial committee of the school board, the county and the city plans an annual and five-year program based on the budgetary estimate of the various bureau heads. It is the purpose of the committee to make capital outlays at a steady rate and, if possible, to prevent more than one major enterprise from being undertaken at the same time. For the combined tax rate of these three units of government the committee has fixed an arbitrary maximum of \$2.25 per hundred. The whole plan thus constitutes an ordered program of public expenditure for both current purposes and permanent improvements that are not suspended, as was the situation before 1925, by the lack of the necessary funds.

The initiation and completion of permanent improvements is, in all American governments, subject to the limitations of the prevailing legislative and administrative procedure. Between the proposal of the new project and the actual beginning of construction considerable time is usually required because of the checks and balances characteristic of American government and because any substantial construction project involves many indispensable steps of preparation and planning. The procedure practiced in New York City and New York State, while it differs in detail from the practices in other municipal and state governments, is substantially typical of the procedure throughout the country and is indicative of the length of time that elapses between consideration of a project and the beginning of work on it.

The making and adoption of budgets of public expenditure consumes everywhere considerable time. The Bureau of Municipal Research of Philadelphia has, in this connection, described the procedure and estimated the time required to authorize loans of the City of Philadelphia.<sup>88</sup> Procedure consists in consideration of a particular bill by the Councilmanic Committee; advertising the bill before its final passage; final passage of the bill by the Council; and enactment of the bill into an ordinance. Each of these steps in the procedure of loan issue requires time. Two weeks may be regarded as a reasonable period for loan bills to remain in com-

<sup>88</sup> Bureau of Municipal Research of Philadelphia, *Procedure and Time Required to Authorize Loans of the City of Philadelphia*, November, 1929.



mittee, although their consideration may take as long as four weeks. "The earliest time for completing the required advertising may be taken to be the fourteenth day after the one on which the bill is reported to the council." Bills that require advertising may reasonably have their final passage one week after the completion of the advertising. Finally, the enactment of the bill into an ordinance, which may be accomplished in three distinct ways, may require as much as from 21 to 28 days. The whole matter of procedure in this regard is by no means simple; and an examination of this report of the Philadelphia Bureau of Municipal Research will reveal how much time can be saved where there is an effective desire to hasten the proceedings. Thus the difference between the minimum and maximum time required to report a bill out of committee is 28 days; and the margin between maximum and minimum time for required advertising is 21 days.<sup>84</sup>

Procedure not only varies from locality to locality but also with the type of permanent improvement and with the method of financing. The procedure and time involved in undertaking public works financed by special assessment are quite different from the conditions prevailing with construction financed out of bond issues or general revenue receipts. In the local governments of Ohio, for instance, public construction financed by assessment requires the following procedure: public works, such as the construction of pavements, water mains, sewers and occasionally roads, parkways and schools are initiated by popular petition. Plans and specifications are then prepared and presented to the proper legislative body. Concurrently it is necessary to fix the boundaries of the assessment district. The preparation of assessment lists is the next step. In cities with good lot and block maps, a list of property owners can be prepared easily and the notice of proposed assessments made promptly. Otherwise, more time is required. Following the serving of notice of assessment, the property-holders are usually allowed a month to file their protests. Property owners may then appeal from the decisions of administrative officers to the courts, and when that happens delays of two or more years are not uncommon.

Such diversity in practice it is impossible to reduce to statistical summary. The procedure involved in carrying out constitutional

<sup>84</sup> *Ibid.*, pp. 18, 21. For a description of procedure in the City of Cincinnati, see *Manual of Legislative Procedure and Rules of Council, Cincinnati, Ohio, 1929.*

limitations on loans, described earlier in this report;<sup>85</sup> the preparation of plans and specifications; the steps involved in acquiring the property required for the project in hand; the additional procedures related to the various methods of raising funds for public works; the processes of competitive bidding and choice of contractors; and the legislative routine fixed by law or custom are the unavoidable stages that precede the employment of labor on projects of public construction. The time consumed in traversing these steps depends on the efficiency of government; on its capacity to plan for the future and on the willingness and ability of its legislative and executive officers to adhere to a program.

Much has already been accomplished toward the development of a planned public economy in this country. In many municipal and state governments the pressure of rising tax rates and public debt, and the desire for economy in the administration of public funds has led to more systematic preparation of budgets and to attempts to plan permanent improvements some years ahead. Experiments of this type in Buffalo, Schenectady, Detroit and Cincinnati<sup>86</sup> have already been mentioned. In the case, also, of vast public works like subways, water supply and sewage disposal facilities, the nature of the enterprise has forced long-range planning and has produced programs of construction extending ten years or more into the future. The future subway and water supply programs of New York City are illustrations of elaborated plans that arise out of urgent and predictable requirements in the future.

The trend toward the widening control of public works is further indicated in the increase in the number of such research and planning organizations, as bureaus of municipal research and city and regional planning commissions, more or less closely associated with many local governments. Although the majority of these agencies have not been vested with executive powers and many are hampered by lack of funds, their elaborate analyses and pro-

<sup>85</sup> Chapter VII, p. 147-149.

<sup>86</sup> See Cincinnati Bureau of Governmental Research, Report No. 15, *The Joint Bond Program, County, School District, City of Cincinnati, Annual Financial Analysis*, May, 1929.

grams have already had a substantial effect on public opinion and, consequently, on the plans of various agencies of public administration. It is not unlikely that the future will witness a much closer cooperation between public administrative agencies and city and regional planning commissions than now prevails.<sup>87</sup>

<sup>87</sup> For a description of city and regional planning commissions, see United States Department of Commerce, *A Standard City Planning Enabling Act*, Government Printing Office, Washington, 1928; and *A City Planning Primer*, *ibid.*, 1928.

## CHAPTER X

### THE PROBLEM OF CONTROL

The use of public works as a measure for reducing the volume of unemployment is not a modern invention. In England, on the continent of Europe, and in the United States, variants of this device have been employed for centuries by local and central governments. With the passage of time, both the theory and practice of such attempts to reduce the volume of unemployment have become more complex. In the contemporary economic world, a public works program is no longer regarded as a simple method for creating some additional employment, but is conceived to be also the means of stabilizing business, under some circumstances, and of stimulating it, under others. Any of these approaches to the problem soon encounters profound and troublesome theoretical difficulties that cannot be easily resolved. A satisfactory theory of public works control must be at the same time an adequate explanation of business cycles, capable of accounting for variations in the levels of business activity over long and short periods of time. How far economic science is from the clean-cut solution of this one of its most fundamental problems is too well known to require further consideration here. The purposes of this discussion can, therefore, be best served by stating the problem, in its various forms, and by estimating the results, so far as that is possible, of attempts to reduce unemployment or to stabilize business by controlling the volume of expenditures on public construction.

Historically, increased appropriations for public works were generally invoked, during periods of depression and unemployment, as the obvious and direct means of creating work for the unemployed. While there has been long and continuous experience with this device, there is no evidence that a substantial proportion of the unemployed were ever absorbed in the process. However considerable public expenditures for this purpose were, they were always too small to produce an appreciable effect on the prevailing levels of unemployment. These measures, also, in the form in

which they have been universally practiced, have given rise to new and unanticipated evils that have done much to discredit this particular solution of the unemployment problem. The additional public works were usually created *ad hoc*; and were conceived and executed without previous planning. Their administration involved great waste and led often to the demoralization of the labor employed on these public enterprises. Coupled as they frequently were with poor relief, they absorbed the defects and evils of poor law administration. The researches of Sidney and Beatrice Webb into the history of this device in England disclose conclusions of such universal importance that they deserve to be quoted in full. Writing of the investigation of the operations of the Poor Law from 1886 to 1905, the Webbs state<sup>88</sup> that the reports of the special investigators for the Poor Law Commission of 1905-1909 "reveal the local authorities, at first reluctant to spend the ratepayers' money, gradually yielding to the pressure exerted by public opinion, by the House of Commons and by the Local Government Board, and striving to devise any form of useful work on which to employ the local unemployed. The old expedients are again employed. The local authorities again revert to hand labor on the roads, instead of sweeping and repairing by horsepower or steam-driven machines. They lay out more new parks and recreation grounds, and effect costly sewerage schemes and street improvements. But one after another they find it as impossible as before to adhere to the idea that 'the wages paid should be less than the wages ordinarily paid for similar work.' Any such attempt to discriminate in wages between the ordinary municipal staff and the extra men taken on as 'the unemployed' not only produced disgust and angry rebellion, but also, when piece work was made the basis, led to respectable and well-conducted men earning less than they needed for bare subsistence. . . ." There was "renewed swamping of the lists (of unemployed) not by men from permanent situations, but by men who had been at no time more than intermittently employed. . . . This meant, as before, only a series of short jobs for each man, with the result not only of positively increasing all the evils of casual labor, but also of creating a permanent dependence on an endless succession of these artificially manufactured municipal jobs, which it was impossible to main-

<sup>88</sup> Sidney and Beatrice Webb, *English Poor Law History: Part II: The Last Hundred Years, 1929*, Volume II, pp. 653 ff.

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tain indefinitely. Moreover, as it was found impracticable to pay lower rates than were normally earned by the lowest grades of unskilled laborers, who swarmed into the relief works, there seemed nothing to be done but to restrict the jobs to a few days in the week, or to one week at a time, for each man taken on, during the whole course of the winter. And every local authority in succession once more discovered, as their predecessors of the 18th and 19th centuries had done, that every such attempt to 'set the poor on work,' even at the lowest possible wage, and even where safeguarded by systems of piece-work remuneration, was prodigiously costly. Every piece of work took longer to perform than had been expected, and involved considerably more expense than it was on any computation worth. Nor did it all go to the unemployed. To supply the materials, provide the horses and carts and other necessary plant, and pay officers for the direction and supervision of the work, to be carried out by unskilled, inefficient and not very strenuous labor, proved ruinously expensive. . . . Finally it came to be recognized, even among the workmen, that it was impossible, in this artificial manufacture of municipal work, to avoid anticipating the ordinary employment of the permanently engaged staff of laborers, or that of the contractors, so that the very employment of the Unemployed was creating, for the future, even more Unemployment.

"We cannot imagine a more conclusive test of the value of provision for the Unemployed by way of municipal relief works of the most varied kinds, in many different towns, under all sorts of administrators and in the most diverse circumstances, than that afforded—in succession to the previous experience between 1836 and 1880 and to that of the widespread and repeated series of experiments of 1886-1905, by the operations between 1906 and 1909, under the Unemployed Workmen Act."

Even in Germany, since the end of the World War, elaborate plans for providing relief work to the unemployed failed to produce striking results. With funds contributed by the Poor Law authorities, or in the form of loans from the federal and state governments to the municipalities, or loans and subsidies from the unemployment insurance funds, the German experiments ran into difficulties not unlike those of the English. The improvised public works could absorb only a small proportion of the unemployed. Where it was attempted to prevent wasting money by discovering

"productive" or "value-creating" public relief works, it was found after a while that Germany was "beginning to experience difficulty in finding suitable value-creating relief works." Where, again, the unemployed were put to work on relief jobs at low rates of pay, the unemployed person "would remain on the job" or "do good work only when he received a bonus . . . with the result that his pay had to be raised above the relief rate."<sup>89</sup> As one acute and experienced observer puts it, "For nine years after the Armistice, German ideas of relieving the able-bodied unemployed were influenced by two abstract principles: firstly, that monetary relief should only be given on proof of need, and secondly, that it should be conditional on the performance of work. The practical abandonment of these two doctrines in Great Britain was looked upon as imprudent, but, in the event Germany has been compelled to come round to something very like the British attitude. The means test was always invidious and, under a federal system, led to wide variations in the methods of assessing needs and benefits. . . . The second principle broke down because it was never possible to provide relief works for more than a small minority of the applicants and that only at great cost. The numbers so employed in recent years have varied between 127,000 in July 1927 and 40,000 in December 1928. In April 1929 about 66,000 or 4.5 per cent of all persons in receipt of benefit, were on relief work. Owing to the seasonal nature of most of the work, the numbers always fall away in winter, when unemployment is at its worst."<sup>90</sup>

A further attempt by the public agencies of Germany to relieve unemployment by creating work was abandoned in 1927 when loans to private industries for this purpose were discontinued. Of this experiment, it has been said that . . . "there were numerous problems. . . . A factory might close down in order to apply for a loan to reemploy its workers, or, a firm might receive a loan for the purpose specified and thereby cause others to demand the same treatment. Choice between the numerous requests was difficult. Often it was impossible to know which cases were justified in applying for funds and which ones were misusing the privilege. The money was loaned by the government on low rates of interest,

<sup>89</sup> Mollie Ray Carroll, *Unemployment Insurance in Germany*, The Brookings Institution, Washington, D. C., 1929, Chapters IV and IX.

<sup>90</sup> R. C. Davison, *Unemployment Relief in Germany*, The Economic Journal, London, March 1930, p. 140.

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so that there was incentive to apply for it. Further danger lay in continuation of the grant after the firm had ceased to need it. Another evil lay in the possibility of loaning money to firms with inefficient methods or lacking a market for their goods. There was danger, too, of use of political power to secure special concessions. Experience with subsidies to private firms was for the most part unsatisfactory. . . ."<sup>91</sup>

It is clear from past experience with unpremeditated emergency programs of public works that they all suffer from inherent difficulties. A sudden increase in public construction, not safeguarded by careful advance planning, inevitably produces large and unavoidable wastes. Public enterprise, no more than private business, is equipped to handle swift expansions in its work-force. Faced with the necessity of finding work for a substantial labor force, governments have frequently initiated public works of doubtful value to the community. Where, moreover, the problem is one of finding work for a million or more unemployed, as is so frequently the case during a modern industrial depression, it is plainly impossible for modern governments to expand their facilities rapidly enough to supply jobs, directly or indirectly, for as few as one-half of the unemployed, much less for all of them. Public construction, first of all, requires only certain types of labor. The unemployed usually are recruited from all industries. The cost of training these diverse types of workers would not only be prohibitive, but their adoption of new occupations would quickly produce serious and permanent dislocations in the labor market. The recruiting of an adequate supervisory force would involve consequences no less serious. An expanded program of public construction of this sort would require large purchases of tools and new equipment, which would be scrapped or laid aside once changed conditions necessitated a reduction in the volume of public works.<sup>92</sup>

<sup>91</sup> Mollie Ray Carroll, *op. cit.*, p. 39.

<sup>92</sup> The United States Secretary of War commenting on the plan for a public works reserve wrote on April 7, 1928, as follows: "The public works under the charge of this office which would be affected by the proposed legislation are those for the improvement of rivers and harbors and for flood control. For carrying out the bulk of river and harbor work special equipment is necessary. The amount of this equipment available throughout the country, including that privately owned, is not a great deal more than is necessary for work under the present scale of appropriation. If the appropriation should be doubled for a short period, it would be



The recognition of some of these problems has led those who look to the expansion of public construction as the source of appreciable additional employment to propose the creation by governments of reserves of public works. By the terms of this proposal, a planned program of public works would consist of contraction in the volume of public construction during a period of full employment and expansion, from the reserves set aside in the past, during periods of dull business and slack employment. "What is in view is not only the putting in hand of work when unemployment has become great, useful as that is; the larger idea is the deliberate reservation of work, until such time as unemployment becomes great. It is a refusal to employ at one time in order to employ at another." <sup>88</sup>

Implicit in the notion of a public works reserve there is a program for the stabilization or regularization of business. The underlying assumption of all such plans must be that public construction should be reduced when industry is advancing at too rapid a rate, and accelerated when the tempo of industrial activity has slackened. In substance this type of control over public expenditures for construction is analogous to the attempts of central banks to control the volume of credit and through that the volume of business activity. Both methods contemplate the avoidance of inflationary practice; and both, in order to be effective, must come to an arbitrary decision regarding the proper rate of expansion of business activity, of industrial output, of bank credit, or of whatever criterion of inflation may be chosen. How difficult such a choice in the administration of a central banking system is, is well known; and there is no reason to believe that the choice and decision will be any easier for the public works authorities of a country. If, moreover, the amount of public construction withheld from current programs is substantial, say at the rate of one billion dollars a year, the withdrawal may well have the effect of precipitating or hastening a decline in business that might otherwise

necessary, before it could be spent, for the Government or contractors to acquire a large amount of additional equipment. When the appropriation reverted to its normal size, this additional equipment would be idle with heavy carrying charges . . ." Calendar 862, U. S. Senate, 70th Congress, 1st Session, Report No. 836, p. 2.

<sup>88</sup> D. H. Macgregor, *British Aspects of Unemployment, Some Aspects of Recent British Economics*, University of Chicago Press, 1923, Chapter II, p. 45.

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not have been inevitable.<sup>94</sup> It might also be urged, with reason, that the burden of avoiding inflation cannot be imposed upon the public authorities, without producing serious consequences in private business. "Private industry ought not to be induced to think that in the boom it can work all the overtime it likes, make all the money it can, and discard on to public authorities the effects of this in the bad times which follow. A strong sense of responsibility among employers generally is the most desirable thing to create; and advocacy of public schemes should be qualified by the caution that, both as regards amount and as regards the feasibility of delay in allocating contracts, we do not know how far they will carry us."<sup>95</sup>

Although the volume of public works usually, but not necessarily, expands with the expansion in general industrial activity, the conditions of rising levels of business often impose limits on the increase of public expenditures. Tightness in the labor market, arising out of the requirements of private industry for help, tends to restrain public officials from expanding their programs. Where business activity is again accompanied by rising prices for materials and equipment, public operations are occasionally delayed until more favorable prices prevail. Where, as is often the case, a rising tide of business and industry causes a rise in money rates and a drop in bond prices, governments, which must resort to borrowings for the financing of their various construction operations, may and do withhold their bond issues until money rates have eased and bond prices have risen and thus create what may be properly described as a natural reserve of public works.

In the United States, and probably in other countries as well, considerations of practical exigency would make most difficult the wholesale postponement of public construction. The testimony is overwhelming that nearly all local and state governments in this country are always far behind in their programs of permanent improvements. The bulk of American expenditures on public works is employed in the construction of schools, hospitals and prisons; in extending the means of transportation by the building of roads, bridges, tunnels, and subways; in ministering to the health of the

<sup>94</sup> Cf. J. M. Clark, Round Table Conference: *Public Works and Unemployment*, Proceedings of American Economic Association, March, 1930. See also F. G. Dickinson, *Public Construction and Cyclical Unemployment*, Annals of the American Academy of Political and Social Science, September, 1928.

<sup>95</sup> D. H. Macgregor, *op. cit.*, p. 49.

citizens of the country by providing adequate water supply and sewage systems; and in attempting to reduce the growing hazards of accidents by the elimination of grade crossings. The facilities for all these purposes are in general so far below the physical requirements of the prevailing situation, that it would be hard, if not impossible, to persuade public authorities to hold back one or more projects to meet a future eventuality of general unemployment.

A third variant of the theories of the control of public works overlooks the creation of reserves of work and plans the exercise of control by increasing the expenditures on public construction at the beginning of an industrial depression or during its course. Advocates of such a program do not look to the expanded volume of construction as a means of absorbing all or even a majority of the unemployed. They do not also conceive new public projects as measures for testing the willingness or capacity of the unemployed to work. They would restrict the new public enterprises to productive projects, or such as would be expected to contribute to the productivity of industry generally; and they would purge the administration of all wasteful and uneconomic practices. So conceived, the occasional acceleration of public construction would constitute a stimulus to business and would lead, if done on a large scale, to the progressive diffusion of employment. The best statement of this position is that made by the English economists, H. D. Henderson and J. M. Keynes: "The fact that many work-people who are now unemployed would be receiving wages instead of unemployment pay would mean an increase in effective purchasing power which would give a general stimulus to trade. Moreover, the greater trade activity would make for further trade activity; for the forces of prosperity, like those of depression, work with a cumulative effect. When trade is slack there is a tendency to postpone placing orders, a reluctance to lay in stocks, a general hesitation to go forward or take risks. When, on the other hand, the wheels of trade begin to move briskly, the opposite set of forces comes into play, a mood favorable to enterprise and capital extensions spreads through the business community, and the expansion of trade gains accordingly a gathering momentum." <sup>98</sup>

In reply to this point of view, it has been held that the state cannot increase the opportunities for additional employment with-

<sup>98</sup> Quoted in Henry Clay, *The Post-War Unemployment Problem*, London, 1929, p. 127.

out drawing on the available supplies of credit. Such a procedure would be tantamount to diverting credit from private to public use and the workers from private to public employment without increasing the total number of available jobs.<sup>97</sup> "Employment depends on demand, which depends on consumers' outlay, which in turn is limited by the means of payment available. If the expansion of government enterprise is accompanied by no expansion of credit, it cannot increase employment, because there is no addition to the means of payment and the government merely diverts consumers' outlay from the commodities and investments they would otherwise have bought to its own purposes."<sup>98</sup>

This argument rests partly on the assumption of the existence of a fixed pool of credit available for the uses of business and industry. In a period of depression, however, "the rapidity of circulation is low, because people cannot find profitable outlets for their surplus funds and they accumulate idle balances. If the Government comes forward with an attractive gilt-edged loan, it may raise money, not merely by taking the place of other possible capital issues, but by securing money that would otherwise have remained idle in balances."<sup>99</sup> Furthermore, "industry has expanded after trade depression in the past, without any prior increase in capital resources, because the expansion itself provides the resources out of which expansion is possible. The problem is to find the causes that stimulate expansion, and the placing of a large number of Government contracts might be one of them."<sup>100</sup>

In this tentative form, the theory of control must needs be left.<sup>101</sup> Frequent attempts have been made in this country to achieve control for one or another of these purposes, by legislative provisions. Of the many measures so proposed,<sup>102</sup> among the most recent and most typical are the Jones Bill introduced in the United States Senate on January 11, 1928, and a bill introduced in the

<sup>97</sup> R. G. Hawtrej, *Public Expenditures and the Demand for Labor*, Economics, London, March, 1925, p. 38.

<sup>98</sup> Henry Clay, op. cit., p. 131.

<sup>99</sup> Hawtrej in Clay, op. cit., p. 131.

<sup>100</sup> Clay, op. cit., p. 129.

<sup>101</sup> For a comprehensive review of the theoretical bases of this problem see, Georg Bielschowsky, *Business Fluctuations and Public Works*, Quarterly Journal of Economics, Feb., 1930, p. 286.

<sup>102</sup> See Otto T. Mallery, *The Long-Range Planning of Public Works*, in "Business Cycles and Unemployment," National Bureau of Economic Research, New York, 1923, p. 247.

legislature of Massachusetts in January 1930 by Mr. Eliot Wadsworth. The Jones Bill,<sup>102</sup> entitled "A bill to create a prosperity reserve and to stabilize industry and employment by the expansion of public works during periods of unemployment and industrial depression," provides for the authorization by Congress of appropriations amounting to \$150,000,000 for use in road building, river and harbor works, flood control, and public building, on condition, however, that "no appropriation shall be made pursuant to the authorization contained in this Act until such time as the President finds and communicates to the Congress that the volume, based upon value, of contracts awarded for construction work in the United States, has fallen 10 per cent for a three-month period below the average of the corresponding three-month periods of the preceding three years." The Massachusetts bill designed to "provide reserves of municipal credit for use in times of depression" authorizes a city or town to incur indebtedness, beyond the constitutional limitations, "not exceeding one half of one per cent of its valuation . . . provided, however, that such additional indebtedness shall be available only upon authorization of the Governor for all cities and towns of the Commonwealth, and for a period of six months from the date of such authorization, and bonds issued thereunder shall run for not more than ten years, and the municipal ordinance authorizing the loan shall certify that the date on which the work involved shall start is within the six months' period stated, or the bonds shall be void and unsalable." No measures of this kind have been enacted into the law of this country either by Congress or by the State Legislatures.

