



Attorneys

Low

Confidential

Auction Price List



Important - SAVE THIS RATE CARD

MORTGAGEE FORECLOSURE

For 9 A. M.....\$20.00
For Other Hours.....\$25.00
If Sold Fixed Price

Appraisals - Flat Fixed Price

Other Sales, such as Assignee, Trustee,
Receiver's, Commissioner's, Bankruptcy, Etc.
If Sold As An Entirety 5% Commission

**Percentage Breakdown
If Sold In Trade Lots**

Gross Income	Commission
Up To \$2,000.....	10%
Over \$2,000.....	8%
Over \$3,000.....	7%
Over \$4,000.....	6%
Over \$5,000.....	5%
Over \$50,000.....	Fixed Rate

Member - R. I. Better Business Bureau

HAVE GAVEL
WILL TRAVEL

MAX POLLACK & CO.
PROFESSIONAL AUCTIONEERS

WE SELL ANYTHING ANYWHERE

434 INDUSTRIAL BANK BUILDING PROV. 3, R. I.



Save This Rate Card — Call DExter 1-6950

E C O N O M I C F O U N D A T I O N S T U D Y

Prepared in
The Department of Economics
Brown University

E C O N O M I C F O U N D A T I O N S T U D Y

Prepared in
The Department of Economics
Brown University

PREFACE

This report represents one section of the final report on economic studies made under the Providence Community Renewal Program. The Economic Foundation Study contains three major parts: (1) Some Economic Aspects of Community Renewal in Providence, Rhode Island; (2) Employment Projections for 1965, 1970 and 1975; and (3) The Revenue Capacity of the City of Providence.

Under the terms of the contract the foundation study was specifically not to be an economic base study. The social and economic characteristics of Rhode Island have been exhaustively studied in recent years and not much could be added by fresh studies.

The employment projections for the study were first made in the summer of 1961. With the passage of time a number of changes in definition and classifications have been made in the principal published employment series; consequently, the projections could not be directly compared with currently issued employment data. All projections have been recomputed to be in full conformity with the definitions employed in mid-1964.

The final task of the Economic Foundation Study program was the evaluation of the CRP program. This evaluation is presented in a separate report.

The Economic Foundation Study was under the general direction of Deane C. Carson. Part III: The Revenue Capacity of the City of Providence -- was prepared by Roger Van Tassel of Clark University.

TABLE OF CONTENTS

	<u>Page</u>
Part I: Some Economic Aspects of Community Renewal in Providence, Rhode Island	1
A. Basic Economic Considerations in Community Renewal	1
B. Providence: An Economic Profile	6
Part II: Employment Projections	24
A. Introduction	24
B. Methodology	25
C. The Data	26
D. Summary of Projected Employment, 1965, 1970, 1975	33
E. Projections of Manufacturing Employment	37
F. Employment in Retail Trade, Wholesale Trade and Services	56
G. Employment in Contract Construction, Transportation and Public Utilities, and Finance, Insurance and Real Estate	59
H. Employment in Government	67
Part III: The Revenue Capacity of the City of Providence	74
A. Revenue	74
B. Operating Expenses	85
C. Capital Expenditures	94

LIST OF TABLES

<u>Table No.</u>		<u>Page</u>
I	Population Characteristics of Providence	14
II	Age Distribution of Providence Population and Standard Metropolitan Area by Five-Year Intervals	16
III	Income Distribution by Families	19
IV	Occupational Wages 1961	21
V	Employment in Providence by Major Industry Class	22
VI	Employment in Rhode Island, by Major Industry Group, 1958, 1960 and 1962	29
VII	Employment in the Providence-Pawtucket Metropolitan Area, by Major Industry Group, 1958, 1960 and 1962	30
VIII	Employment in Providence, by Major Industry Group, 1958, 1960 and 1962	31
IX	Projected Employment in Rhode Island, by Major Industry Group, 1965, 1970 and 1975	34
X	Projected Employment in the Providence-Pawtucket Standard Metropolitan Area by Major Industry Group, 1965, 1970 and 1975	35
XI	Projected Employment in Providence, by Major Industry Groups, 1965, 1970 and 1975	36
XII	Percentage Distribution and Index Numbers, Manufacturing and Non-manufacturing Wage and Salary Employment, 1958 and 1962 (Actual), 1965, 1970 and 1975 (Projected)	38
XIII	Index Numbers, Non-manufacturing Wage and Salary Employment, by Major Industry Group, 1962, 1965, 1970 and 1975. (1958 = 100)	39
XIV	Employment Projections for Two-Digit Industries, Rhode Island, 1965, 1970, and 1975	47
XV	Employment Projections for Two-Digit Industries- Providence-Pawtucket Standard Metropolitan Area, 1965, 1970 and 1975	48
XVI	Employment Projections for Two-Digit Industries, Providence, 1965, 1970 and 1975	49
XVII	Percentage Distribution by Two-Digit Industry, Manufacturing Employment, 1958 and 1975, and Net Change, 1958-1975, Rhode Island	53