Whether a wise policy for the control of public works is that of retardation and the setting up of reserves for future use or that of acceleration for the purposes of stimulating business, it is clear that the control must rest upon sound economic foundations. In this country the future projects of public permanent improvements are so vast and well-defined as to make it unnecessary to resort to makeshifts in the search for additional work. Although bonded indebtedness and local tax rates have risen at a very rapid rate since 1920, probably faster than the assessed valuation of property, there is little evidence that temporary expansion of public construction, even on a large scale, would create financial embarrassment. In this, as in other proposals for economic control, the

<sup>102</sup> S. 2475, 70th Congress, 1st session, as amended April 18, 1928.

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problems are largely administrative. Aside from the uses of control over public expenditures in the interests of business revival or regularization, nearly all local and central governments in the United States would benefit vastly from a more planned economy than they now have. In the purchase of supplies and equipment, the typical municipality often has much to gain from the unification and centralization of its purchasing agencies. In the laying out of streets, the planning of public buildings and the like the benefits of prior and deliberate consideration of the projects are bound to be substantial. Making, likewise, adequate preparations for the financing of the multitudinous projects now undertaken by American governments and deciding on the method and time of the financing are elements in public finance where, past experience has shown, the margin between sound and unsound practice is wide and treacherous. For the effective solution of these problems of public economy, federal, state, and local governments require the appropriate agencies of planning and control. In many places such agencies, in the guise of budget commissions, city and regional planning commissions, bureaus of governmental research, or voluntary committees of citizens, have become more or less an organic part of the government and in this capacity serve the functions here outlined.

Many instances are already on record in which local governments have resorted to planned budgets of expenditures for permanent improvements. In Cincinnati, where such a program has been in operation for three years, expenditures are planned for a period of five years and the machinery has become available for exercising considerable control over the prevailing volume of public works. In the last report of the Cincinnati Bureau of Governmental Research, proposals are made which, when adopted, are likely to widen considerably the area of control over all types of construction. It is proposed, for example, that the financial analysis of the joint bond program of the county, school district and City of Cincinnati "include a broader and more significant picture of economic trends in the metropolitan area"; that "the programs of future governmental activities be based upon exhaustive surveys"; and that "the programming ultimately have a broader base" since the institutional programs of private organizations in the field of health, welfare and recreation are intimately related with those of the city, county and school district and since "the track exten-

sions and utility installations of utility corporations bear directly on road construction programs of city and county governments."<sup>104</sup> The use of the budget procedure and the resultant long-range planning of public works is being rapidly adopted through the country. While the pioneering activities in this direction were undertaken by more or less formal agencies, like bureaus of governmental research or planning commissions, considerable progress toward the same goal has come in recent years from the efforts of voluntary local committees interested at the same time in the economical administration of public affairs and in the stabilization of industry. The Community Conference Board of Rochester, New York; the committee recently appointed by the Governor of New York State; and the Philadelphia Committee which recently issued its program for *The Regularization of Employment and the Decrease of Unemployment in Philadelphia* are examples of only a few of the voluntary agencies that have in the past decade been organized for the consideration of these problems in this country.

Where, then, these procedures for control have become available, acceleration in the program of public construction may be regarded as a practicable measure. In the administration of such control, the crucial problem is obviously that of properly timing the increase in public expenditures. The profound significance of the time element is revealed in an analysis of the fluctuations in contracts awarded for public works and public utilities as compared with the movement of contracts awarded for other types of construction as well as with fluctuations in general business conditions in the country. This study, made by Wesley C. Mitchell and Simon Kuznets of the National Bureau of Economic Research, appears to show that, in the period from 1919 to 1924, contracts awarded for public works and public utilities were not highly sensitive to cyclical movements in business. Thus, in the cycle 1919-1921 contracts for public works and public utilities turned down at recession, and continued to decline all the way through the revival of the next cycle. But of the other groups, residential, commercial and industrial building, only industrial contracts showed the same type of behavior, although they ceased declining during the last

<sup>104</sup> Cincinnati Bureau of Governmental Research, Report No. 15, *The Joint Bond Program, County, School District, City of Cincinnati, Annual Financial Analysis*, May, 1929.

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period of business contraction. Again in the cycle, 1921-1924, public works and utilities began to decline early and continued to decline mildly through the first phase of the next revival. In this cycle, both commercial and residential building revived earlier. During the cycle 1924-1927, however, when there had been a large and persistent increase in the volume of public works, the revival of public works and utilities preceded the revival of general business.

TABLE 52. — CONSTRUCTION CONTRACTS AWARDED IN THE FIRST FOUR MONTHS OF 1929 AND 1930\*

GENERAL CLASS	FIRST FOUR MONTHS		PER CENT Increase (+) OR DECREASE (-)
	1929 (In thousands)	1930 (In thousands)	
Commercial buildings.....	\$322,215	\$277,198	- 14.0
Industrial buildings.....	243,268	184,219	- 24.3
Educational buildings.....	107,705	110,754	+ 2.8
Hospitals and institutions.....	29,565	65,237	+ 120.7
Public buildings.....	49,125	43,735	- 11.0
Religious and memorial buildings....	28,106	34,043	+ 21.1
Social and recreational projects.....	48,909	45,899	- 6.2
Total non-residential buildings....	\$828,893	\$761,085	- 8.2
Total residential buildings.....	721,247	366,029	- 49.3
Total buildings.....	\$1,550,140	\$1,127,114	- 27.3
Public works and utilities.....	347,750	452,910	+ 30.2
Total construction (\$5,000 and up).	\$1,897,890	\$1,580,024	- 16.7

Sources: F. W. Dodge Corporation, Statistical Division.

\* The data cover 37 states.

From this tentative analysis it is clear that the proper timing of expansions in public construction programs may well have palpable effects on the course of general business. The experience of the winter of 1929-1930 affords some evidence also that it is possible to overcome administrative difficulties, to accelerate projects already planned, and to hasten the planning and execution of new ones. In the operations of the departments of the federal government, there are many illustrations of changes in procedure that



have advanced construction considerably ahead of the normal schedule. Thus the Supervising Architect of the Treasury Department has increased his staff of architects, engineers, and draftsmen to facilitate the program of public building. It is estimated that federal expenditures for buildings and ground improvements, which amounted to \$31,000,000 in 1928 and \$45,000,000 in 1929, will have increased in 1930 to roughly \$65,000,000. The Department of Justice has been engaged in facilitating the clearing of titles to sites for government buildings and in expediting condemnation proceedings, with the result of a substantial increase in the number of condemnations. The Veterans' Bureau called for bids on hospitals earlier than had been originally planned. The Secretary of Agriculture made allotments of Federal Aid Highway funds to the states several weeks earlier than usual. By legislative enactment, the Federal Aid Highway funds were increased from \$75,000,000 to \$125,000,000 a year during 1931, 1932 and 1933.

No satisfactory appraisal of the effects of various measures of acceleration can be made until some months after the close of 1930, when the statistical record of the whole of that year will have become available. The latest figures to be had as the report passes through the press cover only the first four months of 1930. In comparison with the first four months of 1929, these figures show an increase of thirty per cent in the contracts awarded for public works and utilities. During this same period all other types of construction showed a decline of twenty-seven per cent, residential building being the principal factor in the decrease.



APPENDIX A

TABLE 1.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN ALBANY, NEW YORK, 1919-1928

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928 <sup>a</sup>
Educational buildings.....	\$544	\$295	\$33	\$7	\$1,328	\$207	\$909	\$435 <sup>c</sup>	\$1,557 <sup>c</sup>	\$1,001 <sup>c</sup>
Hospitals and institutions.....	5	187	20	125	21	102	13	1,035	10	1,000
Military and naval buildings.....	.....	15	.....	3	.....	.....	.....	.....	.....	10
Public buildings.....	342	46	2	250	.....	60	.....	81	135	2,557
Waterfront developments.....	62	13	17	.....	65	136	.....	721	644	415
Bridges.....	.....	.....	5	.....	.....	.....	.....	24	.....	13
Incinerators.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Lighting systems.....	.....	.....	.....	.....	550	200	.....	.....	5	.....
Docks and piers.....	.....	.....	.....	.....	.....	.....	.....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Subways and tunnels.....	.....	.....	.....	.....	.....	.....	.....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Sewage systems.....	493	10	2	.....	.....	.....	20	16	21	20
Street paving and road construction	1,519	69	1,135	234	683	511	70	331	1,419	632
Water supply systems.....	.....	.....	65	.....	50	.....	.....	.....	49	445
Parks (public).....	11	.....	.....	.....	.....	.....	.....	.....	.....	15 <sup>c</sup>
<b>Total public construction.....</b>	<b>\$2,976</b>	<b>\$635</b>	<b>\$1,279</b>	<b>\$619</b>	<b>\$2,697</b>	<b>\$1,216</b>	<b>\$1,012</b>	<b>\$2,643</b>	<b>\$3,840</b>	<b>\$6,308</b>
<b>Total public construction (in-</b>										
<b>clusive of private schools and exclu-</b>										
<b>sive of subways, tunnels, docks</b>										
<b>and piers).....</b>	<b>\$2,976</b>	<b>\$635</b>	<b>\$1,279</b>	<b>\$769</b>	<b>\$2,867</b>	<b>\$1,216</b>	<b>\$1,012</b>	<b>\$2,643</b>	<b>\$3,840</b>	<b>\$6,308</b>

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1922 they amounted to \$150,000 and in 1923 to \$170,000. In 1919, 1920, 1921, 1924 and 1925 there were no expenditures for private schools.

<sup>b</sup> Not reported in these three years.

<sup>c</sup> Estimated as one-half total parks.

APPENDIX A

TABLE 2.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN BIRMINGHAM, ALABAMA, 1923-1928  
(In thousands)

Purpose	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$805	\$649	\$1,891	\$445 <sup>a</sup>	\$1,183 <sup>a</sup>	\$717 <sup>a</sup>
Hospitals and institutions.....	258	157	252	174	570	197
Military and naval buildings.....	.....	.....	.....	.....	.....	.....
Public buildings.....	3	26	133	663	459	121
Waterfront developments.....	.....	.....	.....	.....	.....	.....
Bridges.....	.....	.....	318	23	.....	229
Incinerators.....	.....	.....	.....	.....	400	.....
Lighting systems.....	.....	4	914	40	45	12
Docks and piers.....	.....	.....	.....	b	b	b
Subways and tunnels.....	.....	.....	.....	b	b	b
Sewage systems.....	4	326	48	271	483	244
Street paving and road construction.....	271	1,532	2,320	3,712	2,197	2,783
Water supply systems.....	2	.....	32	82	.....	.....
Parks (public).....	.....	.....	3	18 <sup>c</sup>	.....	.....
Total public construction.....	\$1,343	\$2,694	\$5,911	\$5,428	\$5,337	\$4,303
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers).....	\$1,343	\$2,935	\$6,090	\$5,428	\$5,337	\$4,303

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1923 they amounted to 0; in 1924 to \$241,000; and in 1925 to \$179,000.

<sup>b</sup> Not reported in these three years.

<sup>c</sup> Estimated as one-half total parks.

APPENDIX A

TABLE 3.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN BOSTON, MASSACHUSETTS, 1919-1928

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$748	\$720	\$2,998	\$1,160	2,781	\$5,024	\$2,727	\$3,892 *	\$4,891 *	\$1,626 *
Hospitals and institutions.....	392	279	1,269	1,716	520	888	5,259	2,977	2,222	3,997
Military and naval buildings.....	175	273	118	70	18	.....	.....	273	.....	.....
Public buildings.....	499	566	683	615	463	1,166	1,000	920	508	1,069
Waterfront developments.....	132	547	80	235	210	21	436	54	23	125
Bridges.....	527	450	125	1,783	68	1,283	487	1,306	780	292
Incinerators.....	.....	.....	.....	17	.....	.....	13	.....	22	2
Lighting systems.....	83	215	25	150	213	347	150	37	510	13
Docks and piers.....	94	32	3	228	110	203	132	♯	♯	♯
Subways and tunnels.....	477	.....	1,700	.....	.....	.....	.....	♯	♯	♯
Sewage systems.....	601	486	243	802	611	695	635	486	1,152	510
Street paving and road construction	1,532	1,538	554	799	1,745	1,005	1,328	1,751	1,463	1,881
Water supply systems.....	345	122	38	128	212	222	152	319	386	179
Parks (public).....	33	53	13	843	109	30	3	23 *	58 *	18 *
Total public construction.....	\$5,638	\$5,281	\$7,849	\$8,546	\$7,060	\$10,884	\$12,322	\$12,037	\$12,015	\$9,717
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)	\$5,277	\$5,711	\$6,196	\$9,103	\$7,000	\$10,926	\$17,574	\$12,037	\$12,015	\$9,717

Sources: F. W. Dodge Corporation, Statistical Division.

\* Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$210,000; in 1920 to \$468,000; in 1921 to \$50,000; in 1922 to \$785,000; in 1923 to \$50,000; in 1924 to \$245,000; and in 1925 to \$5,394,000.

♯ Not reported in these three years.

\* Estimated as one-half total parks.

APPENDIX A

TABLE 4. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN BUFFALO, NEW YORK, 1919-1928  
(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$884	\$1,205	\$1,270	\$2,684	\$2,715	\$2,382	\$5,040	\$2,063 *	\$3,562 *	\$6,351 *
Hospitals and institutions.....	1,214	3	10	318	45	230	500	2,461	2,261	1,317
Military and naval buildings.....	54	8	....	....	4	....	....	25	22	3
Public buildings.....	28	61	84	100	773	605	123	288	1,109	180
Waterfront developments.....	34	619	....	350	2,200	....	250	1,389	335	493
Bridges.....	549	439	....	10	....	....	3,000	....	43	666
Incinerators.....	....	....	....	....	....	....	459	....	....	....
Lighting systems.....	....	25	8	148	2,048	85	....	....	....	....
Docks and piers.....	129	23	....	50	75	....	1,000	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Subways and tunnels.....	9	....	....	....	....	....	37	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Sewage systems.....	24	17	....	....	28	....	....	38	169	60
Street paving and road construction	688	442	215	55	55	....	15	1,971	5,008	1,546
Water supply systems.....	348	1,449	....	4,000	....	....	....	82	13	8
Parks (public).....	19	5	....	....	....	45	....	....	....	....
Total public construction.....	\$3,980	\$4,296	\$1,587	\$7,715	\$7,943	\$3,347	\$10,424	\$8,317	\$12,522	\$10,624
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)	\$3,923	\$4,273	\$1,797	\$8,480	\$7,948	\$4,032	\$9,507	\$8,317	\$12,522	\$10,624

SOURCE: F. W. Dodge Corporation, Statistical Division.

\* Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$31,000; in 1920 to 0; in 1921 to \$210,000; in 1922 to \$815,000; in 1923 to \$80,000; in 1924 to \$885,000; and in 1925 to \$120,000.

<sup>b</sup> Not reported in these three years.

APPENDIX A

TABLE 5.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN CHICAGO, ILLINOIS, 1919-1928

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$5,266	\$623	\$3,081	\$11,080	\$4,564	\$5,694	\$20,955	\$16,736 *	\$17,715 *	\$22,423 *
Hospitals and institutions.....	1,076	1,345	1,684	1,262	1,981	4,440	6,150	6,567	4,197	5,902
Military and naval buildings....	50	35	5	....	5	160	....	71	108	517
Public buildings.....	69	1,539	5,499	396	49	125	387	4,786	7,204	965
Waterfront developments.....	40	1,149	800	36	390	80	30	119	718	2,905
Bridges.....	4,230	1,264	265	4	1,929	1,676	3,298	3,787	8,674	2,294
Incinerators.....	....	....	....	....	....	15	200	....	788	....
Lighting systems.....	293	42,277	100	315	393	227	1,979	325	250	525
Docks and piers.....	18	....	....	75	....	100	....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Subways and tunnels.....	140	230	....	....	165	400	100	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Sewage systems.....	2,212	1,300	1,200	5,071	980	24	140	2	7,895	6,231
Street paving and road construction.....	393	91	3,031	8,822	322	10,996	2,147	944	440	2,720
Water supply systems.....	40	....	162	....	....	376	3,039	200	1,205	3
Parks (public).....	100	187	....	....	....	....	....	....	....	112 *
Total public construction.....	\$13,927	\$50,040	\$15,827	\$27,061	\$10,778	\$24,313	\$38,425	\$33,537	\$49,194	\$44,597
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers).....	\$13,849	\$50,143	\$16,517	\$27,311	\$11,728	\$26,463	\$67,570	\$33,537	\$49,194	\$44,597

Sources: F. W. Dodge Corporation, Statistical Division.

\* Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$79,300; in 1920 to \$333,000; in 1921 to \$690,000; in 1922 to \$325,000; in 1923 to \$1,115,000; in 1924 to \$2,650,000; and in 1925 to \$29,245,000.

<sup>b</sup> Not reported in these three years.

<sup>c</sup> Estimated as one-half total parks.

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TABLE 6. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN CLEVELAND, OHIO, 1919-1928

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$3,425	\$3,028	\$8,809	\$2,140	\$7,176	\$904	\$3,761	\$3,651 <sup>a</sup>	\$4,470 <sup>a</sup>	\$4,148 <sup>a</sup>
Hospitals and institutions.....	18	856	4,250	23	1,567	320	1,620	2,648	1,679	8,537
Military and naval buildings.....	10	50	200	15	.....	.....	.....	.....	.....	.....
Public buildings.....	23	160	190	623	175	127	1,059	40	58	181
Waterfront developments.....	75	58	107	34	.....	520	582	733	891	160
Bridges.....	526	27	166	5	396	48	490	992	1,252	1,925
Incinerators.....	.....	.....	.....	.....	1,000	.....	.....	.....	.....	.....
Lighting systems.....	13	566	85	60	46	175	751	427	288	155
Docks and piers.....	65	.....	12	.....	32	.....	.....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Subways and tunnels.....	.....	.....	50	.....	140	100	.....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Sewage systems.....	1,735	1,398	488	722	846	1,376	2,103	1,642	2,059	659
Street paving and road construction	3,790	1,321	2,034	1,923	4,790	5,408	7,135	2,497	5,783	3,966
Water supply systems.....	175	331	1,931	60	4,616	1,373	1,024	282	140	18
Parks (public).....	3	.....	.....	.....	.....	.....	.....	<sup>c</sup>	<sup>c</sup>	<sup>c</sup>
Total public construction.....	\$9,858	\$7,795	\$18,322	\$5,605	\$20,784	\$10,351	\$18,525	\$12,912	\$16,620	\$19,749
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)	\$9,840	\$7,835	\$18,899	\$6,112	\$21,286	\$12,056	\$18,805	\$12,912	\$16,620	\$19,749

SOURCE: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$47,000; in 1920 to \$40,000; in 1921 to \$638,500; in 1922 to \$507,000; in 1923 to \$675,000; in 1924 to \$1,805,000; and in 1925 to \$280,000.

<sup>b</sup> Not reported in these three years.

<sup>c</sup> Not reported in these three years. Estimated as zero, on basis of previous years.



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TABLE 7.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN DETROIT, MICHIGAN, 1919-1928

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$3,068	\$3,368	\$9,740	\$3,522	\$1,989	\$4,693	\$4,247	\$11,905 *	\$6,062 *	\$4,769 *
Hospitals and institutions.....	1,062	158	637	154	20	2,418	1,227	1,007	5,402	2,938
Military and naval buildings.....	.....	.....	.....	.....	.....	.....	.....	9	.....	.....
Public buildings.....	157	222	1,471	170	877	253	391	715	1,189	848
Waterfront developments.....	103	8	.....	139	25	.....	26	156	107	121
Bridges.....	.....	1,000	3,057	53	216	400	125	325	2,318	8,014
Incinerators.....	.....	.....	.....	.....	.....	33	.....	6	76	.....
Lighting systems.....	583	85	290	353	50	470	887	204	750	125
Docks and piers.....	.....	6	25	186	.....	80	7	b	b	b
Subways and tunnels.....	75	3,315	.....	.....	.....	20	.....	b	b	b
Sewage systems.....	4,296	2,501	10,285	2,409	200	422	3,029	6,766	6,742	8,071
Street paving and road construction	2,863	1,513	2,039	685	1,179	1,943	7,392	11,398	10,896	6,659
Water supply systems.....	199	1,000	1,282	687	5,508	87	75	3,507	3,485	1,928
Parks (public).....	20	30	.....	.....	.....	.....	.....	18 °	500 °	3 °
Total public construction.....	\$12,426	\$13,206	\$28,826	\$8,358	\$10,064	\$10,819	\$17,406	\$36,016	\$37,527	\$33,476
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers).....	\$12,550	\$9,993	\$28,975	\$12,822	\$10,544	\$12,152	\$20,061	\$36,016	\$37,527	\$33,476

Source: F. W. Dodge Corporation, Statistical Division.

\* Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$199,000; in 1920 to \$108,000; in 1921 to \$174,000; in 1922 to \$4,650,000; in 1923 to \$480,000; in 1924 to \$1,432,500; and in 1925 to \$2,662,700.

° Not reported in these three years.

b Estimated as one-half total parks.

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TABLE 8—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN HOUSTON, TEXAS, 1925-1928

(In thousands)

	<i>Purpose</i>	<i>1925</i>	<i>1926</i>	<i>1927</i>	<i>1928</i>
	Educational buildings <sup>a</sup> .....	\$2,810	\$1,640	\$836	\$2,152
	Hospitals and institutions.....	....	95	212	110
	Military and naval buildings.....	100	....	....	613
	Public buildings.....	172	863	111	63
	Waterfront developments.....	54	....	....	1,000
	Bridges.....	374	68	351	81
	Incinerators.....	15	....	....	60
190	Lighting systems.....	49	....	....	261
	Docks and piers.....	1,353	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
	Subways and tunnels.....	....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
	Sewage systems.....	88	381	1,264	1,514
	Street paving and road construction.....	298	1,209	2,278	1,691
	Water supply systems.....	320	235	153	102
	Parks (public).....	....	....	....	....
	<b>Total public construction.....</b>	<b>\$5,633</b>	<b>\$4,491</b>	<b>\$5,205</b>	<b>\$7,647</b>
	<b>Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers).....</b>	<b>\$4,280</b>	<b>\$4,491</b>	<b>\$5,205</b>	<b>\$7,647</b>

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Includes private schools.

<sup>b</sup> Not reported in these three years.

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TABLE 9—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN INDIANAPOLIS, INDIANA, 1919-1928

(In thousands)

<i>Purpose</i>	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$813	\$2,058	\$1,292	\$130	\$1,433	\$302	\$1,006	\$3,958 *	\$3,480 *	\$1,244 *
Hospitals and institutions.....	346	42	195	2,664	205	440	790	710	1,679	1,050
Military and naval buildings.....	.....	.....	.....	.....	.....	.....	400	.....	.....	18
Public buildings.....	12	16	.....	.....	25	143	22	89	97	14
Waterfront developments.....	5	.....	38	.....	783	.....	.....	.....	517	4
Bridges.....	14	.....	13	20	60	925	82	398	815	435
Incinerators.....	.....	.....	.....	.....	375	80	.....	.....	.....	.....
Lighting systems.....	50	.....	12	54	16	125	200	67	.....	360
Docks and piers.....	.....	.....	.....	.....	.....	.....	.....	b	b	b
Subways and tunnels.....	.....	.....	.....	.....	.....	.....	.....	b	b	b
Sewage systems.....	2,045	100	401	750	2	209	415	501	2,094	773
Street paving and road construction	446	545	896	1,761	385	652	2,341	1,363	3,671	2,529
Water supply systems.....	.....	83	.....	500	.....	5	800	426	.....	.....
Parks (public).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<b>Total public construction.....</b>	<b>\$3,731</b>	<b>\$2,844</b>	<b>\$2,847</b>	<b>\$5,879</b>	<b>\$3,284</b>	<b>\$2,881</b>	<b>\$6,056</b>	<b>\$7,512</b>	<b>\$12,353</b>	<b>\$6,427</b>
<b>Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)</b>	<b>\$3,738</b>	<b>\$3,094</b>	<b>\$2,852</b>	<b>\$5,984</b>	<b>\$3,284</b>	<b>\$2,881</b>	<b>\$6,186</b>	<b>\$7,512</b>	<b>\$12,353</b>	<b>\$6,427</b>

SOURCE: F. W. Dodge Corporation, Statistical Division.

\* Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$6,600; in 1920 to \$250,000; in 1921 to \$5,000; in 1922 to \$105,000; in 1923 to 0; in 1924 to 0; and in 1925 to \$130,000.

b Not reported in these three years.

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TABLE 10.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN NEWARK, NEW JERSEY, 1919-1928  
(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$464	\$1,883	\$1,447	\$913	\$832	\$1,414	\$1,772	\$839 <sup>a</sup>	\$110 <sup>a</sup>	\$1,854 <sup>a</sup>
Hospitals and institutions.....	.....	17	56	329	2,730	95	376	2,638	762	138
Military and naval buildings.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Public buildings.....	127	167	962	40	223	28	20	2,936	18	894
Waterfront developments.....	.....	60	739	297	96	70	198	266	257	26
Bridges.....	301	95	31	5	15	11	50	2,374	1,215	59
Incinerators.....	.....	.....	.....	.....	.....	.....	.....	.....	8	.....
Lighting systems.....	.....	44	5	10	200	110	120	.....	.....	30
Docks and piers.....	116	950	.....	25	.....	35	300	b	b	b
Subways and tunnels.....	.....	.....	.....	.....	.....	.....	.....	b	b	b
Sewage systems.....	267	50	146	171	162	98	326	86	844	515
Street paving and road construction	630	1,023	164	385	665	747	1,379	1,163	2,833	4,191
Water supply systems.....	3	.....	.....	.....	34	.....	.....	22	400	181
Parks (public).....	.....	.....	.....	.....	.....	68	.....	46 <sup>c</sup>	.....	15 <sup>c</sup>
Total public construction.....	\$1,911	\$4,289	\$3,550	\$2,175	\$4,957	\$2,676	\$4,541	\$10,370	\$6,447	\$7,903
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)	\$1,895	\$3,339	\$3,765	\$2,274	\$6,037	\$2,781	\$4,423	\$10,370	\$6,447	\$7,903

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$100,000; in 1920 to 0; in 1921 to \$215,000; in 1922 to \$124,000; in 1923 to \$1,080,000; in 1924 to \$140,000; and in 1925 to \$182,000.

<sup>b</sup> Not reported in these three years.

<sup>c</sup> Estimated as one-half total parks.

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TABLE 11.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN NEW HAVEN, CONNECTICUT, 1919-1928  
(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$762	....	\$1,773	\$356	\$1,900	\$139	\$6,083	\$3,401 *	\$7,765 *	\$1,167 *
Hospitals and institutions.....	445	\$22	265	410	580	475	....	....	32	516
Military and naval buildings.....	....	....	....	....	....	15	....	....	....	700
Public buildings.....	1	7	80	126	28	....	27	....	30	35
Waterfront developments.....	45	....	36	12	....	....	....	....	44	33
Bridges.....	198	....	98	420	95	....	49	13	10	....
Incinerators.....	....	....	....	....	....	....	....	....	....	....
Lighting systems.....	....	....	....	12	22	5	100	17	167	25
Docks and piers.....	....	....	....	....	....	....	....	b	b	b
Subways and tunnels.....	....	....	....	....	....	....	....	b	b	b
Sewage systems.....	178	63	14	158	130	144	66	23	15	16
Street paving and road construction	91	220	371	100	293	309	217	152	301	543
Water supply systems.....	....	....	....	....	....	....	12	....	....	5
Parks (public).....	....	....	....	....	....	....	....	....	13 °	5 *
Total public construction.....	\$1,720	\$312	\$2,637	\$1,594	\$3,048	\$1,087	\$6,554	\$3,606	\$8,377	\$3,045
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)	\$1,728	\$637	\$2,637	\$3,524	\$3,198	\$1,257	\$7,994	\$3,606	\$8,377	\$3,045

Sources: F. W. Dodge Corporation, Statistical Division.

\* Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$7,200; in 1920 to \$325,000; in 1921 to 0; in 1922 to \$1,930,000; in 1923 to \$150,000; in 1924 to \$170,000; and in 1925 to \$1,440,000.

° Not reported in these three years.

\* Estimated as one-half total parks.

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TABLE 12.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN NEW ORLEANS, LOUISIANA, 1923-1928  
(In thousands)

Purpose	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$831	\$1,585	\$858	\$1,250 <sup>a</sup>	\$1,325 <sup>a</sup>	\$1,638 <sup>a</sup>
Hospitals and institutions.....	1,029	2,179	677	657	239	206
Military and naval buildings.....	.....	.....	.....	.....	.....	.....
Public buildings.....	.....	98	17	12	40	129
Waterfront developments.....	331	372	2,285	.....	94	110
Bridges.....	452	732	184	5,000	53	30
Incinerators.....	.....	.....	.....	.....	.....	460
Lighting systems.....	331	26	135	45	.....	.....
Docks and piers.....	1,787	2,669	752	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Subways and tunnels.....	25	.....	.....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Sewage systems.....	50	.....	.....	200	.....	557
Street paving and road construction.....	3,990	1,036	680	582	.....	75
Water supply systems.....	.....	2,098	.....	10	.....	10
Parks (public).....	.....	10	.....	.....	39 <sup>c</sup>	.....
Total public construction.....	\$8,826	\$10,805	\$5,588	\$7,756	\$1,790	\$3,215
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)	\$8,249	\$9,449	\$5,008	\$7,756	\$1,790	\$3,215

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1923 they amounted to \$1,235,000; in 1924 to \$1,313,000; and in 1925 to \$172,000.

<sup>b</sup> Not reported in these three years.  
<sup>c</sup> Estimated as one-half total parks.

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TABLE 13.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN NEW YORK, NEW YORK, 1919-1928  
(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$6,429	\$13,440	\$9,464	\$22,368	\$39,088	\$46,982	\$17,215	\$26,387 <sup>a</sup>	\$27,186 <sup>a</sup>	\$40,967 <sup>a</sup>
Hospitals and institutions...	3,239	7,199	8,266	14,647	6,516	10,790	13,711	17,049	16,838	19,434
Military and naval buildings	3,382	1,658	108	128	214	29	1,351	632	566	1,743
Public buildings.....	304	7,475	1,329	2,551	1,078	7,407	4,774	1,364	3,597	5,872
Waterfront developments...	3,205	839	4,535	1,216	1,641	1,000	323	950	2,515	955
Bridges.....	....	2,227	24	434	23	75	5,908	13,637	27,082	3,646
Incinerators.....	102	232	....	17	170	1,247	25	150	1,104	1,261
Lighting systems.....	131	1,730	1,150	2,371	1,736	715	1,207	10,330	1,426	1,308
<sup>Set</sup> Docks and piers.....	1,811	21,691	821	602	570	14	548	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Subways and tunnels.....	254	650	....	21,524	4,309	....	60,281	65,000 <sup>c</sup>	75,000 <sup>c</sup>	80,000 <sup>c</sup>
Sewage systems.....	7,300	5,468	297	1,057	142	35	850	5,000	8,066	5,212
Street paving and road construction.....	8,824	15,863	6,756	6,593	1,047	35	44	7,189	24,184	19,711
Water supply systems.....	491	886	93	744	178	529	60	833	2,424	45,393
Parks (public).....	42	162	70	....	277	20	....	100 <sup>d</sup>	399 <sup>d</sup>	374 <sup>d</sup>
Total public construction...	\$35,514	\$79,520	\$32,913	\$74,252	\$56,989	\$68,878	\$106,297	\$148,621	\$190,387	\$225,876
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers).	\$34,412	\$58,033	\$34,987	\$57,450	\$55,593	\$82,713	\$53,769	\$83,621	\$115,387	\$145,876

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$963,000; in 1920 to \$854,000; in 1921 to \$2,895,000; in 1922 to \$5,324,000; in 1923 to \$3,483,200; in 1924 to \$13,849,000; and in 1925 to \$8,301,000.

<sup>b</sup> Not reported in these three years.

<sup>c</sup> Estimated on basis of Board of Transportation figures, and Dodge figures of subway, tunnel and railroad construction.

<sup>d</sup> Estimated as one-half total parks.

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TABLE 14. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN PHILADELPHIA, PENNSYLVANIA, 1919-1928

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$470	\$1,618	\$1,802	\$5,626	\$5,200	\$5,422	\$9,004	\$11,952 <sup>a</sup>	\$13,766 <sup>a</sup>	\$9,197 <sup>a</sup>
Hospitals and institutions.....	381	652	2,135	3,207	377	3,360	6,416	4,354	6,914	8,906
Military and naval buildings.....	1,018	1,849	75	284	260	14	216	128	141	123
Public buildings.....	509	25	279	320	400	315	1,038	2,692	1,664	243
Waterfront developments.....	1,121	197	221	897	525	2,884	472	242	412	1,879
Bridges.....	373	294	2,704	2,434	1,906	11,906	....	4,109	2,829	5,204
Incinerators.....	....	....	5	....	164	....	7	408	....	50
Lighting systems.....	10	172	207	211	55	330	5	100	2,140	1,520
Docks and piers.....	4,525	18	1,418	2,436	36	40	50	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Subways and tunnels.....	57	50	233	181	1,203	27,700	11	<sup>c</sup>	<sup>c</sup>	<sup>c</sup>
<sup>1928</sup> Sewage systems.....	307	....	2,500	2,005	747	2,122	1,305	2,140	7,196	2,995
Street paving and road construction	1,312	3,619	5,724	1,981	1,431	1,847	723	3,025	6,508	7,734
Water supply systems.....	169	479	1,951	142	60	282	214	1,154	182	362
Parks (public).....	18	....	159	138	35	56	123	90 <sup>d</sup>	13 <sup>d</sup>	8 <sup>d</sup>
Total public construction.....	\$10,270	\$8,973	\$19,413	\$19,862	\$12,399	\$56,278	\$19,584	\$30,394	\$41,765	\$38,221
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers).....	\$5,738	\$9,040	\$18,156	\$19,475	\$12,298	\$30,934	\$21,229	\$30,394	\$41,765	\$38,221

SOURCE: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$50,000; in 1920 to \$135,000; in 1921 to \$394,000; in 1922 to \$2,230,800; in 1923 to \$1,138,200; in 1924 to \$2,396,500; and in 1925 to \$1,705,700.

<sup>b</sup> Not reported in these three years.

<sup>c</sup> Not reported in these three years. (Expenditures from loan funds for construction, improvement and equipment of subways, as reported in Comptroller's reports, amounted in 1919 to \$2,610,093; in 1920 to \$1,747,645; in 1921 to \$2,591,890; in 1922 to \$5,120,112; in 1923 to \$207,541; in 1924 to \$3,316,456; in 1925 to \$30,567,107; in 1926 to \$24,185,365; and in 1927 to \$18,966,420.)

<sup>d</sup> Estimated as one-half total parks.



APPENDIX A

TABLE 15. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN ROCHESTER, NEW YORK, 1919-1928  
(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$1,239	\$1,332	\$836	\$3,040	\$272	\$644	\$216	\$1,736 *	\$2,301 *	\$3,051 *
Hospitals and institutions.....	167	1	255	145	1,934	2,030	500	13	1,189	2,292
Military and naval buildings.....	4	4	49	....	....	....	10	....	....	....
Public buildings.....	72	10	8	54	....	250	450	16	31	7
Waterfront developments.....	662	861	15	1,806	....	....	....	510	....	....
Bridges.....	5	500	65	10	....	5	....	....	....	....
Incinerators.....	....	....	....	....	....	10	....	....	....	....
Lighting systems.....	....	....	....	....	231	105	2,929	....	30	11
Docks and piers.....	....	....	....	24	....	....	....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Subways and tunnels.....	....	16	....	....	2,000	....	1,938	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Sewage systems.....	239	....	97	202	82	43	35	215	387	162
Street paving and road construction	498	65	93	580	128	127	468	944	1,875	1,087
Water supply systems.....	....	....	....	....	2	....	....	....	1,000	....
Parks (public).....	....	....	....	....	....	....	....	....	....	....
<b>Total public construction.....</b>	<b>\$2,886</b>	<b>\$2,789</b>	<b>\$1,418</b>	<b>\$5,861</b>	<b>\$4,649</b>	<b>\$3,214</b>	<b>\$6,546</b>	<b>\$3,434</b>	<b>\$6,813</b>	<b>\$6,610</b>
<b>Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)</b>	<b>\$2,886</b>	<b>\$2,873</b>	<b>\$1,468</b>	<b>\$6,357</b>	<b>\$2,669</b>	<b>\$4,547</b>	<b>\$4,858</b>	<b>\$3,434</b>	<b>\$6,813</b>	<b>\$6,610</b>

Sources: F. W. Dodge Corporation, Statistical Division.

\* Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to 0; in 1920 to \$100,000; in 1921 to \$50,000; in 1922 to \$520,000; in 1923 to \$20,000; in 1924 to \$1,333,000; and in 1925 to \$250,000.

<sup>b</sup> Not reported in these three years.

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TABLE 16.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN ST. LOUIS, MISSOURI, 1919-1928  
(In thousands)

<i>Purpose</i>	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$778	\$758	\$1,187	\$3,101	\$2,682	\$712	\$1,494	\$2,997 <sup>a</sup>	\$2,507 <sup>a</sup>	\$1,806 <sup>a</sup>
Hospitals and institutions.....	391	718	507	2,702	584	1,650	146	2,605	752	4,459
Military and naval buildings.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Public buildings.....	44	65	94	157	45	.....	314	1,375	5,260	209
Waterfront developments.....	.....	8	.....	.....	58	30	.....	1,232	.....	.....
Bridges.....	18	.....	23	.....	768	.....	105	341	153	1,256
Incinerators.....	.....	.....	.....	70	.....	.....	.....	.....	.....	15
Lighting systems.....	.....	.....	.....	35	15	530	103	1,900	948	2,731
Docks and piers.....	.....	.....	.....	.....	.....	.....	.....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Subways and tunnels.....	.....	.....	.....	.....	.....	.....	.....	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>
Sewage systems.....	36	407	225	9	313	1,951	2,323	629	3,891	2,741
Street paving and road construction	443	1,242	888	1,964	2,447	1,577	2,078	4,113	3,524	4,820
Water supply systems.....	.....	9	14	440	.....	.....	.....	.....	470	.....
Parks (public).....	.....	.....	.....	.....	.....	.....	.....	75 <sup>c</sup>	.....	.....
Total public construction.....	\$1,710	\$3,207	\$2,938	\$3,478	\$6,912	\$6,450	\$6,563	\$15,267	\$17,505	\$18,037
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)	\$1,720	\$3,257	\$3,018	\$9,168	\$8,147	\$9,525	\$6,951	\$15,267	\$17,505	\$18,037

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$10,000; in 1920 to \$50,000; in 1921 to \$80,000; in 1922 to \$690,000; in 1923 to \$1,235,000; in 1924 to \$3,075,000; and in 1925 to \$388,000.

<sup>b</sup> Not reported in these three years.

<sup>c</sup> Estimated as one-half total parks.

APPENDIX A

TABLE 17.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN ST. PAUL, MINNESOTA, 1919-1928

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Educational buildings.....	\$128	\$155	\$1,285	\$855	\$1,220	\$879	\$554	\$661 *	\$758 *	\$469 *
Hospitals and institutions.....	5	360	455	26	245	415	1,195	8	411	55
Military and naval buildings.....	....	....	50	....	....	....	....	....	30	....
Public buildings.....	40	19	9	2	....	92	66	....	98	12
Waterfront developments.....	....	....	....	....	....	....	46	....	....	....
Bridges.....	....	51	....	33	100	2,000	....	....	17	....
Incinerators.....	....	....	....	....	....	....	....	....	....	....
Lighting systems.....	7	84	45	18	9	....	....	....	....	12
Docks and piers.....	....	....	....	....	....	....	....	b	b	b
Subways and tunnels.....	....	....	5	....	....	....	....	b	b	b
Sewage systems.....	3	30	427	126	280	472	20	66	259	264
Street paving and road construction	5	16	626	189	780	434	127	314	355	613
Water supply systems.....	....	....	880	....	40	....	....	25	45	....
Parks (public).....	....	....	....	....	....	....	....	....	....	....
<b>Total public construction.....</b>	<b>\$181</b>	<b>\$638</b>	<b>\$3,821</b>	<b>\$1,276</b>	<b>\$2,683</b>	<b>\$4,301</b>	<b>\$2,008</b>	<b>\$1,074</b>	<b>\$1,973</b>	<b>\$1,425</b>
<b>Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)</b>	<b>\$221</b>	<b>\$703</b>	<b>\$3,908</b>	<b>\$1,501</b>	<b>\$3,278</b>	<b>\$4,526</b>	<b>\$2,287</b>	<b>\$1,074</b>	<b>\$1,973</b>	<b>\$1,425</b>

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Source: F. W. Dodge Corporation, Statistical Division.

\* Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these three years. In 1919 they amounted to \$40,000; in 1920 to \$65,000; in 1921 to \$92,000; in 1922 to \$225,100; in 1923 to \$595,000; in 1924 to \$225,000; and in 1925 to \$279,000.

b Not reported in these three years.

## APPENDIX B

### NOTES ON TABLES 5-9, CHAPTER II, PP. 23-33

#### *Departments Covered and Purpose of Expenditures in New York City*

##### *From Special Revenue Bond Fund:*

Armory Board — Construction and reconstruction of Armories. (This is the only case in which Special Revenue Bonds are issued in the city for capital improvements, aside from certain street paving work in railroad areas.)

Presidents, Five Boroughs — Paving and repaving streets and avenues. (Now financed out of tax budget appropriations.)  
(New Municipal Airport — 1929)

##### *From Corporate Stock, Serial Bonds and Assessment Bond Fund; and Tax Note Fund:*

Armory Board — Armories.

Department of Public Welfare — Hospitals, nurses' homes, clinics and nearby adjuncts.

County Court House, Manhattan.

Department of Plant and Structures — Construction of ferryboats; erection of ferry terminals, operating slips, etc., construction of waterfront and inland reclamation stations and of rubbish disposal plants; construction and paving, etc. of bridges.

Department of Public Markets — Terminal Markets.

Department of Correction — Jails, workhouses, reformatories, penitentiaries, houses of detention.

Board of Education — Schools, high, technical and trade schools, playgrounds and athletic fields.

City College — Commerce Building.

Board of Higher Education — Construction of new Hunter College Center.

Public Libraries and branch libraries — Construction of new Brooklyn Central Library.

Department of Parks — Five Boroughs — Improvement of parks, and construction, reconstruction, equipment, etc. of park buildings:

Manhattan: American Museum of Natural History; Boat Houses, Central Park; Metropolitan Museum; Paving and repaving drives in Central Park; Construction of new parks and playgrounds; Extensions of existing parks; Riverside Drive Park improvements; Improvement of Harlem River Driveway, etc.

Brooklyn: Greenhouses, shelter houses, comfort stations, etc. Picnic houses; Equipment of playgrounds; Repaving drives in parks, etc. Construction and extension of parks and beaches; Brooklyn Institute and Museum of Arts and Sciences, etc.

Bronx: Botanical Gardens buildings, etc. Golf courses, construction and improvement of parks and playgrounds. Comfort stations, bath houses and other structures in parks; paving and repaving in parks, etc.

Queens and  
Richmond: Construction of walks and drives, of comfort stations and other buildings, etc. Construction and extension of parks, beaches

and playgrounds, and golf courses.

- Westchester County Park Commission — Construction of Bronx River Parkway.
- Department of Health — New hospitals, additions and extensions to Bellevue and Allied Hospitals.
- Police Department — Station houses.
- Department of Street Cleaning — Dumps, buildings, garages, refuse disposal plants and floating equipment.
- Presidents, Five Boroughs — Erection of miscellaneous buildings, — court houses, municipal buildings, public bath houses, libraries, garages, asphalt plant, sewage disposal plants, comfort stations, etc. Repaving and improving streets and avenues a large part of the total.
- Board of Water Supply — Construction of new water supply system for New York City. Delivery tunnel from Hillview Reservoir to Bronx, Queens and Brooklyn; sewage disposal plants in watersheds.
- Department of Water Supply, Gas and Electricity — Construction and equipment of water supply systems; largely laying, relaying, extending and improving water mains, trunk main appurtenances, pumping stations, reconstruction of aqueducts. Gas and electricity construction work of minor importance.
- Department of Docks — Construction and improvement of docks; bay improvements; construction and equipment of piers, sheds, embankments, basins, bulkheads, etc.
- Fire Department — Fire alarm offices, engine houses, central offices; extension and modernizing of fire alarm systems, fire boats.
- Board of Transportation — Construction and equipment of subway lines, yards, sub-station power plants, etc. (Relatively small expenditures on Brooklyn-Richmond Tunnel also included in this group).
- Street Improvement Fund — Assessable Improvements — Road construction, regulating, grading and paving of streets, highways and roads, laying curbs, sidewalks, drainage systems, including trunk and lateral sewers; construction of public beaches and boardwalks; reconstruction of roads, express highways, new arterial streets.

*From Special Accounts:*

- Presidents, Five Boroughs — Construction of Library Building, City College. Restoring and repaving streets.

*From Current Revenue:*

- Restoring and Resurfacing Streets — These are properly not figures for expenditures, but budget appropriations. They are, however, a sufficiently accurate representation of the actual amounts spent for this purpose during these years. (They are amounts paid by private contractors, in some instances, and by city departments for the restoration of streets when opened to install or repair a subsurface structure).

## APPENDIX C

### NOTES TO CHAPTER II: FINANCIAL PROCEDURE IN NEW YORK CITY

The financial accounts of the city, which include, of course, the counties contained within the city, can be readily classified under the following headings:

1. — Tax Budget Fund Accounts
2. — General Fund Accounts
3. — Special Revenue Bond Fund Accounts
4. — Tax Note Accounts
5. — Corporate Stock and Serial Bond Fund Accounts
6. — Assessment Bond Fund Account
7. — Special Fund Accounts
8. — Trust Fund Accounts
9. — Sinking Fund Accounts

#### 1 — TAX BUDGET FUND ACCOUNTS

The Budget of the City of New York is adopted by the Board of Estimate and Apportionment at the end of each October, and includes appropriations for the operation and maintenance of the city government, and the county governments within the city, including Debt Service charges and taxes imposed by the state upon the counties contained within the city. This budget is then submitted to the Board of Aldermen (often called in other cities the Common Council) for its consideration, and in considering it the Board of Alderman can only reduce or eliminate certain specific appropriations, subject, of course, to the veto power of the Mayor. After this action has been consummated, the appropriations become effective as of the first of the calendar year, which co-ordinates with our fiscal year, and soon thereafter these "A" vouchers make their appearance for payment.

As the tax rate is not fixed until the first Monday in March, and as the first half of the taxes are not collected until the first of May, it becomes necessary for the corporation to borrow money to meet its expenses in the interim. This it does through the medium of Revenue Bonds or Revenue Bills.

#### 2 — GENERAL FUND ACCOUNTS

About February 15th the Comptroller submits to the Board of Aldermen his statement of the estimated amount of the General Fund for the Reduction of Taxation. This amount is deducted from the budget total and the balance is the theoretical amount to be collected in taxes. About the same time the Department of Taxes and Assessments submits a certified statement to the Board of Alderman, and also the tax rolls showing the assessed valuation of taxable real and personal property. With these three amounts available the tax rate can be easily figured and is carried out to eight decimal places on the dollar.