LIST OF TABLES (continued)

<u>Table No.</u>		<u>Page</u>
XVIII	Percentage Distribution by Two-Digit Industry, Manufacturing Employment, 1958 and 1975, and Net Change 1958-1975, PSMA	54
XIX	Percentage Distribution by Two-Digit Industry, Manufacturing Employment, 1958 and 1975, and Net Change 1958-1975, Providence	55
XX	Employment Projections, Retail Trade, Wholesale Trade, and Services, 1965, 1970 and 1975. Rhode Island	60
XXI	Employment Projections, Retail Trade, Wholesale Trade, and Services, 1965, 1970 and 1975. PSMA	61
XXII	Employment Projections, Retail Trade, Wholesale Trade, and Services, 1965, 1970 and 1975. Providence	62
XXIII	Projected Employment in Contract Construction, Rhode Island, PSMA and Providence, 1965, 1970 and 1975	64
XXIV	Projected Employment in Transportation and Public Utilities, Rhode Island, PSMA, and Providence, 1965, 1970 and 1975	65
XXV	Projected Employment in Finance, Insurance and Real Estate, Rhode Island, PSMA, and Providence, 1965, 1970 and 1975	66
XXVI	Projections of Government Employment per 1,000 Population for all Levels of Government, Rhode Island, 1965, 1970 and 1975	68
XXVII	Projections of Government Employment per 1,000 Population, PSMA, 1965, 1970 and 1975	69
XXVIII	Projections of Local Government Employment per 1,000 Population, Providence, 1965, 1970 and 1975	70
XXIX	Projections of Government Employment for all Levels of Government, Rhode Island, 1965, 1970 and 1975	71
XXX	Projections of Government Employment, PSMA, 1965, 1970 and 1975	72
XXXI	Projections of Government Employment for all Levels of Government, Providence, 1965, 1970 and 1975	73

LIST OF TABLES (continued)

<u>Table No.</u>		<u>Page</u>
XXXII	General Fund -- Receipts and Expenditures Exclusive WSB	75
XXXIII	Assessed Values and Tax Rates 1950-1962	77
XXIV	Building Permit Value Analysis - Providence	79
XXXV	Operating Expenditures, City of Providence 1950-1963	86
XXXVI	General Fund Expenditures 1961 and 1970	89
XXXVII	Length of Service of Teachers in the Providence School System, 1960	90
XXXVIII	School Population Estimate	92
XXXIX	Number of Teachers--Providence School System	92
XL	Estimates of Changes in Net Debt 1962-1970	96
XLI	Expenditure of Capital Funds	98
XLII	Debt Service Charges--1970	101
XLIII	Summary Table	103

E C O N O M I C F O U N D A T I O N S T U D Y

PART I: SOME ECONOMIC ASPECTS OF COMMUNITY RENEWAL IN PROVIDENCE,
RHODE ISLAND

A. Basic Economic Considerations in Community Renewal

Like many older cities in the United States, Providence, Rhode Island, is facing a series of economic and social problems that require analysis, the formulation of alternative solutions, and policy action. While many of these problems are common to metropolitan population centers and their central city core, those that face Providence are sufficiently unique to justify intensive study.

In spite of recent references to an affluent society, our economy is still an economy of scarcity. The resources with which we produce goods and services are limited relative to human wants: even if we used our resources to capacity, our total output would fall far short of our collective desire for material satisfactions.

Within the framework of relative scarcity, the economic system must provide a mechanism for determining which goods and services are to be produced -- and in what quantities -- how they are to be created, and who will receive the income generated by economic activity. In the American economy this mechanism is partly the system of relative market prices, and partly the decision-process of established governmental units. In other words, some economic activities -- the larger part in fact -- are directed by consumer and business decisions, while others are directed by government agencies, operating within the broad confines of public approval.