When the Comptroller submits his statement of the General Fund Revenues he also advises the Board of Alderman as to the amount of special assessments collectible for the current year from the city and boroughs, the borough and county lines being co-terminus.

#### 3 — SPECIAL REVENUE BOND FUND ACCOUNTS

These appropriations are supplemental to the tax budget appropriations and they are issued under the subdivisions of Section 188 of the Charter and other special laws

which are too numerous to mention here. These bonds when issued are redeemed in the budget succeeding the year of their issue. In some instances the Comptroller, particularly in regard to mandatory charges, claims, etc., is empowered to sell these bonds without the approval of any other board or body. In other instances, however, he must receive the approval of the Board of Estimate and Apportionment, upon the recommendation of the Board of Aldermen, or the Board of Estimate and Apportionment only.

For the removal of snow, these bonds are issued under the provisions of Section 546 of the Charter which provides for their redemption. Section 229 of the Charter makes it a mandatory obligation upon the Board of Estimate and Apportionment to redeem all special revenue bonds.

Special Revenue bonds are not issued until the payments are required, and then usually in large blocks. The time, the rate and the amount is determined solely by the Comptroller, the issues being limited by the amounts of the authorizations.

#### 4 — TAX NOTE ACCOUNTS

Near the end of Section 189 of the Greater New York Charter is that provision of law which lays down a pay-as-you-go policy upon the City of New York. That is to say, no long-term bonds can be issued, except in certain cases for any other than a revenue producing improvement. Therefore, the Board of Estimate and Apportionment from time to time authorizes non-revenue-producing public improvements under the provisions of Section 189 of the Charter. These funds are authorized only by the Board of Estimate and Apportionment. The issue of these notes follows exactly the same procedure as Special Revenue Bonds, and they are redeemed in the same way in the budget succeeding the year of their issue. As the vouchers are received for payment the Comptroller, without any further approval, sells blocks of these tax notes to the bankers at such rates of interest, in such amounts and at such times as he believes to be to the best interests of the city, limited, of course, to the total amount authorized.

Likewise, there is provided in the budget for each year a sum of money to pay the interest on these revenue bills, special revenue bonds and tax notes.

#### 5 — CORPORATE STOCK AND SERIAL BOND FUND ACCOUNTS

These bonds, which are long-term bonds, are authorized by the Board of Estimate and Apportionment, in some instances alone, in others upon the recommendation of the Commissioners of the Sinking Fund and in others with the concurrence of the Board of Alderman. These bonds are authorized and issued under the provisions of Sections 47, 169, 189 (showing the manner in which they are issued), 176, 178 (Water) and 180 (Docks). Under the authority of special acts of the State Legislature, which are not included in the City Charter, the Board of Estimate and Apportionment may authorize the issuance of corporate stock for specific projects, such as rapid transit railroads, new water supply systems located outside the city as distinct from the extension of the water supply system within the city, and for other projects which need not be commented upon at this time.

As the vouchers chargeable to these authorizations are received, corporate stock notes are issued in blocks at such rates, in such amounts and for such periods as the Comptroller may determine to be in the best interests of the city. At a later period, when the money market is favorable, the Comptroller requests the Sinking Fund to fix the rate of interest on the long term bonds to be sold. This is usually done upon his recommendation both as to the rate of interest and the amount of the bonds to be sold. When the bonds have been sold to the public, or to the city's own sinking funds or pension funds, the corporate stock notes are taken up by the proceeds of the corporate stock. The premium on the bonds is diverted to the General Fund for the Reduc-

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tion of Taxation. For their ultimate redemption there is provided annually in the budget an amortization amount to the Sinking Fund on account of the outstanding corporate stock. The appropriation for the redemption of serial bonds is not made to the Sinking Funds, as their pro rata part must be redeemed each year. The respective amounts are definitely known and the total amount is carried in the budget in Code 3019. Corporate stock is redeemed through the sinking funds while serial bonds are redeemed, in a pro rata part, through a direct budgetary appropriation.

### 6 — ASSESSMENT BOND FUND ACCOUNT

For the purpose of showing the present layout of the city and the layout of the undeveloped sections in the future, there is an official City Map which can be altered only after a public hearing. When it is desired to acquire lands for a park, parkway, street or avenue, petition is made by the local board or boards of the Borough President to the Board of Estimate and Apportionment. After a public hearing the Corporation Counsel is directed to institute condemnation proceedings, and the Borough President submits a rule map showing the property to be acquired, and a damage map showing the individual parcels included in the rule map, which are forwarded to the Corporation Counsel as a basis of the condemnation proceedings. In the meantime a map showing the area of assessment is prepared by the Chief Engineer of the Board of Estimate and Apportionment and submitted to the Board of Estimate and Apportionment for its approval, showing the area to be assessed for the acquisition of the property in question. With these maps before it, the Court, after hearing both sides interested, makes tentative awards. After hearing objections final awards are made. To assist the Court in determining the award, the interest on the property from the date title vested, the total amount to be assessed, and finally the spreading of this amount as an assessment over the various parcels of property affected, there is assigned from the Corporation Counsel's office a staff of clerks, computers and engineers, which is called the Bureau of Street Openings.

After title to the land for streets, parkways and avenues has vested in the City, either through condemnation or dedication, request is made by the local board or boards of the Borough President to the Board of Estimate and Apportionment for the physical improvement thereof, whether it be a drainage system, trunk or lateral sewers, temporary or permanent pavement, regulating, grading, curbing or flagging. The Board of Estimate and Apportionment then gives preliminary authorization to the Borough President under whose control this work falls. He prepares his contract, plans and specifications for the work in question, and then advises the Board of its estimated cost. Approval is then granted and the work performed. The cost of the work, both preliminary and final, and the interest on the money outlaid, is certified to the Board of Assessors, which lays out an area of assessment and apportions the assessment on the various parcels of property benefited. As there are many of these proceedings, this Board of Assessors holds hearings on the area of assessment which differ from those for the acquisition of the property.

To finance these assessable improvements, the city occupies the dual capacity of Trustee and Banker, and as the Banker it has established two assessment funds called, respectively, the "Fund for Street and Park Openings" and the "Fund for Street Improvements." The acquisition of property is financed through the medium of the former assessment fund and the physical improvements through the latter fund. These two funds, which are revolving and are the main holding accounts, have likewise subsidiary accounts showing particular projects.

The awards for the acquisition of property, the payment of the salaries of the clerks and engineers in the Bureau of Street Openings and the engineering forces in the Borough President's office assigned to these projects, the payment to the contractors for the physical work and other incidental expenses are paid in advance out of these funds. Later these funds are recouped by the assessments paid to the Comptroller's



office, which receives, after the assessments have been confirmed by the Court in the acquisition proceedings and by the Board of Assessors in the street improvement proceedings, a duly certified assessment roll showing the amounts to be collected on the various parcels of property benefited.

In order to assist in the financing of these two accounts the Comptroller is authorized by the Board of Estimate and Apportionment, in accordance with the provisions of Sections 174, 181 and 184 of the Greater New York Charter, to issue ten-year assessment bonds whose redemption is to be effected through the medium of these two funds. However, assessments are cancelled, reduced and imposed upon city property, and to replenish these two funds for this share of the expense, the Board authorizes ten-year corporate stock which becomes a part of the city debt. These assessment bonds are also part of the city debt, as they are borrowed on the city's credit, but they have a contingent asset in the outstanding and unpaid assessments. These bonds are issued at such times and in such amounts as the Comptroller deems advisable, restricted, however, to the total amount of the authorization given by the Board of Estimate and Apportionment. Practically all of these bonds are bought by the city's own sinking funds.

Special assessments for local improvements spread over a borough or boroughs of the city are financed in the same manner as other improvements except that their collections are made with the annual tax rate. Sometimes they are collected in equal partial payments for various periods up to five years. This procedure is found in Section 247 of the Charter. These amounts are credited to the respective assessment funds.

#### **7 — SPECIAL FUND ACCOUNTS**

The law provides that all the revenues of the City of New York must go into the General Fund for the Reduction of Taxation, unless specifically provided by law to be diverted to the respective sinking funds or to be used for a specific purpose. It is to these last mentioned accounts that the special funds relate. They are revenues received for the use of armories, revenues derived from two of the large city bridges, tuition fees at certain colleges and schools, water revenues of a certain part of the water system and amounts received from plumbers and others for the opening of streets where pavements are restored by the Borough Presidents out of these funds and others which become self-evident by reference to the title of the account. No certificates of indebtedness are issued on account of these funds, payments being made out of the actual cash received.

#### **8 — TRUST FUND ACCOUNTS**

Trust Fund Accounts cover funds held by the city in trust for some individual or corporation, such as Unclaimed Salaries and Wages, Intestate Estates, etc. Payments are made out of these accounts by the Comptroller without the issuance of bonds, as payment can be made only from cash in hand.

#### **9 — SINKING FUND ACCOUNTS**

There are seven sinking funds, one of which while named a sinking fund, is not such in fact, as it merely accumulates funds for the payment of interest on the debt of the old City of New York. This is the "Sinking Fund for the Payment of Interest on the City Debt." Into these respective accounts flow the miscellaneous revenues pledged by law and, in addition, the annual amortization appropriations included in the tax budget of each year — see Codes 3014 and 3015 of the Annual Budget. This last mentioned account is provided for the ultimate redemption of corporate stock. Serial bonds, as already advised, do not require a sinking fund as they are redeemed pro rata directly through the budget.

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One of these sinking funds, that is, the "Sinking Fund for the Redemption of the City Debt," receives revenues directly from various sources and indirectly from the "Sinking Fund for the Payment of Interest on the City Debt" in a total sum far in excess of its actual requirements. As a medium to pass this surplus revenue to the General Fund for the Reduction of Taxation, the City of New York sells annually General Fund Bonds, under the provisions of Section 222 of the Charter, to the "Sinking Fund for the Redemption of the City Debt." All these bonds mature in 1930, when the Sinking Fund becomes extinct by the payment of its last public obligation, at which time these General Fund Bonds will be cancelled. In February of each year the Comptroller advises the Commissioners of the Sinking Fund as to the probable surplus in this sinking fund, and they authorize him to buy these bonds at 3%, and during the year these bonds are actually issued and held by the Sinking Fund in various amounts, depending upon the receipt of these revenues but not exceeding the total amount authorized to be bought. Interest is paid on these bonds. Later the Comptroller takes the amount of these General Fund Bonds into consideration when he certifies to the Board of Aldermen his estimate of the general fund for the year. While these bonds become a debt of the corporation, still they are an asset of the sinking funds. As the sinking funds are deducted from the total debt, it will be seen that one hand washes the other — while the gross debt increases, the assets increase in like amount.

APPENDIX D

ESTIMATED NUMBER OF OFFICIALS AND EMPLOYEES OF THE  
GOVERNMENT OF NEW YORK CITY DURING THE  
YEAR 1929\*

<i>Department, Court or Office</i>	<i>Number of Employees</i>	<i>Department, Court or Office</i>	<i>Number of Employees</i>
Accounts, Commissioner of.....	109	Finance, Department of.....	1,037
Aldermen, Board of, and City Clerk.....	169	Fire Department.....	7,441
Ambulance Service, Board of.....	5	General Sessions, Court of.....	235
American Museum of Natural History....	265	Grant's Tomb.....	3
Aquarium.....	28	Health, Department of.....	3,667
Armory Board.....	11	Higher Education, Board of.....	5
Art Commission.....	11	Hunter College <sup>4</sup> .....	1,292
Assessors, Board of.....	41	Hunter College Teacher's Retirement System.....	1
Banking Commission.....	....	Jurors, Commissioner of	
Bellevue and Allied Hospitals.....	2,797	Bronx County.....	11
Bronx, President of the Borough of.....	1,605	Kings County.....	25
Bronx County Law Library.....	1	New York County.....	40
Brooklyn, President of the Borough of... 2,638		Queens County.....	7
Brooklyn Institute of Arts and Sciences		Richmond County.....	3
Botanic Garden.....	63	Law Department.....	498
Central Museum.....	117	Licenses, Department of.....	94
Children's Museum.....	23	Manhattan, President of Borough of... 3,197	
Brooklyn Public Library.....	415	Mayoralty, The.....	28
Chief Medical Examiner.....	51	Metropolitan Museum of Art.....	450
Child Welfare Board.....	156	Municipal Assembly.....	4
Children's Court.....	152	Municipal Civil Service Commission... 114	
City Chamberlain.....	34	Municipal Court.....	408
City Court.....	170	National Guard and Naval Militia... 423	
City Employees' Retirement System... 92		New York Botanical Garden.....	120
City Magistrates' Court.....	623	New York Public Library.....	758
City Marshals.....	70	New York Public Library Building.... 20	
City Record, Board of.....	39	New York Zoological Garden.....	137
College of the City of New York <sup>3</sup> ... 1,296		Parks, Department of —	
Correction, Department of.....	911	Bronx.....	614
County Clerk —		Brooklyn.....	799
Bronx County.....	45	Manhattan.....	1,033
Kings County.....	55	Park Board.....	8
New York County.....	111	Queens.....	288
Queens County.....	52	Richmond.....	136
Richmond County.....	42	Parole Commission.....	51
County Court —		Plant and Structures, Department of... 3,267	
Bronx County.....	34	Police Department.....	18,003
Kings County.....	127	Public Administrator —	
Queens County.....	18	Bronx County.....	1
Richmond County.....	16	Kings County.....	8
District Attorney —		New York County.....	18
Bronx County.....	43	Queens County.....	4
Kings County.....	74	Richmond County.....	1
New York County.....	226	Public Markets, Department of.....	265
Queens County.....	45	Public Welfare, Department of <sup>6</sup> ..... 6,091	
Richmond County.....	13	Purchase, Department of.....	106
Docks, Department of.....	548	Queens, President of Borough of... 4,923	
Education, Department of <sup>6</sup> .....	42,000	Queens Borough Public Library.....	153
Elections, Board of.....	102	Records, Commissioner of —	
Estimate and Appraisal, Clerk's Office... 5		Bronx County.....	17
Estimate and Apportionment, Board of.....	189	Kings County.....	42
Examining Board of City Surveyors.... 2		New York County.....	45
Examining Board of Plumbers.....	5	New York County, Surrogate's Court.. 31	

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### ESTIMATED NUMBER OF OFFICIALS AND EMPLOYEES OF THE GOVERNMENT OF NEW YORK CITY DURING THE YEAR 1929<sup>a</sup>—Continued

Department, Court or Office	Number of Employees	Department, Court or Office	Number of Employees
Register —		Supreme Court, 2nd Department, Appellate Division /	43
Bronx County .....	83	Supreme Court, 2nd Department, Appellate Term .....	7
Kings County .....	234	Supreme Court Library —	
New York County .....	142	Brooklyn, Borough of .....	4
Queens County .....	166	Queens County .....	2
Revision of Assessments, Board of .....	1,150	Richmond County .....	4
Richmond, President of Borough of .....	1,150	Surrogate's Courts —	
Sheriff —		Bronx County .....	28
Bronx County .....	101	Kings County .....	57
Kings County .....	63	New York County .....	96
New York County .....	124	Queens County .....	20
Queens County .....	33	Taxes and Assessments, Department of ..	378
Richmond County .....	40	Teachers' Retirement System .....	51
Sinking Fund, Commissioners of .....	..	Tenement House Department .....	497
Special Sessions, Court of .....	100	Transit Commission .....	274
Standards and Appeals, Board of .....	23	Transportation, Board of .....	2,819
Staten Island Institute of Arts and Sciences .....	7	United States Volunteer Life Saving Corps .....	3
Street Cleaning, Department of .....	9,665	Water Supply, Board of .....	350
Supreme Court, First Department .....	439	Water Supply, Gas and Electricity, Department of .....	2,885
Supreme Court, First Department —		Weights and Measures, Bureau of .....	34
Maintenance of Appellate Division Court House .....	22		
Supreme Court, Second Department —		Total .....	131,667
Kings County .....	129		
Queens County .....	21		
Richmond County .....	7		

Source: City of New York Official Directory, 1929.

<sup>a</sup> The figures do not include the large numbers employed for purely temporary or emergency periods, such as election inspectors, substitute teachers, temporary clerks for preparation of tax bills and for collection of taxes, monitors at civil service examinations, snow-removal employees and employees required for vacation relief or to help out during short rush periods in the various departments.

<sup>b</sup> Represents the number of positions rather than incumbents; employees in the evening sessions are, in a large number of instances, also on the college staff in the day time, resulting in some duplication.

<sup>c</sup> Estimated. Represents the number of positions rather than incumbents; employees in the evening schools are, in a large number of instances, also in the day schools.

<sup>d</sup> Represents the number of positions rather than incumbents; employees in the evening and summer sessions are in a large number of instances, also on the college staff in the day time.

<sup>e</sup> Census of paid employees, October, 1928.

<sup>f</sup> The Appellate Division, Second Department, embraces the Counties of Kings, Queens, Richmond, Nassau, Suffolk, Westchester, Putnam, Dutchess, Orange and Rockland. Employees and expenses are paid directly by the State. A part of the total sum required is assumed by the State, and the remainder apportioned against each county by the State Comptroller, and the City is assessed the sums so apportioned to Kings, Queens and Richmond.

## APPENDIX E

### BRIEF CHRONOLOGY OF THE CATSKILL MOUNTAIN WATER SUPPLY

Report of Special Committee to Manufacturers' Association: sources west of the Hudson River considered for Brooklyn.....	March 15, 1897
John R. Freeman's report submitted to Comptroller Bird S. Coler...	March 23, 1900
Burr-Hering-Freeman Commission's report rendered to Commissioner of Water Supply Robert Grier Monroe.....	Nov. 30, 1903
Constitutional amendment passed exempting water-supply bonds from debt limit.....	Nov. 8, 1904
Chapter 724 of the Laws of 1905, creating the Board of Water Supply and defining its duties and powers, signed by Governor Frank W. Higgins.....	June 3, 1905
Board of Water Supply Commissioners appointed by Mayor George B. McClellan.....	June 9, 1905
Chief Engineer J. Waldo Smith began his duties.....	Aug. 1, 1905
Report of Board of Water Supply to Board of Estimate and Apportionment, recommending development of the Catskill Mountain watersheds submitted.....	Oct. 9, 1905
Plan for this development adopted by Board of Estimate and Apportionment.....	Oct. 27, 1905
Plan filed with State authorities for approval.....	Nov. 3, 1905
Development of watersheds of the Esopus, Rondout, and Catskill creeks approved by State authorities.....	May 14, 1906
Experimental shaft, new west shaft, of the Hudson pressure tunnel, begun.....	Feb. 23, 1907
Contract 2, the first for aqueduct construction, embracing 11 miles between Cold Spring and Hunters Brook, awarded.....	March 27, 1907
First sod turned, with appropriate ceremonies, by Mayor McClellan, near Garrison.....	June 20, 1907
Contract 3, for the main dams of the Ashokan reservoir, awarded...	Aug. 26, 1907
Police Bureau established.....	Feb. 28, 1908
First concrete placed for the aqueduct structure, near Peekskill....	April 28, 1908
First masonry laid for the Olive Bridge dam of the Ashokan reservoir	Sept. 19, 1908
Contract 30, for the Hill View reservoir, awarded.....	Dec. 10, 1909
Contract 9, for the Kensico reservoir, awarded.....	Dec. 24, 1909
Contracts 63, 65, 66 and 67 for City Tunnel No. 1, awarded.....	{ May 26, 1911 June 5, 1911
Maximum contractors' forces, 17,243 men, at active field work.....	Aug. 23, 1911
Maximum contractors' earnings, \$2,214,000 for month.....	Nov., 1911
Headings of the Hudson pressure tunnel met, and "holing through" shot fired by Mayor William J. Gaynor.....	Jan. 30, 1912
Bureau of Claims established.....	July 9, 1912
Brooklyn water delivered to Queens Borough through 48-inch main laid by the Board of Water Supply.....	May 16, 1913
Contract 89, for the Silver Lake reservoir, awarded.....	Aug. 19, 1913

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Storage of water in the Ashokan reservoir begun . . . . .	Sept. 9, 1913
Last heading in City Tunnel No. 1, between shafts 8 and 9 "holed through" by Mayor John Purroy Mitchell . . . . .	Jan 12, 1914
Authority to develop the Schoharie watershed obtained from State authorities . . . . .	Oct. 21, 1914
Began filling the Kensico reservoir with Catskill water . . . . .	Nov. 22, 1915
Began filling the Hill View reservoir with Catskill water . . . . .	Nov. 30, 1915
Board of Water Supply approved amended plan for development of the Schoharie watershed . . . . .	Dec. 22, 1915
First delivery of Catskill water into the distribution pipes of New York City; Bronx Borough supplied with Catskill water for the first time * . . . . .	Dec. 27, 1915
Hill View reservoir filled to full flow line for the first time . . . . .	Dec. 29, 1915
Board of Estimate and Apportionment adopted amended plan to develop the Schoharie watershed . . . . .	Jan. 31, 1916
Amended Schoharie plan filed with the State authorities for approval	Feb. 29, 1916
Kensico reservoir filled to full flow line for the first time . . . . .	May 23, 1916
State Conservation Commission approved amended Schoharie plan . .	June 6, 1916
Manhattan Borough supplied with Catskill water for the first time . .	Nov. 29, 1916
Water from the Ashokan reservoir passed over the spillway for the first time . . . . .	Dec. 12, 1916
Brooklyn and Queens Boroughs supplied with Catskill water for the first time . . . . .	Jan. 22, 1917
Richmond Borough supplied with Catskill water for the first time; began filling the Silver Lake reservoir with Catskill water . . . . .	Jan. 27, 1917
Silver Lake reservoir filled to full flow line for the first time . . . . .	Feb. 20, 1917
Maintenance of the Esopus watershed and operation of completed reservoir and aqueduct structures transferred to Department of Water Supply, Gas and Electricity . . . . .	Aug. 1, 1917
Civic Celebration of the introduction of Catskill water into New York City . . . . .	{ Oct. 12, 13 and 14, 1917
Contract 200, for the Shandaken tunnel, the first contract for the Schoharie development, awarded . . . . .	Nov. 9, 1917
Contract 203, for the Gilboa dam, awarded . . . . .	June 20, 1919
Board of Estimate and Apportionment adopted resolution requesting the Board of Water Supply to undertake studies for an additional supply of water for New York City . . . . .	June 17, 1921
Contracts 209, 210 and 211, for additional siphon pipes at fourteen locations along the Catskill aqueduct, awarded . . . . .	Nov. 23, 1921
Board of Estimate and Apportionment approved plan of new conduits for the Boroughs of Brooklyn and Richmond . . . . .	Oct. 20, 1922
Contracts 196, 197, 198 and 199, for new conduits in the Boroughs of Brooklyn and Richmond, awarded . . . . .	{ Jan. 16, 1923 Mar. 26, 1923 Jan. 29, 1924
Last heading in the Shandaken tunnel, between Shafts 2 and 3, "holed through" . . . . .	Feb. 13, 1923
Schoharie Creek water delivered through the Shandaken tunnel for the first time . . . . .	Feb. 9, 1924
Board of Estimate and Apportionment approved plan of the Williamsburg conduit, in the Boroughs of Brooklyn and Queens . . . . .	May 2, 1924

\* Small quantities mixed with Bronx River water had been supplied to the Williamsburg district through the Bronx conduit during the last week of November, 1915.

Plan for City Tunnel No. 2 submitted to Board of Estimate and Apportionment for approval . . . . .	Dec. 30, 1924
Full capacity of the Catskill aqueduct made available for the first time by placing in operation the last pipe-line at the steel-pipe siphons . . . . .	Jan. 7, 1925
Contracts 218 and 219, for the Williamsburg conduit, awarded . . . . .	{ Feb. 3, 1925 Feb. 4, 1925
Water delivered to Richmond Borough through the new conduits in Brooklyn Borough and Narrows Siphon No. 2 for the first time . .	Feb. 16, 1925
Storage of water in the Schoharie reservoir begun . . . . .	July 24, 1926
Board of Estimate and Apportionment approved policy of Board of Water Supply with respect to sewage disposal in villages on the Schoharie watershed . . . . .	Dec. 9, 1926
Williamsburg conduit placed in service . . . . .	Jan. 22, 1927
Plan for City Tunnel No. 2 adopted by Board of Estimate and Apportionment . . . . .	Mar. 10, 1927
Plan for City Tunnel No. 2 filed with State authorities for approval . .	May 18, 1927
Plan for City Tunnel No. 2 approved by State authorities . . . . .	June 15, 1927
Maintenance and operation of the Shandaken tunnel transferred to Department of Water Supply, Gas and Electricity . . . . .	July 1, 1927
Plan for development of the Rondout creek and tributaries of the Delaware River submitted to Board of Estimate and Apportionment for approval . . . . .	July 27, 1927
Authority to develop water supply from the Catskill creek and its tributaries and Kaaterskill creek, with aqueduct from the Catskill creek to the Ashokan reservoir, rescinded by Water Power and Control Commission . . . . .	Sept. 26, 1927
Schoharie reservoir filled to full flow line for the first time . . . . .	Oct. 19, 1927
Maintenance and operation of the Schoharie reservoir transferred to Department of Water Supply, Gas and Electricity . . . . .	Jan. 1, 1928
Plan for development of the Rondout creek and tributaries of the Delaware River adopted and approved by Board of Estimate and Apportionment . . . . .	Jan. 12, 1928
Plan for development of the Rondout creek and tributaries of the Delaware River filed with Water Power and Control Commission for approval . . . . .	Jan. 19, 1928
Contracts 224, 225, 226 and 227, for City Tunnel No. 2, awarded . .	Oct. 5, 1928

Source: Board of Water Supply, *Annual Report*, 1928.

APPENDIX F

NOTES TO TABLE 17, CHAPTER III, P. 58

<i>Class</i>	<i>Departments Covered and Purpose of Expenditures</i>
1. BUILDINGS.....	<p><i>From Tax Receipts:</i></p> <p>Executive: Armories and a few institutions administered by the Division of Standards.</p> <p>Correction and Penal: Prisons, reformatories, penitentiaries, etc.</p> <p>Education: Normal schools and a few schools of agriculture, etc.</p> <p>Health: Division of Laboratories and Institute for Study of Malignant Diseases.</p> <p>Mental Hygiene, Curative and Charitable: Hospitals for the insane, institutions for mental defectives, etc.</p> <p>Defensive: Armories and some camps.</p> <p>Public Works: Administration, Division of Public Buildings, maintenance and repairs.</p> <p>Special Funds: "Other Funds, — Construction."</p> <p><i>From Bond Issues:</i></p> <p>State Institutions Building Fund: Hospitals, prisons, offices, etc.</p> <p>State Improvement Fund: Predominantly hospitals, prisons, offices, etc.</p>
2. HIGHWAYS AND BRIDGES.....	<p><i>From Tax Receipts:</i></p> <p>Public Works Department: Division of Highways; maintenance of highways — General and Special; miscellaneous repairs, highways, Indian Reservations; all fixed charges; outlays, Highway Division.</p> <p>Port of New York Authority: Bridge construction.</p> <p>Lake Champlain Bridge: Bridge construction.</p> <p>Westchester County Park Commission: Bronx Parkway.</p> <p>Special Funds: Federal Post Roads Revolving Fund.</p> <p><i>From Bond Issues:</i></p> <p>Highway Improvement Fund.</p>



<i>Class</i>	<i>Departments Covered and Purpose of Expenditures</i>
<b>3. CANALS AND WATERWAYS . . . . .</b>	<p><i>From Bond Issues:</i></p> <p>Maintenance and Repairs.  Public Works Department: Canal Division.  Special Funds: Black River Regulating District; Hudson River Regulating District; Canal Fund maintenance and repairs.  General Fund: Canal maintenance.  Canal Construction.  Special Funds: Barge canal construction.</p>
<b>4. PUBLIC WORKS DEPARTMENT . . .</b>	<p><i>Miscellaneous Outlays from General Fund:</i></p> <p>This is the item "Public Works Department — outlays from General Fund" (other than Public Works Department outlays — Highway Division). It covers a variety of construction expenditures, largely on bridges and waterways, which can not be distributed between other major classes.</p>
<b>5. PARKS AND RESERVATIONS . . . . .</b>	<p><i>From Tax Receipts.</i></p> <p>Conservation and Protective: Parks, reservations, memorials, etc.</p> <p><i>From Bond Issues:</i></p> <p>Special Funds: State Park System.</p>
<b>6. HOLLAND TUNNEL . . . . .</b>	<p><i>From Tax Receipts:</i></p> <p>New York Bridge and Tunnel Commission: General Fund.  Special Funds: New York-New Jersey Tunnel Fund.</p>
<b>7. GRADE CROSSING ELIMINATIONS.</b>	<p><i>From Tax Receipts:</i></p> <p>General Fund: Grade Crossing eliminations.</p> <p><i>From Bond Issues:</i></p> <p>Special Funds: Grade Crossing Elimination Fund.</p>

APPENDIX G

TABLE 1.—TOTAL FEDERAL EXPENDITURES FOR NEW CONSTRUCTION BY CONTROLLING ORGANIZATIONS, 1919-1929<sup>a</sup>

(In thousands)

Department, Bureau or Office	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
<i>Building and Ground Improvement</i>											
<i>Department of Commerce</i>											
Coast and Geodetic Survey.....		°	\$8	°	\$2	....	\$4	\$3	\$7	\$3	\$2
Bureau of Fisheries.....	\$64	\$113	99	\$10	6	....	29	6	18	21	48
Bureau of Lighthouses											
Engineering Construction Division.....	760	776	574	406	503	\$479	429	492	561	781	710
Bureau of Mines.....									100	3	180
Bureau of Standards.....	62	9	9	9	9	9	10	9	259	8	31
<i>Department of the Interior</i>											
Freedman's Hospital.....					60	....	....	50	....	10	220
Howard University.....	4			201	16	....	197	370	....	....	....
St. Elizabeth's Hospital.....	186	25	15	....	104	28	46	15	7	210	....
National Park Service.....	56	26	99	163	92	178	112	99	124	149	268
<i>Department of Justice</i>											
Superintendent of Prisons.....	727	351	221	198	179	356	349	1,223	1,425	341	177
<i>Department of Labor</i>											
Bureau of Immigration.....	41	....	48	78	38	5	....	5	....	....	....
<i>Navy Department<sup>b</sup></i>	84,416	82,288	41,183	31,557	18,686	16,774	16,777	8,372	7,768	7,658	9,383
<i>Department of the Treasury</i>											
Supervising Architect.....	8,860	6,431	7,883	10,053	9,167	5,185	3,952	3,343	2,619	6,551	10,921
<i>War Department</i>											
Quartermaster Corps.....	143,367	4,052	5,118	1,807	1,134	660	529	1,205	7,803	5,513	12,259
Veterans' Bureau.....							2,903	4,268	6,117	6,412	4,495
Architect of the Capitol.....	216	170	....	....	....	....	....	93	745	....	387
D. C. Engineering Department.....	120	458	173	2,400	2,025	1,046	1,024	1,526	2,360	1,551	4,639
Public Buildings and Public Parks.....	409	346	162	545	234	113	144	206	353	835	225
Panama Canal and Railroad.....	1,986	1,933	757	35	35	197	423	338	1,235	1,584	1,592
<b>Total.....</b>	<b>\$241,274</b>	<b>\$96,978</b>	<b>\$56,849</b>	<b>\$47,462</b>	<b>\$32,290</b>	<b>\$25,030</b>	<b>\$26,928</b>	<b>\$21,623</b>	<b>\$31,501</b>	<b>\$31,630</b>	<b>\$45,537</b>

<sup>a</sup> The figures are for fiscal years ending June 30th.  
<sup>b</sup> Including all types of construction at shore stations.  
<sup>c</sup> Less than \$500.

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APPENDIX G

TABLE 1. — TOTAL FEDERAL EXPENDITURES FOR NEW CONSTRUCTION BY CONTROLLING ORGANIZATIONS, 1919-1929— *Continued*  
(In thousands)

Department, Bureau or Office	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
<i>Roads</i>											
<i>Department of Agriculture</i>											
Bureau of Public Roads.....	\$3,753	\$23,539	\$60,943	\$93,075	\$79,448	\$100,787	\$102,053	\$89,194	\$90,002	\$89,869	\$91,505
<i>Department of the Interior</i>											
National Park Service.....	145	104	64	251	213	376	1,212	1,299	1,250	3,011	3,601
<i>War Department</i>											
Quartermaster Corps.....	16,052	392	93	....	42	145	48	....	•	374	283
D. C. Engineering Department.....	735	1,115	1,190	820	825	1,162	2,241	2,724	1,775	2,312	2,812
Public Buildings and Public Parks.....	....	....	....	25	10	15	6	384	1,456	2,264	2,375
Board of Road Commissioners for Alaska.....	95	68	227	148	238	382	496	640	517	296	434
Panama Canal and Railroads.....	951	124	19	10	38	13	18	20	58	118	203
Total.....	\$21,731	\$25,342	\$62,536	\$94,329	\$80,810	\$102,880	\$106,069	\$94,261	\$95,058	\$97,744	\$101,213
<i>Drainage, Irrigation, Power, Water, Dams, etc.</i>											
<i>Department of the Interior</i>											
National Park Service.....	\$31	\$8	\$112	\$74	\$79	\$119	\$135	\$110	\$57	\$47	\$150
Bureau of Reclamation.....	5,928	4,040	6,351	6,467	8,399	8,826	7,902	6,653	5,324	7,025	7,940
<i>War Department</i>											
Corps of Engineers.....	5,438	12,677	17,413	7,965	11,226	17,748	19,264	13,236	10,472	9,351	19,396
Quartermaster Corps.....	43,227	1,613	438	369	192	113	246	87	130	712	210
D. C. Engineering Department.....	612	443	680	695	825	1,061	1,428	1,779	1,614	1,896	1,909
Public Buildings and Public Parks.....	10	....	....	....	....	....	....	....	....	....	....
Panama Canal and Railroad.....	1,450	325	440	34	90	70	146	1,027	1,080	231	121
Total.....	\$56,696	\$19,106	\$25,434	\$15,604	\$20,811	\$27,937	\$29,121	\$22,892	\$18,677	\$19,262	\$29,726
<i>Floating Equipment</i>											
<i>Department of Commerce</i>											
Coast and Geodetic Survey.....	\$43	....	....	....	....	....	....	....	....	....	\$411
Bureau of Fisheries.....	....	....	....	....	....	....	....	....	\$40	\$60	46
Bureau of Lighthouses											
Marine Engineering Division.....	3,356	\$258	\$777	\$438	\$1,000	\$128	....	\$244	669	....	....
Navy Department.....	374,333	181,692	168,379	98,101	45,852	47,728	\$36,554	34,962	37,677	34,097	49,712
Panama Canal and Railroad.....	....	....	1,217	....	....	59	208	261	382	695	52
Total.....	\$377,732	\$181,950	\$170,373	\$98,539	\$46,852	\$47,915	\$36,762	\$35,467	\$38,768	\$34,852	\$50,221

\* The figures are for fiscal years ending June 30th.  
• Less than \$500.

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APPENDIX G

TABLE 1. — TOTAL FEDERAL EXPENDITURES FOR NEW CONSTRUCTION BY CONTROLLING ORGANIZATIONS, 1919-1929 \* — *Continued.*  
(In thousands)

Department, Bureau or Office	1919	1920	1921	1922	1923 *	1924	1925	1926	1927	1928	1929
<i>Waterways and Water Front Improvements</i>											
<i>Department of Labor</i>											
Bureau of Immigration.....	\$120	\$167	\$10	....	....	....	....	....	....	....	....
<i>War Department</i>											
Corps of Engineers.....	13,796 <sup>b</sup>	22,856	27,325	\$16,715	\$21,569	\$33,685	\$36,401	\$29,866	\$25,804	\$31,039	\$31,257
Quartermaster Corps.....	333	39	28	20	2	....	67	....	2	35	37
<i>Panama Canal and Railroad</i> .....	1,597	342	1,107	277	5	118	170	66	88	82	....
<b>Total</b> .....	<b>\$15,946</b>	<b>\$23,404</b>	<b>\$28,470</b>	<b>\$17,012</b>	<b>\$21,576</b>	<b>\$33,803</b>	<b>\$36,638</b>	<b>\$29,932</b>	<b>\$25,894</b>	<b>\$31,156</b>	<b>\$31,294</b>
<i>Miscellaneous</i>											
<i>Department of Commerce</i>											
Bureau of Aeronautics.....	....	....	....	....	....	....	....	....	\$300	\$1,800	\$1,740
Coast and Geodetic Survey.....	....	....	....	....	....	....	....	....	....	....	4
Bureau of Fisheries.....	....	....	....	....	....	....	....	....	....	....	....
<i>Department of Labor</i>											
Bureau of Immigration.....	....	....	\$12	....	....	....	....	....	....	....	....
<i>War Department</i>											
Corps of Engineers.....	\$2,640	\$2,836	3,443	\$3,504	\$1,662	\$2,357	\$2,611	\$2,160	2,661	5,587	6,101
Quartermaster Corps.....	528	....	....	....	....	....	....	....	....	....	....
<i>D. C. Engineering Department</i> .....	84	84	86	95	113	120	153	201	271	300	313
<b>Total</b> .....	<b>\$3,252</b>	<b>\$2,920</b>	<b>\$3,541</b>	<b>\$3,599</b>	<b>\$1,775</b>	<b>\$2,477</b>	<b>\$2,764</b>	<b>\$2,361</b>	<b>\$3,232</b>	<b>\$7,687</b>	<b>\$8,158</b>

\* The figures are for fiscal years ending June 30th

<sup>b</sup> Less than \$500.

APPENDIX G

TABLE 1. — TOTAL FEDERAL EXPENDITURES FOR NEW CONSTRUCTION BY CONTROLLING ORGANIZATIONS, 1919-1929\* — Continued  
(In thousands)

Department, Bureau or Office	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
<i>Total—All Types of Construction</i>											
<i>Department of Agriculture</i>											
Bureau of Public Roads.....	\$3,753	\$23,539	\$60,943	\$93,075	\$79,448	\$100,786	\$102,053	\$ 89,195	\$90,002	\$89,369	\$91,505
<i>Department of Commerce</i>											
Bureau of Aeronautics.....	....	....	....	....	....	....	....	....	300	1,800	1,740
Coast and Geodetic Survey.....	43	6	8	2	....	....	4	3	7	3	413
Bureau of Fisheries.....	64	113	99	10	6	....	29	6	58	81	98
Bureau of Lighthouses											
Engineering Construction Division.....	760	776	574	496	503	479	429	492	561	781	710
Marine Engineering Division.....	3,356	258	777	437	1,000	128	....	245	699	....	....
Bureau of Mines.....	....	....	....	....	....	....	....	....	100	3	180
Bureau of Standards.....	62	9	9	9	9	9	10	8	259	8	81
<i>Department of the Interior</i>											
Freedman's Hospital.....	....	....	....	....	60	....	....	50	....	10	220
Howard University.....	4	....	....	201	16	....	197	370	....	....	....
St. Elizabeth's Hospital.....	186	25	15	....	104	28	46	15	7	210	....
National Park Service.....	232	138	275	488	384	673	1,459	1,508	1,431	3,207	4,019
Bureau of Reclamation.....	5,928	4,039	6,351	6,467	8,399	8,526	7,902	6,653	5,324	7,025	79,40
<i>Department of Justice</i>											
Superintendent of Prisons.....	727	351	221	198	179	356	349	1,223	1,425	341	177
<i>Department of Labor</i>											
Bureau of Immigration.....	161	167	69	78	38	5	....	5	....	....	....
Navy Department.....	458,749	263,980	209,563	129,658	64,539	64,501	53,331	43,334	45,445	41,755	59,095
<i>Department of the Treasury</i>											
Supervising Architect.....	8,860	6,431	7,884	10,058	9,167	5,185	3,952	3,343	2,619	6,551	10,922
<i>War Department</i>											
Corps of Engineers.....	21,374	38,370	43,181	28,184	34,456	53,790	58,275	45,261	38,937	45,976	56,754
Quartermaster Corps.....	203,508	6,095	5,677	2,195	1,370	919	890	1,292	7,935	6,634	12,787
<i>Veterans' Bureau</i> .....	....	....	....	....	....	....	2,903	4,268	6,117	6,412	4,495
<i>Architect of the Capitol</i> .....	216	170	....	....	....	....	....	93	745	....	287
<i>D. C. Engineering Department</i> .....	1,551	2,100	2,129	4,010	3,758	3,389	4,946	6,231	6,020	6,061	9,673
<i>Public Buildings and Public Parks</i> .....	419	346	162	570	244	128	150	590	1,809	3,089	2,500
<i>Board of Road Commissioners for Alaska</i> .....	95	68	227	148	236	382	496	640	517	296	434
<i>Panama Canal and Railroad</i> .....	5,984	2,725	3,540	358	166	457	961	1,712	2,843	2,709	1,969
<b>Total.....</b>	<b>\$716,532</b>	<b>\$349,700</b>	<b>\$346,704</b>	<b>\$276,545</b>	<b>\$204,114</b>	<b>\$240,041</b>	<b>\$238,282</b>	<b>\$206,537</b>	<b>\$213,130</b>	<b>\$222,331</b>	<b>\$266,149</b>

\* The figures are for fiscal years ending June 30th.  
 † Less than \$500.

APPENDIX G

TABLE 2. — TOTAL FEDERAL CONSTRUCTION EXPENDITURES FOR REPAIRS AND MAINTENANCE BY CONTROLLING ORGANIZATION, 1919-1929 <sup>a</sup>

Contract or Special Force

(In thousands)

Department, Bureau or Office	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
<i>Department of Commerce</i>											
Bureau of Aeronautics.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coast and Geodetic Survey.....	<sup>b</sup> .....	<sup>b</sup> .....	<sup>b</sup> .....	<sup>b</sup> .....	<sup>b</sup> .....	<sup>b</sup> .....	\$1.....	\$1.....	\$2.....	\$3.....	\$1.....
Bureau of Fisheries.....	\$3.....	\$19.....	\$6.....	\$8.....	\$3.....	.....	.....	<sup>b</sup> \$1.....	1.....	5.....	83.....
<i>Bureau of Lighthouses</i>											
Engineering Construction Division.....	412.....	578.....	554.....	559.....	625.....	\$666.....	678.....	760.....	725.....	813.....	840.....
Marine Engineering Division.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bureau of Mines.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bureau of Standards.....	13.....	14.....	14.....	14.....	13.....	15.....	14.....	13.....	14.....	13.....	14.....
<i>Department of the Interior</i>											
Freedman's Hospital.....	3.....	4.....	4.....	9.....	12.....	7.....	4.....	9.....	6.....	6.....	3.....
Howard University.....	.....	6.....	8.....	7.....	8.....	7.....	7.....	8.....	9.....	11.....	12.....
St. Elizabeth's Hospital.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
National Park Service.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bureau of Reclamation.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Department of Labor</i>											
Bureau of Immigration.....	59.....	12.....	113.....	84.....	117.....	420.....	105.....	120.....	60.....	59.....	274.....
<i>Navy Department</i>											
<i>Department of the Treasury</i>											
Supervising Architect.....	939.....	900.....	917.....	856.....	813.....	773.....	713.....	859.....	939.....	1,025.....	1,037.....
<i>War Department</i>											
Corps of Engineers.....	12,850.....	15,194.....	17,527.....	16,901.....	17,580.....	20,578.....	22,889.....	22,986.....	26,555.....	25,170.....	24,778.....
Quartermaster Corps.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	831.....	658.....
U. S. Shipping Board.....	.....	.....	.....	.....	.....	480.....	199.....	356.....	178.....	99.....	45.....
Veterans Bureau.....	.....	.....	.....	.....	.....	.....	4,438.....	1,060.....	1,182.....	1,094.....	769.....
D. C. Engineering Department.....	442.....	450.....	550.....	503.....	496.....	567.....	582.....	768.....	780.....	1,111.....	1,006.....
Public Buildings and Public Parks.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Board of Road Commissioners for Alaska.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<b>Total.....</b>	<b>\$14,721</b>	<b>\$17,177</b>	<b>\$19,693</b>	<b>\$18,941</b>	<b>\$19,677</b>	<b>\$23,513</b>	<b>\$29,630</b>	<b>\$26,970</b>	<b>\$30,451</b>	<b>\$30,240</b>	<b>\$29,520</b>

<sup>a</sup> This includes all types of construction. The figures are for fiscal years ending June 30th.

<sup>b</sup> Less than \$500.

APPENDIX G

TABLE 2. — TOTAL FEDERAL CONSTRUCTION EXPENDITURES FOR REPAIRS AND MAINTENANCE BY CONTROLLING ORGANIZATION, 1919-1929<sup>a</sup>— *Continued*

		<i>Regular Force</i> (In thousands)										
<i>Department, Bureau or Office</i>		1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
<i>Department of Commerce</i>												
Bureau of Aeronautics.....		....	....	....	....	....	....	....	....	....	....	....
Coast and Geodetic Survey.....		....	....	....	....	....	....	....	....	....	....	....
Bureau of Fisheries.....		....	....	....	....	....	....	....	....	....	....	....
Bureau of Lighthouses												
Engineering Construction Division.....		....	....	....	....	....	....	....	....	....	....	....
Marine Engineering Division.....		....	....	....	....	....	....	....	....	....	....	....
Bureau of Mines.....		....	....	....	....	....	....	....	....	....	....	....
Bureau of Standards.....		\$5	\$4	\$4	\$4	\$5	\$3	\$4	\$5	\$4	\$5	\$4
<i>Department of the Interior</i>												
219	Freedman's Hospital.....	3	3	4	4	4	4	6	5	7	7	10
	Howard University.....	....	51	68	62	73	64	59	68	78	97	110
	St. Elizabeth's Hospital.....	55	60	80	100	100	100	108	108	120	125	285
	National Park Service.....	300	309	393	432	426	514	691	552	557	690	779
	Bureau of Reclamation.....	1,833	2,144	2,978	2,104	2,115	2,521	2,553	2,402	1,815	1,757	1,779
<i>Department of Labor</i>												
Bureau of Immigration.....		....	....	....	....	....	....	....	....	....	....	....
<i>Navy Department</i>												
<i>Department of the Treasury</i>												
Supervising Architect.....		....	....	....	....	....	....	....	....	....	....	....
<i>War Department</i>												
Corps of Engineers.....		....	....	....	....	....	....	....	....	....	....	....
Quartermaster Corps.....		....	....	....	....	....	....	....	....	....	5,068	5,647
U. S. Shipping Board.....		....	....	....	....	....	10	237	52	128	45	105
Veterans Bureau.....		....	....	....	....	....	....	890	947	1,155	1,221	1,444
D. C. Engineering Department.....		1,127	1,191	1,334	1,396	1,869	1,575	1,678	1,902	2,083	2,478	2,183
Public Buildings and Public Parks.....		....	....	....	....	....	....	....	....	....	....	....
Board of Road Commissioners for Alaska.....		....	....	....	....	....	....	....	....	....	....	....
<b>Total.....</b>		<b>\$3,323</b>	<b>\$3,762</b>	<b>\$4,861</b>	<b>\$4,102</b>	<b>\$4,092</b>	<b>\$4,791</b>	<b>\$6,124</b>	<b>\$6,039</b>	<b>\$5,947</b>	<b>\$11,493</b>	<b>\$12,346</b>

<sup>a</sup> This includes all types of construction. The figures are for fiscal years ending June 30th.