We are mainly concerned with the decision-process of local government units with regard to urban renewal planning. Yet we cannot ignore the prior problems relating to (1) the establishment of the level of total local government expenditures for a city such

as Providence and (2) the decision as to how much is to be spent on urban renewal as opposed to other competing goods and services. Only after these two questions have been resolved can we approach the direct problem of allocating urban renewal expenditures toward some predetermined goal or goals.

As economists, we have relatively little to say about the optimum level of government activities for Providence. The question of how large the government sector should be relative to the private sector is not primarily economic in nature, although it certainly may have economic implications. For example, the level of taxation, which is the largest but not the sole determinant of the size of the local government sector, will affect the decisions of firms to locate in Providence. The latter may also be affected by the form that taxation takes, the extent to which the city provides adequate services, and its long-run prospects for financial solvency.

We have made certain projections of the finances of the City of Providence under various assumptions. These estimates provide possible limits to the size of government activity in the future. Beyond this, we make no value judgments as to how far the city should go in expanding services, leaving these to the collective judgment of the citizens at the polls.

Within any given level of local government expenditures, decisions must be made with regard to the allocation of funds to alternative services. The need for such services in total is undoubtedly far greater than the city's projected ability to pay for them, although there is no universally valid criterion of need. But nearly everyone would agree that we could spend more on education, more on streets and highways, and more on police protection, not to speak of the lesser agreement that can be found on the desirability of improving and expanding a large number of other local government services.

The desirability of spending local funds on urban renewal must be weighed in terms of the alternative uses of such expenditures. If we spend more on urban renewal now, we may or may not have less to spend on competing activities, such as education, now and in the future. Whether or not we must cut down on these other activities depends to a considerable extent on the income and tax multipliers of urban renewal projects.

Unfortunately, there is a strong tendency to disregard the gains and losses to the community produced by urban renewal. Urban renewal activities can be justified only if they are a means to raise the standard of living of the community, i.e., the new uses of urban renewal properties will produce a greater value of service to the community.

The failure to judge urban renewal projects in terms of their ability to generate income has led to the use of criteria which have permitted an actual decline in the standard of living of parts or all of the community. One of the most widely used criterion is that of fiscal productivity whereby the worth of urban renewal activities is judged in terms of their net contribution to city revenues. While the tax-multiplier may be one consideration in the calculation of investment yields, it should not be given a weight such that the selection of a project is made to depend on the existing tax structure. In Providence, its emphasis appears to result from the overriding importance of the property tax in yielding local revenue; if the tax system were reformed to increase the relative importance of income and expenditure taxes, perhaps more emphasis would be placed on governmental expenditures that increase private income directly. We will later give examples of urban renewal expenditures that, while raising the property tax base and city revenues, contribute very little to the generation of private income.

As the matter now stands, the choice between urban renewal and alternative forms of local government investment appears to be made on the basis of political and social pressures and the Federal subsidies that are available for renewal activity. We are not implying that these pressures and subsidies necessarily lead to a misallocation of resources. We do suggest that far more attention should be given the very complex economic problems of analyzing and measuring the relative rates of return on alternative public investments at the local level. Until this is done, we shall not know whether a tax (or borrowed) dollar yields more to the community when spent on say, education, or on one of several kinds of community renewal activities.

The basic question is: Given the decision to spend x dollars on urban renewal activities, which kind(s) of expenditure are likely to yield the highest economic return? We define the goal largely in terms of maximizing the income stream, subject to recognition that the present tax structure requires us to consider the effect of renewal activity on the tax base. These goals are not necessarily incompatible; larger income streams and larger taxable wealth are usually consistent. But x (renewal) dollars spent on project y may yield a high marginal wealth-property base and low marginal income (railroad relocation) while x dollars spent on project z may yield a low marginal wealth-property base and high marginal income (industrial site space along a freeway).

Where this choice has to be made, we shall argue for the high income-generating project.