APPENDIX G

TABLE 2.—TOTAL FEDERAL CONSTRUCTION EXPENDITURES FOR REPAIRS AND MAINTENANCE BY CONTROLLING ORGANIZATION, 1919-1929 \*—Continued

Special or Regular Force (Not Specified)  
(In thousands)

Department, Bureau or Office	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
<i>Department of Commerce</i>											
Bureau of Aeronautics .....	....	....	....	....	....	....	....	....	\$200	\$200	\$200
Coast and Geodetic Survey .....	\$34	\$73	\$60	\$87	\$70	\$69	\$75	\$72	79	78	79
Bureau of Fisheries .....	....	....	....	....	....	....	....	....	....	....	....
Bureau of Lighthouse Engineering Construction Division.....	....	....	....	....	....	....	....	....	....	....	....
Marine Engineering Division.....	506	756	628	510	603	576	567	466	626	642	512
Bureau of Mines .....	11	11	11	11	11	11	11	11	11	11	11
Bureau of Standards .....	....	....	....	....	....	....	....	....	....	....	....
<i>Department of the Interior</i>											
Freedman's Hospital .....	....	....	....	....	....	....	....	....	....	....	....
Howard University .....	....	....	....	....	....	....	....	....	....	....	....
St. Elizabeth's Hospital .....	....	....	....	....	....	....	....	....	....	....	....
National Park Service .....	....	....	....	....	....	....	....	....	....	....	....
Bureau of Reclamation .....	....	....	....	....	....	....	....	....	....	....	....
<i>Department of Labor</i>											
Bureau of Immigration .....	....	....	....	....	....	....	....	....	....	....	....
Navy Department .....	51,203	48,482	47,042	23,673	17,261	16,870	19,746	20,976	22,279	20,394	24,073
<i>Department of the Treasury</i>											
Supervising Architect .....	....	....	....	....	....	....	....	....	....	....	....
<i>War Department</i>											
Corps of Engineers .....	....	....	....	....	....	....	....	....	....	....	....
Quartermaster Corps .....	....	....	....	....	....	....	....	....	....	....	....
U. S. Shipping Board .....	....	....	....	....	....	22,616	12,877	11,190	14,774	15,900	16,972
Veterans Bureau .....	....	....	....	....	....	....	....	....	....	....	....
<i>D. C. Engineering Department</i>											
Public Buildings and Public Parks .....	1,547	1,821	1,474	1,280	1,397	1,607	1,728	1,827	1,829	1,815	2,011
Board of Road Commissioners for Alaska .....	152	64	123	279	820	348	279	374	873	564	563
Total .....	\$53,553	\$51,207	\$49,338	\$25,820	\$19,662	\$42,097	\$35,083	\$34,916	\$40,171	\$39,604	\$44,421

\* This includes all types of construction The figures are for fiscal years ending June 30th.



APPENDIX G

TABLE 2.—TOTAL FEDERAL CONSTRUCTION EXPENDITURES FOR REPAIRS AND MAINTENANCE BY CONTROLLING ORGANIZATION, 1919-1929—Continued

Total (Special, Regular and Not Specified Forces)  
(In thousands)

Department, Bureau or Office	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
<i>Department of Commerce</i>											
Bureau of Aeronautics.....	....	....	....	....	....	....	....	....	\$200	\$200	\$200
Coast and Geodetic Survey.....	\$34	\$74	\$60	\$68	\$71	\$69	\$76	\$73	81	81	80
Bureau of Fisheries.....	3	20	6	8	3	....	....	....	1	5	83
<i>Bureau of Lighthouses</i>											
Engineering Construction Division.....	412	578	554	559	625	666	679	760	724	818	840
Marine Engineering Division.....	505	756	628	510	603	578	567	466	626	642	512
Bureau of Mines.....	11	11	11	11	11	11	11	11	11	11	11
Bureau of Standards.....	18	18	18	18	18	18	18	18	18	18	18
<i>Department of the Interior</i>											
Freedman's Hospital.....	6	7	8	13	15	11	10	14	14	13	12
Howard University.....	..	56	76	69	81	71	66	76	86	107	122
St. Elisabeth's Hospital.....	55	60	80	100	100	100	106	106	120	125	285
National Park Service.....	300	309	393	433	426	514	591	553	557	690	779
Bureau of Reclamation.....	1,833	2,143	2,978	2,104	2,115	2,522	2,552	2,402	1,815	1,757	1,779
<i>Department of Labor</i>											
Bureau of Immigration.....	59	12	118	84	117	420	105	120	60	59	274
Navy Department.....	51,303	48,482	47,042	23,673	17,261	16,870	19,746	20,976	22,279	20,394	24,073
<i>Department of the Treasury</i>											
Supervising Architect.....	939	900	917	856	813	772	713	889	939	1,025	1,037
<i>War Department</i>											
Corps of Engineers.....	12,850	15,194	17,527	16,901	17,590	20,578	22,889	22,986	26,555	25,170	24,778
Quartermaster Corps.....	....	....	....	....	....	....	....	....	....	5,900	6,306
U. S. Shipping Board.....	....	....	....	....	....	23,106	13,113	11,598	15,080	16,044	17,121
Veterans Bureau.....	....	....	....	....	....	....	5,328	2,007	2,337	2,315	2,214
D. C. Engineering Department.....	1,569	1,641	1,894	1,899	1,865	2,142	2,261	2,670	2,893	3,589	3,189
Public Buildings and Public Parks.....	1,547	1,821	1,474	1,279	1,397	1,607	1,728	1,826	1,829	1,815	2,011
Board of Road Commissioners for Alaska.....	152	64	123	279	320	348	279	374	373	564	563
<b>Total.....</b>	<b>\$71,597</b>	<b>\$72,146</b>	<b>\$73,892</b>	<b>\$48,864</b>	<b>\$43,431</b>	<b>\$70,401</b>	<b>\$70,838</b>	<b>\$67,925</b>	<b>\$76,568</b>	<b>\$81,337</b>	<b>\$86,287</b>

\* This includes all types of construction. The figures are for fiscal years ending June 30th.  
 † Less than \$500.

APPENDIX G

TABLE 3. — TOTAL FEDERAL EXPENDITURES FOR NEW CONSTRUCTION BY GEOGRAPHICAL DIVISIONS, 1919-1929<sup>a</sup>

(In thousands)

<i>Division</i>	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
New England.....	\$24,229	\$24,044	\$15,902	\$11,109	\$11,176	\$11,019	\$18,604	\$13,320	\$14,044	\$10,884	\$8,434
Middle Atlantic.....	79,725	52,821	38,867	28,291	17,318	22,944	28,477	21,352	27,038	27,784	27,959
East North Central.....	44,399	11,572	17,649	22,404	20,671	21,839	23,522	19,703	20,797	26,115	30,394
West North Central.....	6,801	4,382	13,003	18,940	14,742	22,371	20,941	22,154	25,409	21,668	22,806
South Atlantic.....	137,356	59,430	48,465	41,476	26,206	26,273	29,451	35,123	39,355	30,662	39,047
East South Central.....	27,436	11,961	17,258	13,583	16,183	27,573	26,093	18,569	15,542	16,163	16,437
West South Central.....	30,098	12,682	15,748	18,568	18,577	19,493	19,633	16,668	13,386	13,190	25,287
Mountain.....	6,336	7,496	16,137	17,424	18,366	21,878	21,204	17,095	17,685	21,568	22,547
Pacific.....	29,567	27,569	34,131	23,254	24,361	25,427	25,221	24,467	17,728	23,394	31,471
<b>Total United States.....</b>	<b>\$385,947</b>	<b>\$211,757</b>	<b>\$217,160</b>	<b>\$195,049</b>	<b>\$167,600</b>	<b>\$198,817</b>	<b>\$213,146</b>	<b>\$188,451</b>	<b>\$190,984</b>	<b>\$191,426</b>	<b>\$224,382</b>
Alaska.....	148	380	769	530	1,010	1,137	1,030	1,245	1,148	869	1,113
Hawaii.....	1,544	2,059	1,827	1,728	3,964	7,534	2,112	2,289	2,206	3,050	5,077
Porto Rico.....	24	297	352	271	264	201	175	143	261	248	21
Panama.....	6,268	2,744	3,786	587	187	515	1,416	1,761	2,941	3,034	2,274
Undistributed.....	322,601	132,463	123,010	78,382	81,089	81,837	20,403	12,648	15,590	23,704	33,282
<b>Grand Total.....</b>	<b>\$716,532</b>	<b>\$349,700</b>	<b>\$346,704</b>	<b>\$276,545</b>	<b>\$204,114</b>	<b>\$240,041</b>	<b>\$238,282</b>	<b>\$206,537</b>	<b>\$213,130</b>	<b>\$222,331</b>	<b>\$266,149</b>

<sup>a</sup> This includes all types of construction. The years are fiscal years ending June 30th.

APPENDIX H

TABLE 1.—PUBLIC CONSTRUCTION CONTRACTS AWARDED IN CHICAGO DISTRICT (THE CENTRAL WEST), 1919-1929\*

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Educational buildings . . . . .	\$41,718 *	\$48,958	\$79,239	\$82,265	\$61,512	\$75,471	\$90,529	\$116,209 <sup>b</sup>	\$95,626 <sup>b</sup>	\$106,944 <sup>b</sup>	\$100,991 <sup>b</sup>
Hospitals and institutions . . . . .	11,709	16,669	21,836	27,290	15,822	22,619	28,850	29,825	40,911	35,042	38,676
Military and naval buildings . . . . .	771	1,070	3,493	1,021	484	1,027	1,151	816	1,750	2,702	2,026
Public buildings . . . . .	2,982	7,321	10,833	17,061	6,839	3,900	8,870	14,679	24,838	13,258	18,061
Waterfront developments . . . . .	17,705	7,855	6,316	7,911	13,609	17,699	7,025	11,957	11,838	22,802	21,191
Bridges . . . . .	16,458	15,924	12,722	15,182	22,124	20,098	20,914	28,036	42,552	44,847	35,408
Incinerators . . . . .	43	20	38	130	509	377	270	326	1,464	412	272
Lighting systems . . . . .	1,773	44,020	2,311	4,160	4,358	3,498	11,033	8,489	8,786	9,735	9,452
Docks and piers . . . . .	444	1,286	3,137	651	290	1,113	4,057	"	"	"	"
Subways and tunnels . . . . .	1,050	3,820	130	3,094	235	1,325	580	"	"	"	"
Sewage systems . . . . .	22,362	17,762	24,805	22,457	24,441	16,634	58,448	35,436	52,746	55,425	45,911
Street paving and road construction . . . . .	82,647	95,494	97,672	141,372	125,444	105,840	133,589	147,572	170,973	207,532	188,921
Water supply systems . . . . .	5,817	16,638	14,890	12,363	16,494	20,931	17,174	32,966	32,901	15,725	22,249
Parks (public) . . . . .	825	455	155	604	78	119	101	1,286 <sup>d</sup>	2,951 <sup>d</sup>	944 <sup>d</sup>	376 <sup>d</sup>
Total public construction . . . . .	\$206,804	\$277,082	\$278,577	\$336,341	\$290,749	\$290,649	\$377,591	\$427,496	\$487,336	\$515,368	\$483,534
Total public construction (in- clusive of private schools and exclusive of subways, tunnels, docks and piers . . . . .	\$209,235	\$277,988	\$281,389	\$348,715	\$305,343	\$305,270	\$416,869	\$427,496	\$487,336	\$515,368	\$483,534

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Sources: F. W. Dodge Corporation, Statistical Division.

\* Covers Illinois, Indiana, Iowa, Wisconsin, South Michigan, Missouri, Kansas, Oklahoma, Nebraska.

<sup>b</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these four years. In 1919 they amounted to \$3,923,921; in 1920 to \$5,812,700; in 1921 to \$6,079,000; in 1922 to \$16,319,600; in 1923 to \$15,119,300; in 1924 to \$17,058,400; and in 1925 to \$43,914,800.

<sup>c</sup> Not reported in these four years.

<sup>d</sup> Estimated as one-half total parks.

APPENDIX H

TABLE 2. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN NEW YORK DISTRICT (NEW YORK STATE AND NORTHERN NEW JERSEY), 1919-1929

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Educational buildings.....	\$21,842	\$33,617	\$28,498	\$58,377	\$75,703	\$87,445	\$53,301	\$68,998 <sup>a</sup>	\$77,329 <sup>a</sup>	\$101,967 <sup>a</sup>	\$98,233 <sup>a</sup>
Hospitals and institutions.....	13,369	12,794	13,908	26,444	20,756	38,683	23,425	47,688	53,291	54,191	44,711
Military and naval buildings.....	7,939	3,170	330	308	408	74	2,406	750	1,878	4,735	2,982
Public buildings.....	1,756	10,576	3,393	5,987	3,953	13,412	11,025	12,179	12,575	19,086	30,968
Waterfront developments.....	9,336	3,472	6,324	4,551	4,944	3,952	3,794	4,911	9,248	5,265	9,920
Bridges.....	3,164	10,452	2,827	3,913	5,152	3,250	13,116	27,438	43,040	15,158	14,833
Incinerators.....	339	312	76	37	250	1,538	611	916	2,952	2,065	687
Lighting systems.....	257	12,722	1,457	3,708	5,758	6,137	12,800	12,507	4,672	2,819	4,276
Docks and piers.....	5,776	35,373	1,089	2,872	732	399	8,905	b	b	b	b
Subways and tunnels.....	266	666	68	23,654	6,590	2,581	64,405	70,000 <sup>b</sup>	80,000 <sup>b</sup>	85,000 <sup>b</sup>	95,000 <sup>b</sup>
Sewage systems.....	17,400	7,785	2,711	5,757	6,412	5,943	4,581	16,336	24,220	17,416	21,383
Street paving and road construction.	42,049	40,841	29,597	30,069	25,714	25,524	17,475	52,045	107,333	106,471	117,933
Water supply systems.....	1,744	10,370	1,146	8,013	2,390	11,434	969	4,438	8,591	57,034	8,587
Parks (public).....	83	221	70	70	683	197	200	202 <sup>d</sup>	650 <sup>d</sup>	476 <sup>d</sup>	1,150 <sup>d</sup>
Total public construction.....	\$125,320	\$182,371	\$91,494	\$173,740	\$159,445	\$200,569	\$216,813	\$318,408	\$425,779	\$471,683	\$450,643
Total public construction (in- clusive of private schools and exclusive of subways, tunnels, docks and piers).....	\$120,994	\$148,765	\$98,016	\$157,462	\$159,845	\$220,078	\$161,006	\$248,408	\$345,779	\$386,683	\$355,643

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these four years. In 1919 they amounted to \$1,715,800; in 1920 to \$2,433,000; in 1921 to \$7,679,000; in 1922 to \$10,248,500; in 1923 to \$7,721,700; in 1924 to \$22,489,100; and in 1925 to \$17,501,900.

<sup>b</sup> Not reported in these four years.

<sup>c</sup> Not reported in these four years. These figures represent mainly estimates of subway construction in New York City.

<sup>d</sup> Estimated as one-half total parks.

APPENDIX H

TABLE 3. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN PITTSBURGH DISTRICT, 1919-1929\*

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Educational buildings.....	\$16,110	\$29,808	\$44,027	\$41,361	\$41,650	\$29,535	\$54,436	\$43,963 <sup>b</sup>	\$51,672 <sup>b</sup>	\$45,098 <sup>b</sup>	\$42,899 <sup>b</sup>
Hospitals and institutions.....	3,339	9,029	10,927	5,507	9,142	16,083	15,587	13,119	17,869	24,640	23,412
Military and naval buildings.....	265	954	384	468	410	321	532	4,562	913	893	208
Public buildings.....	2,494	4,823	2,976	3,880	3,103	3,682	3,769	6,229	5,368	4,071	9,170
Waterfront developments.....	6,504	4,948	2,755	5,992	7,609	4,544	5,255	6,161	5,649	5,737	4,884
Bridges.....	7,825	9,915	15,027	7,849	9,720	3,969	22,014	20,672	31,397	27,552	21,088
Incinerators.....	86	16	165	205	1,349	234	195	490	577	299	431
Lighting systems.....	516	1,817	602	1,737	4,738	1,264	5,486	862	3,332	4,648	9,131
Docks and piers.....	1,870	80	22	693	1,022	820	1,843	"	"	"	"
Subways and tunnels.....	4,738	500	65	158	443	250	1,766	"	"	"	"
Sewage systems.....	9,172	3,308	10,741	12,297	12,275	15,259	17,430	20,213	28,397	16,021	16,838
Street paving and road construction	69,494	52,613	77,688	76,218	91,242	91,351	96,419	102,122	105,457	108,450	108,422
Water supply systems.....	6,676	9,813	7,644	5,675	11,027	9,822	13,614	9,435	5,411	6,932	6,811
Parks (public).....	8	10	31	2	214	43	28	146 <sup>d</sup>	940 <sup>d</sup>	202 <sup>d</sup>	163 <sup>d</sup>
Total public construction.....	\$129,092	\$132,632	\$173,054	\$165,042	\$193,944	\$182,177	\$238,374	\$227,974	\$256,982	\$244,543	\$241,457
Total public construction (in- clusive of private schools and exclusive of subways, tunnels, docks and piers).....	\$123,656	\$133,446	\$176,688	\$169,632	\$196,811	\$189,170	\$241,881	\$227,974	\$256,982	\$244,543	\$241,457

Sources: F. W. Dodge Corporation, Statistical Division.

\* Covers Western Pennsylvania, West Virginia, Ohio, Kentucky.

<sup>b</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these four years, in 1919 they amounted to \$1,173,300; in 1920 to \$1,394,000; in 1921 to \$3,720,000; in 1922 to \$5,441,000; in 1923 to \$4,332,000; in 1924 to \$8,063,000; and in 1925 to \$7,115,800.

<sup>c</sup> Not reported in these four years.

<sup>d</sup> Estimated as one-half total parks.

APPENDIX H

TABLE 4. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN ATLANTA DISTRICT  
(SOUTHEASTERN STATES), 1923-1929<sup>a</sup>

(In thousands)

Purpose	1923	1924	1925	1926	1927	1928	1929
Educational buildings . . . . .	\$39,064	\$44,206	\$34,742	\$45,934 <sup>b</sup>	\$45,024 <sup>b</sup>	\$39,323 <sup>b</sup>	\$26,789 <sup>b</sup>
Hospitals and institutions . . . . .	16,090	14,154	10,868	9,809	9,807	8,309	8,248
Military and naval buildings . . . . .	561	89	953	1,151	942	1,623	1,309
Public buildings . . . . .	4,116	7,214	11,436	10,515	9,279	6,629	8,269
Waterfront developments . . . . .	5,441	15,158	11,601	11,400	11,642	8,032	34,127
Bridges . . . . .	13,785	12,502	16,991	23,021	20,954	37,270	18,508
Incinerators . . . . .	272	379	504	419	749	702	286
Lighting systems . . . . .	1,197	2,990	6,741	3,165	2,964	1,373	7,601
Docks and piers . . . . .	4,617	3,120	2,748	.	.	.	.
Subways and tunnels . . . . .	85	80	83	.	.	.	.
Sewage systems . . . . .	3,331	4,657	9,816	9,217	11,580	5,953	5,870
Street paving and road construction . . . . .	58,104	73,283	114,284	121,654	105,588	91,690	68,534
Water supply systems . . . . .	6,467	9,864	8,910	10,987	7,553	6,455	3,743
Parks (public) . . . . .	130	249	656	154 <sup>d</sup>	107 <sup>d</sup>	323 <sup>d</sup>	167 <sup>d</sup>
Total public construction . . . . .	\$153,260	\$187,925	\$230,333	\$247,426	\$226,189	\$207,692	\$183,451
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers) . . .	\$157,501	\$190,810	\$236,473	\$247,426	\$226,189	\$207,692	\$183,451

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Covers North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas, Louisiana.

<sup>b</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these four years. In 1923 they amounted to \$8,943,400; in 1924 to \$6,085,300; and in 1925 to \$8,971,500.

<sup>c</sup> Not reported in these four years.

<sup>d</sup> Estimated as one-half total parks.

APPENDIX H

TABLE 5. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN PHILADELPHIA DISTRICT  
(MIDDLE ATLANTIC STATES), 1919-1929<sup>a</sup>

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Educational buildings	\$11,333	\$12,127	\$29,675	\$37,948	\$20,292	\$20,203	\$30,685	\$47,143 <sup>b</sup>	\$46,329 <sup>b</sup>	\$52,033 <sup>b</sup>	\$52,368 <sup>b</sup>
Hospitals and institutions	4,453	5,795	11,548	12,643	3,894	10,414	15,522	15,200	20,028	22,656	17,413
Military and naval buildings	5,769	5,853	882	1,034	735	205	822	673	2,419	2,817	1,398
Public buildings	1,919	1,193	3,388	3,157	1,239	2,945	4,040	5,830	5,316	5,851	31,313
Waterfront developments	6,587	2,597	1,536	3,667	2,772	4,874	1,695	3,152	3,100	4,959	4,811
Bridges	8,343	7,532	10,178	7,593	5,726	19,759	12,872	14,872	27,786	29,524	23,696
Incinerators	24	129	88	223	194	212	117	650	553	110	639
Lighting systems	167	1,260	1,789	987	773	1,759	826	918	3,739	3,085	1,253
Docks and piers	6,954	601	3,117	9,902	5,766	2,270	222	"	"	"	"
Subways and tunnels	112	100	160	215	1,221	28,016	11	"	"	"	"
Sewage systems	2,741	1,830	7,593	5,517	3,997	8,494	9,042	8,287	15,106	16,577	8,936
Street paving and road construction	35,545	28,154	55,531	55,709	21,183	28,227	33,132	40,340	47,365	55,469	47,141
Water supply systems	1,310	3,203	5,907	5,279	3,444	3,249	4,900	4,539	4,623	2,976	3,676
Parks (public)	258	90	159	453	96	116	237	123 <sup>c</sup>	58 <sup>c</sup>	61 <sup>c</sup>	91 <sup>c</sup>
Total public construction	\$85,515	\$70,464	\$131,551	\$144,305	\$71,332	\$130,743	\$114,123	\$141,727	\$176,932	\$190,118	\$192,535
Total public construction (inclusive of private schools and exclusive of subways, tunnels, docks and piers)	\$80,130	\$71,638	\$131,226	\$141,134	\$67,929	\$108,030	\$123,061	\$141,727	\$176,932	\$190,118	\$192,535

Source: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Covers Eastern Pennsylvania, Southern New Jersey, Maryland, Delaware, District of Columbia, Virginia.

<sup>b</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these four years. In 1919 they amounted to \$1,680,680; in 1920 to \$1,874,200; in 1921 to \$2,951,600; in 1922 to \$6,945,800; in 1923 to \$3,584,200; in 1924 to \$7,573,000; and in 1925 to \$9,170,700.

<sup>c</sup> Not reported in these four years.

<sup>d</sup> Not reported in these four years. (Expenditures from loan funds for construction, improvement and equipment of Philadelphia subways, as reported in Comptroller's reports, amounted in 1919 to \$2,610,093; in 1920 to \$1,747,645; in 1921 to \$2,591,890; in 1922 to \$5,120,112; in 1923 to \$207,541; in 1924 to \$3,316,456; in 1925 to \$30,567,107; in 1926 to \$24,185,365; and in 1927 to \$18,966,420.)

<sup>e</sup> Estimated as one-half total parks.