Finally, we must conclude, on the basis of the following study, that urban renewal expenditures of the volume that appears feasible for the City of Providence in the next decade will not offer a panacea for the city's economic ills. There are a number of reasons for this. First, the problem is much larger than the

city's resources to meet it. The prevalence of slum and deteriorating neighborhoods would require expenditures far in excess of the city's present and future revenue capacity. Nor can much be expected in the way of pump-priming to generate private investment in housing on the periphery of housing renewal projects that are undertaken. Second, the income-multiplier of urban renewal activities, while larger in some cases than others, is probably on the whole quite small. Since it is ultimately the need to raise low and middle incomes and for an expansion of private investment that lies at the heart of the economic problem of Providence, we should not expect a great stimulus to economic activity from renewal activity per se. Third, even the most optimistic projections indicate that Providence will be subject to pressures toward relative decline in the regional and national economy. It is particularly attractive to relatively small, low paying, and female labor-intensive industries, many of which might suffer inordinately from a further intensification of foreign competition. Fourth, substantial out-migration from the central city is forecast by many responsible observers; this would intensify the problems already felt of providing services for suburban workers in the city who do not share the tax burden and of external retail competition in outlying areas.

This is not to say that urban renewal activities should not be undertaken. From an economic standpoint some types of renewal and redevelopment activities may mean the difference between a slight gain and a continued decline in the economy. Socially, the city cannot ignore the problems created by slum and deteriorating neighborhoods, even though the direct economic returns may be low on such renewal investment.

With all of these factors in mind, it is realistic to think of urban renewal in Providence as a holding action against forces

that are intensifying its economic problems. Solution of the latter will require other, more powerful, changes in the economic base, which probably lie beyond the means of the local government to provide.

B. Providence: An Economic Profile

1. General Economic Problems of the City

Providence is a commercial, financial, and industrial center of a metropolitan area that includes much of the State of Rhode Island and a small part of Southern Massachusetts. This larger urban complex, like Providence itself, is based upon a foundation of manufacturing enterprises that support and require a wide variety of trade and service activities.

The economic structure of the city, like that of the state and metropolitan area, has changed markedly in the past several decades. Many of these changes have been painful: everyone is familiar with the decline of the textile industry, to cite but one example. Indicative also of the difficulties encountered in the transition from the old economy to the present is the continued high rate of unemployment in the city and the state.

Like many cities in the old industrial complex of the north-eastern seaboard, Providence's economy has been forced into transition by several factors. One of the more important of these has been the almost universal ownership of automobiles, which not only has facilitated the growth of suburban population at the expense of the central city, but also has enabled both new and old industries to move from in-city multi-story plants to suburban one-story layouts that are more economical and efficient.

With particular reference to the textile industry, both real and imagined cost-savings have induced an exodus of a large part of the major base of the economy to the South, where a cheap and

unmilitant labor force was available, as well as governmental subsidies of various kinds.

The geographical shift of population westward has also contributed to a reduction in the advantage of Rhode Island's location as far as product marketing is concerned. This factor may have contributed to the loss of some firms.¹

Some firms have terminated their manufacturing activity in Providence (and the state) because of anticipated gains from producing their commodities abroad, rather than exporting them from domestic plants. Foreign investment has replaced domestic investment and production in at least one major Providence firm in the past decade. Furthermore, imports from abroad have undoubtedly affected the growth rate of several Providence industries such as jewelry and textile specialties.

Yet another factor involved in the past economic travail of the city and state has been the lack of dynamic management leadership, until relatively recently, in some manufacturing enterprises. The 19th century left a legacy of family-owned, closely-held enterprise, which had developed substantial concentration of wealth, while failing to provide the aggressive young management teams that are vital to survival in a competitive, changing economic environment. Too often this has resulted in attempts to maintain the status quo, the old methods, and the old product lines. For many years gross investment in plant and equipment in a number of industries fell below depreciation allowances.

Providence has not shared in the overall rate of growth of the national economy because of peculiar natural disadvantages. It has

1. As Professor Stein has demonstrated in a recent study of this factor, however, not much weight should be given to it as an explanation of past changes in Rhode Island manufacturing activity. See Stein, J. L., "The Competitive Position of the Rhode Island Economy, Part IV: Motor Transport Costs and the Competitive Position of Rhode Island and New England Firms," Brown University, College-Community Research Program.

no great supplies of basic raw materials which would attract heavy industry and mining activity; although as a seaport it has access to raw materials that are shipped by sea, notably fuel oil. It has not become a center of foreign trade, primarily because New York and Boston (to a lesser degree) have superior access to major transportation networks to the west and south and also enjoy economies of scale. It further appears that there is no economic incentive to make Providence a major port.