APPENDIX H

TABLE 6. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN BOSTON DISTRICT  
(NEW ENGLAND STATES), 1919-1929<sup>a</sup>

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Educational buildings.....	\$11,019	\$17,683	\$21,304	\$20,541	\$22,010	\$28,670	\$38,233	\$35,708 <sup>b</sup>	\$45,549 <sup>b</sup>	\$43,710 <sup>b</sup>	\$42,308 <sup>b</sup>
Hospitals and institutions.....	3,663	4,324	8,105	10,133	7,225	8,267	11,068	10,319	14,331	13,847	14,374
Military and naval buildings.....	1,522	1,801	715	374	873	439	208	630	820	1,451	1,061
Public buildings.....	2,233	1,866	2,598	1,807	2,622	3,573	5,758	4,094	5,936	7,684	6,745
Waterfront developments.....	1,849	1,543	614	2,342	1,644	640	927	1,030	1,478	1,778	1,437
Bridges.....	2,097	8,614	2,563	4,789	5,927	5,387	3,608	7,647	7,986	9,269	5,159
Incinerators.....	35	.....	7	17	30	111	220	100	425	202	59
Lighting systems.....	446	1,960	406	2,137	2,645	2,246	1,825	3,125	3,354	2,186	2,666
Docks and piers.....	631	248	135	518	2,020	526	283	.....	.....	.....	.....
Subways and tunnels.....	482	16	1,725	111	.....	200	15	.....	.....	.....	.....
Sewage systems.....	3,958	2,366	952	4,076	3,144	3,694	3,846	3,637	3,924	3,860	4,214
Street paving and road construction.	15,394	13,422	9,192	12,958	15,922	10,394	13,954	19,150	20,856	28,876	27,216
Water supply systems.....	2,276	5,815	2,537	1,643	1,245	2,153	3,406	6,759	5,596	12,498	2,913
Parks (public).....	35	807	18	871	253	130	124	58 <sup>d</sup>	122 <sup>d</sup>	151 <sup>d</sup>	332 <sup>d</sup>
Total public construction.....	\$45,680	\$60,465	\$50,871	\$62,317	\$65,560	\$66,430	\$83,475	\$92,255	\$110,377	\$125,512	\$108,484
Total public construction (in- clusive of private schools and exclusive of subways, tunnels, docks and piers).....	\$45,999	\$62,370	\$51,000	\$71,444	\$68,958	\$75,874	\$99,862	\$92,255	\$110,377	\$125,512	\$108,484

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SOURCE: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Covers Maine, New Hampshire, Rhode Island, Massachusetts, Vermont, Connecticut.

<sup>b</sup> Private schools, which were subtracted from the figures for educational buildings in earlier years, are included in these four years. In 1919 they amounted to \$1,432,467; in 1920 to \$2,169,500; in 1921 to \$1,989,200; in 1922 to \$9,756,100; in 1923 to \$5,417,900; in 1924 to \$10,170,000; and in 1925 to \$16,485,000.

<sup>c</sup> Not reported in these four years.

<sup>d</sup> Estimated as one-half total parks.



APPENDIX H

TABLE 7. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN TEXAS DISTRICT, 1925-1929  
(In thousands)

<i>Purpose</i>	<i>1925</i>	<i>1926</i>	<i>1927</i>	<i>1928</i>	<i>1929</i>
Educational buildings*	\$13,182	\$14,019	\$10,992	\$14,407	\$12,381
Hospitals and institutions	2,548	2,458	3,687	2,694	3,174
Military and naval buildings	175	105	620	648	300
Public buildings	2,241	4,091	3,895	3,758	3,615
Waterfront developments	4,157	1,110	949	3,259	12,329
Bridges	1,026	919	1,517	1,270	2,784
Incinerators	56	148	14	77	267
Lighting systems	138	156	6,155	486	956
Docks and piers	1,558	b	b	b	b
Subways and tunnels	....	b	b	b	b
Sewage systems	1,053	6,336	3,510	4,025	2,129
Street paving and road construction	3,263	10,551	22,728	25,632	31,058
Water supply systems	4,022	2,836	6,198	4,232	2,255
Parks (public)	....	23 <sup>a</sup>	547 <sup>a</sup>	11 <sup>a</sup>	560 <sup>a</sup>
<b>Total public construction</b>	<b>\$33,419</b>	<b>\$42,752</b>	<b>\$60,812</b>	<b>\$60,499</b>	<b>\$71,808</b>

Source: F. W. Dodge Corporation, Statistical Division.

- \* Includes private schools.
- <sup>b</sup> Not reported in these four years.
- <sup>a</sup> Estimated as one-half total parks.

APPENDIX H

TABLE 8. — PUBLIC CONSTRUCTION CONTRACTS AWARDED IN MINNEAPOLIS DISTRICT  
(THE NORTHWEST), 1919-1929<sup>a</sup>

(In thousands)

Purpose	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Educational buildings.....	\$6,880	\$14,848	\$14,696	\$12,342	\$13,032	\$9,113	\$6,779	\$9,107 <sup>b</sup>	\$7,275 <sup>b</sup>	\$6,159 <sup>b</sup>	\$6,039 <sup>b</sup>
Hospitals and institutions.....	2,659	1,941	3,771	1,612	5,128	1,975	3,181	4,683	2,540	3,347	2,195
Military and naval buildings.....	125	149	569	389	58	46	93	31	133	303	58
Public buildings.....	1,038	868	3,374	559	1,912	588	1,041	986	2,287	733	3,396
Waterfront developments.....	982	3,327	2,739	1,293	4,398	387	358	348	144	5,746	1,740
Bridges.....	1,664	4,204	1,529	1,127	3,094	4,892	2,535	1,413	1,341	3,016	3,475
Incinerators.....	12	.....	97	.....	.....	58	16	.....	.....	.....	8
Lighting systems.....	246	115	213	156	455	210	474	468	347	646	347
Docks and piers.....	115	5	250	4,000	1,171	2,114	100	.....	.....	.....	.....
Subways and tunnels.....	35	3	4	.....	.....	.....	.....	.....	.....	.....	.....
Sewage systems.....	2,080	3,896	1,969	804	1,089	1,053	1,069	1,732	1,094	1,241	2,676
Street paving and road construction.....	7,390	8,751	14,359	7,850	14,620	11,876	8,275	13,870	13,883	12,073	21,246
Water supply systems.....	794	1,235	1,891	526	2,194	622	825	1,539	485	618	870
Parks (public).....	6	1	.....	.....	.....	.....	10	.....	2 <sup>d</sup>	.....	7 <sup>d</sup>
Total public construction.....	\$24,026	\$39,343	\$45,461	\$30,658	\$47,151	\$32,934	\$24,756	\$34,177	\$29,531	\$33,882	\$42,057
Total public construction (in- clusive of private schools and exclusive of subways, tunnels, docks and piers).....	\$24,562	\$40,909	\$46,059	\$27,394	\$46,885	\$32,166	\$25,995	\$34,177	\$29,531	\$33,882	\$42,057

SOURCE: F. W. Dodge Corporation, Statistical Division.

<sup>a</sup> Covers Minnesota, North Dakota, South Dakota, North Michigan.

<sup>b</sup> Private schools which were subtracted from the figures for educational buildings in earlier years, are included in these four years. In 1919 they amounted to \$686,435; in 1920 to \$1,574,000; in 1921 to \$852,000; in 1922 to \$735,900; in 1923 to \$905,000; in 1924 to \$1,346,500; and in 1925 to \$1,339,000.

<sup>c</sup> Not reported in these four years.

<sup>d</sup> Estimated as one-half total parks.

APPENDIX I

TABLE 1. — MUNICIPAL BOND YIELDS, 1900-1929

STANDARD STATISTICS INDEX YIELDS OF 15 MUNICIPAL BONDS AND BASIS AT WHICH NEW YORK CITY LONG TERM BONDS WERE ISSUED

Year	January Per Cent	February Per Cent	March Per Cent	April Per Cent	May Per Cent	June Per Cent	July Per Cent	August Per Cent	September Per Cent	October Per Cent	November Per Cent	December Per Cent
1900												
Standard Statistics Index Yields of 15 Municipal Bonds.....	3.12	3.13	3.12	3.11	3.11	3.11	3.13	3.13	3.13	3.13	3.12	3.08
Basis at which New York City Long Term Bonds were issued.....	3.09	...	3.03	...	...	3.03	...	...	...	3.07	3.02	3.98
	3.09										3.02	
											3.96	
											3.01	
1901												
Standard Statistics Index Yields of 15 Municipal Bonds.....	3.09	3.08	3.09	3.09	3.10	3.10	3.15	3.17	3.19	3.19	3.17	3.17
Basis at which New York City Long Term Bonds were issued.....	2.94	...	3.08	...	3.29	3.22	...	...	3.37	3.18	...	3.29
1902												
Standard Statistics Index Yields of 15 Municipal Bonds.....	3.17	3.18	3.19	3.15	3.15	3.19	3.21	3.20	3.21	3.21	3.25	3.26
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	3.24	3.27	...	...	...	...	3.20	...
					3.23	3.30					3.25	
					3.24	3.29						
1903												
Standard Statistics Index Yields of 15 Municipal Bonds.....	3.26	3.26	3.29	3.30	3.31	3.36	3.40	3.47	3.49	3.49	3.49	3.48
Basis at which New York City Long Term Bonds were issued.....	3.31	...	3.32	3.36	3.32	...	3.42	...	...	...	3.46	...
1904												
Standard Statistics Index Yields of 15 Municipal Bonds.....	3.48	3.49	3.52	3.51	3.49	3.48	3.42	3.40	3.40	3.39	3.39	3.38
Basis at which New York City Long Term Bonds were issued.....	3.49	...	3.50	...	3.48	...	...	...	...	...	3.40	...
					3.46							
1905												
Standard Statistics Index Yields of 15 Municipal Bonds.....	3.38	3.38	3.37	3.37	3.38	3.41	3.41	3.41	3.40	3.41	3.43	3.44
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	3.49	...	...	...	...	...	3.50	...
					3.47							

APPENDIX I

TABLE 1. — MUNICIPAL BOND YIELDS, 1900-1929—Continued

Year	January Per Cent	February Per Cent	March Per Cent	April Per Cent	May Per Cent	June Per Cent	July Per Cent	August Per Cent	September Per Cent	October Per Cent	November Per Cent	December Per Cent
1906												
Standard Statistics Index Yields of												
15 Municipal Bonds.....	3.44	3.45	3.48	3.47	3.51	3.54	3.57	3.64	3.70	3.69	3.67	3.67
Basis at which New York City Long												
Term Bonds were issued.....	...	3.65	...	...	...	...	...	...	...	...	3.91	3.94
												3.98
												3.99
1907												
Standard Statistics Index Yields of												
15 Municipal Bonds.....	3.68	3.70	3.73	3.72	3.76	3.80	3.80	3.86	3.93	4.00	4.11	4.17
Basis at which New York City Long												
Term Bonds were issued.....	...	3.98	...	...	...	...	3.99	4.00	4.46	...	...	...
		4.00					4.00	4.00	4.39			
		3.98										
1908												
Standard Statistics Index Yields of												
15 Municipal Bonds.....	4.17	4.00	3.97	3.98	3.95	3.90	3.93	3.91	3.89	3.86	3.82	3.79
Basis at which New York City Long												
Term Bonds were issued.....	...	4.29	...	...	...	...	...	...	...	...	3.89	...
		4.38									3.82	
1909												
Standard Statistics Index Yields of												
15 Municipal Bonds.....	3.75	3.73	3.72	3.74	3.75	3.77	3.78	3.80	3.79	3.82	3.83	3.85
Basis at which New York City Long												
Term Bonds were issued.....	...	...	...	...	3.93	3.96	...	...	...	...	...	3.98
						3.98						
1910												
Standard Statistics Index Yields of												
15 Municipal Bonds.....	3.87	3.88	3.91	3.93	3.97	3.99	4.04	4.03	4.02	4.00	3.97	4.01
Basis at which New York City Long												
Term Bonds were issued.....	...	...	4.16	...	...	...	...	...	...	...	...	...
1911												
Standard Statistics Index Yields of												
15 Municipal Bonds.....	3.99	3.99	3.98	3.97	3.96	3.96	3.97	3.97	4.00	4.00	4.01	4.00
Basis at which New York City Long												
Term Bonds were issued.....	4.21	...	...	...	...	...	...	...	...	...	...	...
1912												
Standard Statistics Index Yields of												
15 Municipal Bonds.....	4.00	3.99	4.00	4.01	4.01	4.02	4.01	4.01	4.03	4.04	4.08	4.09
Basis at which New York City Long												
Term Bonds were issued.....	...	...	...	...	4.21	...	...	...	...	...	...	...

APPENDIX I

TABLE 1. — MUNICIPAL BOND YIELDS, 1900-1929—Continued

Year	January Per Cent	February Per Cent	March Per Cent	April Per Cent	May Per Cent	June Per Cent	July Per Cent	August Per Cent	September Per Cent	October Per Cent	November Per Cent	December Per Cent
1913												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.09	4.08	4.12	4.16	4.20	4.25	4.35	4.32	4.36	4.30	4.21	4.23
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	4.49	...	...	...	...	...	...	...
1914												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.17	4.17	4.11	4.10	4.10	4.09	4.10	*	*	*	*	*
Basis at which New York City Long Term Bonds were issued.....	...	...	...	4.18	...	...	...	...	...	...	...	...
1915												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.15	4.14	4.13	4.14	4.23	4.21	4.23	4.23	4.19	4.18	4.08	4.03
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	...	4.44	...	...	...	...	...	...
						4.30						
1916												
Standard Statistics Index Yields of 15 Municipal Bonds.....	3.99	3.98	3.95	3.96	3.97	3.97	3.97	3.96	3.95	3.90	3.85	3.84
Basis at which New York City Long Term Bonds were issued.....	...	...	...	4.13	...	...	...	...	...	...	...	...
				4.03								
1917												
Standard Statistics Index Yields of 15 Municipal Bonds.....	3.82	3.90	3.94	4.08	4.15	4.26	4.29	4.32	4.38	4.35	4.44	4.51
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	...	...	4.46	...	...	...	...	...
							4.39					
1918												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.52	4.48	4.54	4.59	4.58	4.52	4.47	4.51	4.53	4.53	4.37	4.36
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	...	...	...	...	...	...	...	...
1919												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.43	4.46	4.53	4.52	4.47	4.44	4.44	4.45	4.44	4.45	4.45	4.47
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	...	...	...	...	...	...	...	...

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\* Stock Exchange closed.

APPENDIX I

TABLE 1. — MUNICIPAL BOND YIELDS, 1900-1929—Continued

Year	January Per Cent	February Per Cent	March Per Cent	April Per Cent	May Per Cent	June Per Cent	July Per Cent	August Per Cent	September Per Cent	October Per Cent	November Per Cent	December Per Cent
1920												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.53	4.62	4.62	4.83	5.03	5.23	5.25	5.28	5.22	5.06	5.02	5.10
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	...	...	...	...	...	...	...	...
1921												
Standard Statistics Index Yields of 15 Municipal Bonds.....	5.05	5.12	5.11	5.12	5.12	5.27	5.34	5.25	5.14	5.07	4.98	4.52
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	...	...	...	...	...	...	...	4.33
1922												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.43	4.43	4.37	4.20	4.17	4.18	4.21	4.18	4.11	4.14	4.20	4.15
Basis at which New York City Long Term Bonds were issued.....	...	...	...	4.12	...	...	...	...	...	...	...	...
1923												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.13	4.12	4.15	4.18	4.20	4.21	4.31	4.33	4.36	4.34	4.32	4.35
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	...	...	...	...	...	...	...	...
1924												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.31	4.31	4.31	4.30	4.23	4.19	4.16	4.15	4.08	4.10	4.09	4.12
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	...	4.19 3.99	...	...	...	...	...	...
1925												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.10	4.08	4.07	4.05	4.02	4.01	4.06	4.03	4.12	4.15	4.22	4.13
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	4.04	...	...	...	...	...	...	...
1926												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.10	4.09	4.09	4.07	4.06	4.06	4.06	4.04	4.08	4.09	4.09	4.07
Basis at which New York City Long Term Bonds were issued.....	...	4.18	...	...	...	...	...	...	...	...	...	...

APPENDIX I

TABLE 1. — MUNICIPAL BOND YIELDS, 1900-1929—Continued

Year	January Per Cent	February Per Cent	March Per Cent	April Per Cent	May Per Cent	June Per Cent	July Per Cent	August Per Cent	September Per Cent	October Per Cent	November Per Cent	December Per Cent
1927												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.04	4.04	4.00	3.96	3.94	4.00	4.02	4.00	3.96	3.93	3.93	3.90
Basis at which New York City Long Term Bonds were issued.....	4.12	...	...	...	3.94	...	...	...	...	...	...	...
1928												
Standard Statistics Index Yields of 15 Municipal Bonds.....	3.89	3.89	3.89	3.93	4.02	4.09	4.13	4.16	4.17	4.17	4.15	4.15
Basis at which New York City Long Term Bonds were issued.....	...	3.86	...	...	...	...	...	...	...	...	4.20	...
1929												
Standard Statistics Index Yields of 15 Municipal Bonds.....	4.16	4.25	4.32	4.29	4.23	4.26	4.28	4.31	4.32	4.29	4.25	...
Basis at which New York City Long Term Bonds were issued.....	...	...	...	...	4.81	...	...	...	...	...	...	...

Source: *Standard Statistics Bulletin*, base book 1929-1930, page 59, and card files of the Bond Buyer.

APPENDIX I

TABLE 2. — AMOUNT OF LONG AND SHORT TERM BONDS ISSUED BY CITIES IN THE UNITED STATES, 1905-1929\*  
(In millions)

Bonds		January	February	March	April	May	June	July	August	September	October	November	December
1905													
	Long Term Bonds.....	...	...	...	...	...	...	\$16.5	\$17.2	\$18.5	\$19.1	\$16.5	\$16.6
	Short Term Bonds.....	...	...	...	...	...	...	16.8	16.1	16.0	15.5	16.3	13.9
1906													
	Long Term Bonds.....	\$18.0	\$22.1	\$22.7	\$23.3	\$23.5	\$22.9	25.1	24.4	25.4	24.0	25.1	25.0
	Short Term Bonds.....	14.8	15.9	15.0	14.9	14.5	11.1	10.4	13.7	13.6	13.2	14.4	14.2
1907													
	Long Term Bonds.....	23.9	20.6	20.6	23.1	23.2	25.0	25.1	25.2	26.9	27.5	28.1	28.8
	Short Term Bonds.....	13.1	12.8	14.4	12.9	12.6	14.0	14.0	10.6	13.2	13.2	11.3	14.4
1908													
	Long Term Bonds.....	29.7	30.2	29.2	28.2	28.5	27.7	29.6	31.5	28.1	29.3	29.4	29.9
	Short Term Bonds.....	15.0	14.6	13.1	13.6	14.9	15.1	14.6	14.4	13.5	13.2	13.4	11.8
1909													
	Long Term Bonds.....	32.4	32.0	33.1	31.2	31.3	30.7	29.0	27.3	26.9	29.8	29.1	27.7
	Short Term Bonds.....	11.4	11.5	11.5	11.2	10.2	9.9	9.9	9.7	8.0	8.2	8.9	9.2
1910													
	Long Term Bonds.....	24.0	26.1	26.0	25.7	26.4	26.2	27.0	33.1	33.4	30.2	30.7	32.4
	Short Term Bonds.....	9.5	13.6	13.9	14.1	14.9	16.6	16.4	18.3	19.8	20.4	21.3	19.6
1911													
	Long Term Bonds.....	37.5	37.5	37.8	38.6	38.5	38.7	37.7	32.8	33.6	32.8	34.0	39.4
	Short Term Bonds.....	20.0	17.2	17.8	17.5	16.2	13.6	14.0	14.2	15.0	14.2	14.2	16.3
1912													
	Long Term Bonds.....	36.6	35.9	35.3	34.5	34.4	33.5	33.3	34.6	33.8	33.6	31.6	31.4
	Short Term Bonds.....	15.4	14.0	13.0	13.5	15.5	16.4	16.0	15.2	16.1	18.6	18.7	20.8
1913													
	Long Term Bonds.....	29.8	29.0	29.2	30.1	31.0	32.6	34.0	37.5	37.9	40.2	46.4	40.9
	Short Term Bonds.....	23.8	25.6	27.9	27.9	26.0	29.0	40.3	42.7	39.0	42.1	40.3	37.2
1914													
	Long Term Bonds.....	42.0	42.4	41.6	40.4	38.5	37.0	37.2	32.8	33.8	35.9	30.3	31.7
	Short Term Bonds.....	34.7	33.0	31.6	40.0	40.0	35.8	23.8	20.4	21.9	18.1	18.5	18.7
1915													
	Long Term Bonds.....	37.0	36.8	37.8	39.2	40.6	42.6	41.0	42.7	42.4	39.5	44.5	43.2
	Short Term Bonds.....	19.1	19.2	18.3	11.6	11.8	12.6	12.9	15.1	16.6	18.9	20.6	20.3
1916													
	Long Term Bonds.....	\$38.4	\$39.5	\$40.2	\$39.4	\$41.9	\$41.2	\$41.4	\$40.4	\$39.5	\$39.7	\$37.6	\$37.0
	Short Term Bonds.....	19.9	20.6	22.8	22.1	23.8	23.5	24.4	26.0	25.2	24.7	25.9	27.9

SOURCE: *Municipal Bond Sales Annual Edition*. The Bond Buyer, New York City



APPENDIX I

TABLE 2.—AMOUNT OF LONG AND SHORT TERM BONDS ISSUED BY CITIES IN THE UNITED STATES—Continued  
(In millions)

Bonds	January	February	March	April	May	June	July	August	September	October	November	December
1917												
Long Term Bonds.....	35.6	39.6	39.4	40.6	37.8	36.7	37.1	35.3	35.2	34.4	30.4	41.1
Short Term Bonds.....	30.2	29.5	31.2	31.2	31.5	31.8	32.7	30.9	32.5	32.6	31.5	32.0
1918												
Long Term Bonds.....	30.3	24.7	25.0	23.8	22.7	22.9	21.9	22.4	22.2	24.8	29.0	30.6
Short Term Bonds.....	32.3	36.4	34.2	35.9	35.1	39.1	39.4	40.4	41.6	42.6	44.6	41.4
1919												
Long Term Bonds.....	36.5	41.0	43.4	47.8	56.7	58.9	64.2	69.3	70.8	71.9	71.8	71.5
Short Term Bonds.....	41.6	38.1	38.2	38.6	38.5	36.1	37.5	42.5	40.6	46.3	47.2	48.2
1920												
Long Term Bonds.....	67.5	67.9	68.3	68.1	63.6	65.1	64.5	63.4	66.3	65.8	68.4	71.0
Short Term Bonds.....	47.6	46.8	47.8	48.6	53.5	55.1	55.3	51.9	51.8	50.3	55.3	59.5
1921												
Long Term Bonds.....	77.7	80.2	83.5	86.0	91.2	95.9	115.3	115.5	116.9	122.0	126.5	130.5
Short Term Bonds.....	60.8	63.6	64.2	65.7	64.2	64.1	63.5	59.5	60.1	56.8	46.8	42.2
1922												
Long Term Bonds.....	134.1	135.0	133.3	134.8	130.6	128.3	106.6	108.4	107.5	103.4	98.5	96.7
Short Term Bonds.....	40.0	38.5	36.7	34.2	34.2	32.9	33.0	35.9	34.9	32.4	37.0	37.9
1923												
Long Term Bonds.....	96.8	92.4	90.6	85.5	87.7	90.9	94.6	93.4	95.5	97.7	101.4	102.8
Short Term Bonds.....	40.0	42.8	44.6	44.3	39.7	44.3	42.9	43.0	45.1	49.0	50.6	55.2
1924												
Long Term Bonds.....	112.4	116.2	121.1	124.0	123.5	123.5	120.6	123.7	121.5	122.2	120.0	125.6
Short Term Bonds.....	56.1	57.5	60.1	67.5	77.6	80.8	81.5	81.8	81.5	82.2	83.7	80.2
1925												
Long Term Bonds.....	113.8	114.7	111.9	114.3	113.4	109.3	117.1	113.2	118.9	119.5	120.4	116.4
Short Term Bonds.....	84.0	80.3	78.1	73.7	70.9	63.4	72.2	74.4	71.6	74.2	72.2	71.9
1926												
Long Term Bonds.....	116.5	113.8	112.2	113.4	115.1	115.1	113.5	121.8	115.7	113.5	114.1	119.9
Short Term Bonds.....	68.6	70.1	69.5	67.7	63.4	61.1	55.1	51.0	59.1	54.6	54.1	52.7
1927												
Long Term Bonds.....	121.4	121.1	122.7	121.2	122.8	125.6	123.2	117.2	122.2	125.6	126.0	120.3
Short Term Bonds.....	50.0	47.3	49.2	50.7	53.0	54.2	52.1	55.6	54.9	55.6	56.5	55.2
1928												
Long Term Bonds.....	118.0	117.2	116.3	112.4	110.2	116.0	115.8	113.3	109.7	107.7	104.1	108.2
Short Term Bonds.....	57.7	60.9	61.1	61.2	62.2	61.2	59.7	63.2	59.7	58.0	60.3	64.1
1929												
Long Term Bonds.....	110.3	111.2	111.3	113.9	115.9	111.4	...	...	...	...	...	...
Short Term Bonds.....	64.4	64.5	66.4	68.3	69.7	70.2	...	...	...	...	...	...

\* The figures given are a twelve month moving average centered at the first of the seventh month.

APPENDIX I

TABLE 3A. — TAX RECEIPTS AND NEW ISSUES OF LONG TERM BONDS IN SELECTED CITIES, 1900-1929\*  
(In thousands)

YEAR	BALTIMORE, MD. <sup>b</sup>		BIRMINGHAM, ALA. <sup>c</sup>		BOSTON, MASS. <sup>f</sup>		CHICAGO, ILL. <sup>a</sup>		DETROIT, MICH. <sup>d</sup>		LOS ANGELES, CAL. <sup>e</sup>		MINNEAPOLIS, MINN. <sup>g</sup>	
	Tax Receipts	Bond Issues	Tax Receipts <sup>d</sup>	Bond Issues <sup>e</sup>	Tax Receipts	Bond Issues <sup>g</sup>	Tax Receipts	Bond Issues	Tax Receipts <sup>d</sup>	Bond Issues <sup>e</sup>	Tax Receipts <sup>m</sup>	Bond Issues <sup>n</sup>	Tax Receipts <sup>o</sup>	Bond Issues <sup>p</sup>
1900	\$5,581	\$5,982	\$152	\$549	\$24,672	\$3,164	\$12,243	\$500	\$3,802	\$332	....	....	•	....
1901	5,599	210	....	43	32,757	5,971	16,562	1,065	3,876	250	....	\$2,000	•	\$186
1902	6,277	1,190	186	88	25,236	9,368	14,299	....	3,808	336	\$1,583	....	\$2,386	470
1903	6,196	115	193	82	25,874	6,617	14,789	250	4,128	140	1,787	2,180	2,489	850
1904	6,711	340	203	239	26,614	7,190	15,960	8,250	4,248	181	897	538	2,884	695
1905	6,895	3,365	272	16	28,405	7,447	16,846	2,000	4,122	450	1,798	1,500	3,030	253
1906	6,890	1,152	252	86	29,649	5,922	17,434	1,400	4,090	672	....	288	3,135	220
1907	7,241	2,292	267	33	28,618	5,250	22,606	....	4,333	262	....	....	3,382	1,165
1908	7,546	5,233	....	173	30,822	4,499	22,667	4,850	4,986	599	3,328	1,034	3,791	1,847
1909	8,272	4,595	342	391	32,427	3,650	24,078	1,700	5,208	900	3,374	6,936	3,966	1,751
1910	8,529	5,063	441	500	33,219	4,616	25,130	4,375	6,320	365	4,162	5,236	4,924	565
1911	8,723	2,948	646	1,540	34,136	3,528	27,312	375	6,760	455	4,666	4,556	5,263	3,449
1912	8,555	6,700	361	316	34,788	4,775	24,734	2,855	7,211	273	5,023	11,754	5,719	2,080
1913	9,506	8,125	402	182	37,292	8,228	30,739	996	8,820	1,751	6,117	1,020	•	2,615
1914	9,557	8,550	852	341	37,356	7,146	31,872	5,232	10,081	5,148	6,669	1,593	•	2,633
1915	9,825	9,325	934	1,486	39,499	7,173	36,661	7,046	10,245	1,718	7,584	2,207	7,711	3,625
1916	11,056	1,775	921	36	40,345	5,766	38,653	5,673	13,062	2,385	6,818	4,185	6,184	2,531
1917	11,197	2,069	981	100	39,743	4,289	39,346	3,179	13,485	2,326	6,968	492	7,187	2,606
1918	12,116	664	1,010	398	46,650	2,220	35,030	4,676	16,186	1,661	8,069	348	7,453	235
1919	13,542	775	729	25	55,086	3,078	55,593	14,655	22,010	3,690	8,892	35	9,380	5,576
1920	18,363	1,088	748	1,997	57,922	2,845	59,698	12,099	25,501	2,702	8,905	1,186	•	7,456
1921	20,594	11,488	1,279	1,666	58,294	5,280	84,029	18,379	35,593	27,914	10,504	1,424	12,856	3,331
1922	22,037	11,811	1,421	788	60,026	8,095	83,120	8,906	37,820	30,037	11,521	17,602	15,940	5,836
1923	24,824	9,099	1,435	1,422	61,861	7,190	93,009	221	43,763	16,988	11,272	7,677	16,769	7,747
1924	29,302	11,496	1,472	150	62,397	6,795	96,903	4,554	48,405	18,380	17,085	26,542	18,562	4,378
1925	27,299	8,978	1,797	3,843	64,782	11,120	103,858	16,935	52,547	19,555	24,267	36,650	18,798	4,635
1926	28,080	18,822	....	3,167 <sup>o</sup>	78,474	10,817	105,884	7,148	56,256	24,038	24,528	18,550	19,671	9,507
1927	28,837	11,847	....	3,215 <sup>o</sup>	76,169	8,718	123,178	14,931	71,318 <sup>r</sup>	11,505	25,014	16,534	20,415	8,523
1928	....	14,860 <sup>o</sup>	....	2,567 <sup>o</sup>	77,793	10,204	....	55,005 <sup>o</sup>	76,031 <sup>r</sup>	27,512	29,564	7,443	20,874 <sup>m</sup>	4,831
1929	....	12,622 <sup>o</sup>	....	3,592 <sup>o</sup>	....	6,664 <sup>o</sup>	....	92,048 <sup>o</sup>	76,571 <sup>r</sup>	16,460	....	13,171 <sup>o</sup>	....	2,877 <sup>e</sup>

- \* Long term bonds are any bonds having a maturity of more than one year. Unless otherwise indicated, the date covers the annual year ending December 31st.
- † Figures taken from Baltimore, Comptroller's Annual Reports, and Commissioners of Finance, Annual Reports. Bonds issued are for city stock issued during the year.
- \* The years 1907 through 1910 are for the fiscal year ending June 30th; 1911 covers the period from July 1, 1910, to September 30, 1911; and the years 1919 through 1929 are for years ending September 30th.
- \* Figures taken from Birmingham, Auditor's Annual Report, 1900, 1908-1910; City Tax Collector's Annual Reports 1902-1907; Annual Financial Reports 1910-1925. They cover real and personal taxes, interest and discount, merchants' tax, excess bids tax sale, 1900-1907; real and personal property tax 1907-1925.
- \* Figures taken from Birmingham City Officers' Annual Reports 1900-1907; Auditor's Annual Reports 1908-1910; Annual Financial Reports 1910-1925. The figures cover the sum of public improvement bonds and general city bonds.
- † Figures taken from Boston, Treasury Department Annual Reports. They cover fiscal years ending January 31st, 1901-1925 (i.e. year 1900 is year ending January 31, 1901), and 11 months period ending December 31, 1925.
- \* Cover city loans for permanent improvements 1900-1928.
- † Figures taken from Chicago, Comptroller's Annual Reports.
- † Figures taken from Detroit, Comptroller's Annual Reports, 1900-1918, 1923-1927, and other figures from the present City Comptroller through the courtesy of the Detroit Bureau of Governmental Research, Inc. The figures cover years ending June 30th.
- † Figures are total receipts from general tax levies.
- \* Figures cover receipts from sale of bonds exclusive of bonds issued by the Water Commission or for street railways.
- † Figures taken from Los Angeles, Auditor's Annual Reports 1902-1922; Comptroller's Annual Reports of Financial Transactions of Municipalities, California, 1911-1928. Figures cover fiscal year ending November 30th, 1902 through 1908, and fiscal year ending June 30th, 1909-1928.
  - \* The figures cover collection of current and delinquent taxes except for the years 1902 through 1905 and 1908 when they cover only collection of current taxes.
  - \* The figures cover the amount of bond sales, principal plus premiums and accrued interest, except for the years 1901 through 1911 when they cover only the principal.
- \* Figures taken from U. S. Bureau of Census, Financial Statistics of Cities, and cover general property tax receipts.
- \* Figures taken from Minneapolis, Municipal Statistics, 1917; Budget Facts and Financial Statistics, 1924; and Report of Board of Estimate and Taxation, 1924-1928 (official), and cover total bond issues.
- \* Sum of bond issues as reported by Bond Buyer.
- \* Tax levy.
- \* No data published.
- † This figure is not comparable with the rest of the series, and is therefore omitted.
- \* Estimated from total revenue receipts, which were \$28,246,867. Property taxes represented 73.9 per cent of the total revenues for 1928.

APPENDIX I

TABLE 3B. — TAX RECEIPTS AND NEW ISSUES OF LONG TERM BONDS IN SELECTED CITIES, 1900-1929\*  
(In thousands)

YEAR	NEWARK, N. J.		NEW YORK, N. Y.		PHILADELPHIA, Pa.		PITTSBURGH, Pa. <sup>a</sup>		ROCHESTER, N. Y.		St. LOUIS, Mo.		SEATTLE, WASH.	
	Tax Receipts <sup>b</sup>	Bond Issues <sup>c</sup>	Tax Receipts <sup>d</sup>	Bond Issues <sup>e</sup>	Tax Receipts <sup>f</sup>	Bond Issues <sup>g</sup>	Tax Receipts <sup>h</sup>	Bond Issues <sup>i</sup>	Tax Receipts <sup>j</sup>	Bond Issues <sup>k</sup>	Tax Receipts	Bond Issues	Tax Receipts	Bond Issues
1900	\$3,193	\$2,107	\$72,295	\$33,745	\$18,252	\$5,800	\$4,569	\$7,000	....	....	\$4,759	....	\$ 374	....
1901	3,327	1,145	75,959	38,371	18,304	9,025	4,501	....	....	\$ 34	4,861	....	\$ 348	....
1902	3,697	1,497	78,622	29,602	18,052	6,415	....	....	\$2,679	116	4,874	....	460	\$ 100
1903	3,848	202	72,513	43,023	18,519	42	4,645	....	2,701	3,000	5,390	\$5,000	616	400
1904	3,916	900	77,611	86,826,	19,157	16,005	4,763	1,086	2,299	1,420	6,192	....	733	190
1905	4,278	3,530	86,322	41,211	19,371	....	5,107	2,000	2,475	410	6,406	1,000	853	423
1906	4,794	715	83,694	57,052	20,065	....	6,680	1,500	2,684	75	6,531	....	1,101	....
1907	4,981	1,166	86,679	79,100	20,586	6,200	9,818	1,066	2,794	75	6,434	....	1,648	2,350
1908	4,887	2,155	103,628	73,341	21,412	19,375	9,680	4,051	2,926	1,075	6,797	1,917	2,367	400
1909	5,928	1,590	117,369	72,566	21,988	8,740	11,483	4,178	3,132	175	7,139	5,509	2,547	1,000
1910	6,192	1,805	133,590	63,023	22,733	5,000	10,799	5,600	3,287	....	7,367	4,700	2,726	3,046
1911	7,722	2,545	135,024	86,086	23,917	13,450	10,732	1,528	3,421	....	7,550	....	3,633	2,186
1912	6,955	1,163	149,491	153,578	17,368	4,925	7,382	2,846	3,778	1,525	7,793	1,699	2,957	3,630
1913	7,818	1,550	148,557	252,681	17,584	6,375	7,079	4,600	3,968	6,174	7,869	....	3,189	1,275
1914	8,267	8,885	142,994	222,047	18,846	2,625	6,957	1,134	4,360	1,022	8,063	....	4,111	375
1915	9,590	2,220	157,899	118,041	18,992	5,000	7,704	4,650	4,575	2,000	9,011	2,750	3,835	1,279
1916	10,499	1,724	175,174	174,796	19,473	20,369	9,072	1,170	5,124	1,270	9,400	....	4,725	....
1917	11,206	2,365	171,315	192,490	24,843	20,050	8,335	264	6,356	1,875	9,665	....	4,417	575
1918	12,688	3,018	191,982	107,280	32,999	12,500	10,304	910	6,067	2,241	10,140	....	5,815	710
1919	16,572	1,133	201,792	148,674	34,726	8,000	10,979	5,644	7,057	1,715	9,488	....	6,138	245
1920	18,377	1,305	209,928	210,373	43,498	12,714	13,173	5,694	7,076	....	11,506	45	7,112	270
1921	19,236	6,625	262,000	343,803	47,967	24,576	14,136	5,826	8,239	4,225	11,864	1,500	6,957	....
1922	21,871	3,710	298,905	154,811	41,899	30,497	13,780	4,260	10,790	6,891	13,037	1,530	6,382	....
1923	22,120	5,700	288,969	198,668	42,749	12,000	15,131	1,213	10,989	4,805	13,848	763	6,208	110
1924	24,569	6,250	303,211	449,877	48,755	15,000	15,321	1,056	11,684	2,975	14,347	10,000	6,704	2,100
1925	25,274	4,900	319,189	461,396	50,773	32,410	14,772	1,916	13,719	4,800	14,528	4,500	7,613	1,230
1926	26,854	5,300	350,290	253,383	54,886	65,124	16,874	9,073	13,205	4,150	15,877	4,139	8,631	540
1927	30,872	13,100	383,592	300,363	57,471	25,000	17,519	13,974	14,699	4,616	16,428	11,500	8,549	1,520
1928	32,742	....	419,683	408,002	....	35,500 <sup>m</sup>	....	6,481 <sup>m</sup>	16,668	5,710 <sup>l</sup>	19,436	7,861	9,242	3,325
1929	....	9,250 <sup>m</sup>	....	....	....	34,329 <sup>m</sup>	....	2,800 <sup>m</sup>	....	4,720 <sup>m</sup>	....	10,000 <sup>m</sup>	....	7,191 <sup>m</sup>

\* The long term bonds are any bonds having a maturity of more than one year. Unless otherwise indicated, the years cover the fiscal year ending ~~1914~~ 1914, and the figures are taken from each city's Comptroller's Annual Reports.

† Figures taken from Newark, Auditor of Accounts Reports, 1900-1928, and include tax receipts from real and personal property taxes, franchise, trolley, jitney, gross receipts and poll taxes.

‡ Figures taken from Newark, Comptroller's Annual Reports 1900-1915; Auditor of Accounts Reports 1916-1928.

§ Covers tax receipts on real estate, special franchise, real estate of corporations, personal property.

¶ Total bonds issued for public improvements.

/ Total amount received by Receiver of Taxes.

‖ Long term loans issued.

‡ Figures cover fiscal years ending January 31, 1900-1913 (i.e. year 1900 is fiscal year ending January 31, 1901), and 11 months period ending December 31, 1914.

‡ Includes taxes of current year, delinquent taxes and special taxes.

‡ Covers proceeds from the sale of bonds.

‡ Covers revenue from taxes, including general city tax, interest and penalties on taxes, water frontage and bank taxes.

‡ Covers par value of bonds sold.

= Sum of bonds issued as reported by the Bond Buyer.

APPENDIX J

SUMMARY OF LAWS AS TO ALLOWABLE BOND ISSUES

STATE	TABULAR SUMMARY OF AVAILABLE LAWS AS TO ALLOWABLE BOND ISSUES, IN PER CENT OF TAXABLE BASES, AND ISSUANCE OF WATER WORKS BONDS IN EXCESS THEREOF <sup>a</sup>
ALABAMA	Towns under 6,000, 5 per cent. Three per cent additional for waterworks, sewerage, gas, electric lighting plants, and street improvements. Towns of 6,000 or more, also Gadsden, Ensley, Decatur and Albany, 7 per cent. Per cent unlimited for school-houses, waterworks, sewers, and street improvements, where cost of same, in whole or in part, is to be assessed against abutting properties. Cities of Sheffield and Tusculumbia excepted.
CALIFORNIA	Fifteen per cent for all purposes.
COLORADO	For incorporated municipalities, 3 per cent. Water works bonds, unlimited.
CONNECTICUT	Towns and municipalities, 5 per cent for all purposes. For water works, a special act of the General Assembly is required for bond issues in excess of 5 per cent.
DELAWARE	No general law limiting bonding. Each issue must be authorized by enabling act; 6 per cent of assessed valuation is assumed as maximum limit.
FLORIDA	Permissible indebtedness of each city or town is controlled by its charter and ordinances.
IDAHO	Water works bonds may be issued in excess of the legal limits for other bonded indebtedness.
ILLINOIS	Limit for all purposes 5 per cent of assessed valuation.
INDIANA	Municipalities, including water works, limited to 2 per cent of assessed valuation. For the purchase of water works, bonds may be issued against the utility. Such mortgage bonds bear no relation to 2 per cent limit.
IOWA	Towns of less than 10,000, 1½ per cent of actual value of taxable property. Cities of 10,000 or over, by a majority vote, may issue bonds for water works, including existing indebtedness, to the amount of 5 per cent of assessed valuation.

<sup>a</sup> This record is the best available, but needs to be further checked, especially with reference to effect of charters of cities of different classes.

- KANSAS**.....General bond limit, 15 per cent of assessed valuation. Towns of less than 15,000, additional 2 per cent for water works. Cities of over 15,000, limited only by vote of electors.
- KENTUCKY**.....Cities exceeding 15,000, 10 per cent of assessed valuation. Cities of less than 15,000, fourth class, 5 per cent; fifth and sixth classes, 3 per cent. In case of an emergency, water bonds may be issued in excess of above limits.
- LOUISIANA**.....General limit of 10 per cent of assessed valuation. Bonds for any municipal improvements, running for a period not exceeding 10 years, unlimited.
- MAINE**.....For all purposes, 5 per cent of assessed valuation.
- MARYLAND**.....No general limit. Each municipal bond issue requires authorization by the General Assembly. Bonds in amount of 2 per cent of taxable basis, in addition to any other indebtedness limitation, may be issued by counties or municipalities for water or sewerage construction, upon order of State Board of Health.
- MASSACHUSETTS**....For water works, not in excess of 10 per cent of assessed valuation.
- MICHIGAN**.....For water works, not in excess of 5 per cent of assessed valuation. Mortgage bonds against a utility may be issued beyond the 5 per cent limit. Detroit has a total debt limit of 15¼ per cent of assessed value. Two per cent is the limit for water works.
- MINNESOTA**.....In general 10 per cent of assessed valuation. Many special acts for public utilities exist. Water works bonds in excess of 10 per cent of assessed valuation require special authorization.
- MISSISSIPPI**.....Legal limit of bonded indebtedness of any municipality for all purposes, 15 per cent of assessed valuation.
- MISSOURI**.....General limit, 5 per cent of assessed valuation. For water works and certain other public utilities, towns under 30,000, not to exceed 10 per cent of assessed valuation. By affirmative vote of 4/7 of voters, cities of 75,000 and over may issue water works bonds to the extent of 20 per cent of taxable property.
- MONTANA**.....General limit, 3 per cent of taxable valuation. Water and sewerage bonds, apparently unlimited.
- NEW MEXICO**.....General limit, 1 1/3 per cent of actual value of taxable property. Water and sewerage bonds, 4 per cent of assessed valuation.
- NEW YORK**.....General limit, 10 per cent of assessed valuation. Water works bonds unrestricted.
- NORTH CAROLINA**...Total indebtedness limited to 8 per cent of assessed valuation. Water works and electric light improvements not counted in arriving at net indebtedness.

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- NORTH DAKOTA** . . . . . Five per cent of assessed valuation for all purposes, except that incorporated cities, by a three-fourth vote of resident property holders, may increase indebtedness to 8 per cent of assessed valuation.
- OHIO** . . . . . Two and one-half per cent total property value, without a referendum. Total net indebtedness that can be incurred with and without a vote of the electors is limited to 5 per cent of the assessed valuation. A favorable vote of two-thirds of those voting is required. Three per cent additional can be authorized by an order of the State Board of Health. When income from water works is sufficient to pay interest and retire bonds, water works bonds may exceed these requirements.
- OKLAHOMA** . . . . . Five per cent of assessed valuation for general purposes. When authorized by a majority vote, public utility bond issues are unlimited.
- OREGON** . . . . . Two per cent of assessed valuation without a referendum. A total of 10 per cent of assessed valuation with a referendum. Water works bonds included in 10 per cent.
- PENNSYLVANIA** . . . . . General, 2 per cent of assessed valuation without a referendum. Seven per cent of assessed valuation with a referendum. Philadelphia may issue bonds to 10 per cent of assessed valuation. All other municipalities 10 per cent, if assented to by three-fifths of the electors voting. Water works bonds in excess of general limit allowed by a few municipalities.
- SOUTH CAROLINA** . . . . . Water works and sewerage bond issues only are unlimited.
- SOUTH DAKOTA** . . . . . For general purposes, 5 per cent of assessed valuation. For water and sewerage, 10 per cent of assessed valuation.
- TENNESSEE** . . . . . There are legal limits placed upon bond issues for sewers, paving, etc. Water works bond issues are unlimited by law.
- TEXAS** . . . . . Towns under 5,000 are limited to 1½ per cent of assessed valuation for all purposes. Cities and towns of over 5,000 fix their own legal limit for various purposes, but cannot exceed a 2½ per cent of assessed valuation for all purposes.
- UTAH** . . . . . Cities of 5,000 or over, 8 per cent of assessed valuation for all purposes. Towns under 5,000, 12 per cent of assessed valuation for all purposes.
- VERMONT** . . . . . General provisions: Total indebtedness of a municipality cannot exceed ten times the amount of the last grand list of such municipality. This provision does not apply when the charter of a municipality limits its indebtedness.
- VIRGINIA** . . . . . General limit, 18 per cent of assessed valuation. Exception: By a majority vote the general limit may be exceeded for water works or other revenue producing projects.



## APPENDIX J

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- WASHINGTON**.....For general purposes,  $1\frac{1}{2}$  per cent of assessed valuation. With the consent of three-fifths of the voters, 5 per cent of assessed valuation. For water, light and sewers, with the consent of three-fifths of the voters, 10 per cent of assessed valuation. For the purification of water, or any improvement to a water system designed to protect the public health, no limit.
- West VIRGINIA**.....For water supply and sewerage, limited to 5 per cent of assessed valuation. Two and a half per cent of assessed valuation is maximum for water works bonds.
- WISCONSIN**.....General limit for all purposes, 5 per cent of assessed valuation. Mortgage certificates on the utility itself may be issued in excess of the general limit, for the purchase or construction of a new utility, but not for improvements to a system already owned by a municipality.

**SOURCE:** *Water Works Practice*: Manual of the American Water Works Association, Baltimore, 1925 pp. 549-552.

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