As we shall subsequently point out in detail, the manufacturing sector of the Providence economy has shrunk, both relatively and absolutely (in terms of employment), between 1958 and 1962. This fact is all the more discouraging in view of the fact that very conservative predictive methods had indicated that a slight increase would occur. While the percentage of decline was small and the prediction error also modest, we cannot look upon the results with equanimity, for the period was one in which the national economy moved from recession to recovery. (An intermediate business cycle, of course, intervened.)

The manufacturing base of Providence is fairly diverse, in the sense that employment is spread among a dozen or more major industry categories. In spite of this, the general structure is such that (1) a substantial demand for female labor exists at relatively low-wage rates, (2) employment fluctuations are large both seasonally and cyclically, and (3) long-run losses of jobs in certain key industries have not been compensated by the growth of demand in other manufacturing sectors. All of these characteristics add up to a substantial rate of unemployment, higher than the national average, even when the national economy is prosperous.

Points (1) and (2) are not unrelated. Because of unemployment in the male labor force, together with the relatively low male wage scale, many women have entered the labor market to bolster

family income. And because of the existence of this reservoir of female labor, Providence is particularly attractive and suited to the needs of female labor-intensive industries, such as jewelry. This is a mixed blessing, however; many of these firms are weak, while many of the stronger have seasonal patterns that create unemployment and place heavy demands on the unemployment compensation fund. In addition, the presence of women in the labor force undoubtedly creates social and family problems to some extent, although we are not competent to speak on this subject.

Leaving manufacturing for the moment, it must be noted that the retail sector of the central city faces a serious economic problem at the present time. The so-called Downtown Master Plan is an attempt to stem the inevitable tide that appears to be eroding the central business district--something that has happened in all cities of Providence's size class. At this time it is not clear at all that even the most optimistic expectation of public and private investment in downtown Providence will be sufficient to prevent its relative and perhaps absolute decline as a shopping center in the metropolitan area.

Perhaps more symptomatic of the city's economic structure than a first cause is the widespread prevalence of deteriorating and blighted residential areas. Three factors explain much of this phenomenon. First, the general income distribution is such that many families are unable to afford better accommodations, or although able to afford them, come from cultural and environmental backgrounds in which housing expenditure is given relatively low priority. These two aspects of the income-consumption pattern are often self re-enforcing in the sense that low incomes perpetuate cultural environments that place relatively low priority on housing and neighborhood physical condition. At the same time, the cultural environment is not always conducive to those expenditures on human capital, such as education, which lead to higher income.

Secondly, a pattern of heavy absentee ownership in some areas leads to deteriorating neighborhoods. Landlords either cannot or, in some cases, will not maintain property values through adequate depreciation expenditures. As individual entrepreneurs, the return on marginal improvements is considered low since rents are determined by the general condition of the neighborhood in addition to the condition of the individual unit. Furthermore, since the average return on investment in housing is probably greater than the marginal return, investment tends to flow into the purchase of additional "three deckers" rather than into improvement of existing structures. Low rentals may also force the average rate of return to a critically low figure in neighborhoods where vacancy rates have been rising and supply is ample.

This is not conducive to improvement expenditures. Under such conditions landlords may earn their return by reducing maintenance to the minimum required by the housing code. It is not uncommon to find landlords who leave maintenance to the tenants in exchange for low rents. Again, this practice often means that nothing is done to maintain, let alone improve, the dwelling unit.

Thirdly, the widespread informal practice of housing segregation has prevented Negro citizens from upgrading their housing conditions. This is quite apart from the income and cultural impediments that have been noted above. Overcrowding in some neighborhoods has been perpetuated by the inability of Negroes to secure decent housing in the less crowded, higher income neighborhoods.

In any case, the blighted areas of residential Providence constitute a significant fraction of the total supply. Urban renewal expenditures on housing can, within the limits of the city's resources, make but a small dent in this situation. Improvements in the necessary volume must come largely from private investment.

Whether or not this will be forthcoming depends to some degree on the boldness and the form of urban renewal activity.

2. Is the Future as Bleak as the Past Would Indicate?

It is always dangerous to assume that history provides an adequate basis for forecasting the future. This is particularly true of economic history, which is made in a dynamic economic environment, and seldom offers good answers to the shape of economic variables in future periods. It would be unwise, therefore, to assume that Providence will continue to be handicapped by those economic forces that have made her recent economic history so trying. There are some new forces beginning to operate that should provide a potential framework within which the city can maintain a viable economic life. While this is perhaps a modest outlook to anyone accustomed to thinking in terms of a potential national growth rate of 5 per cent, it is at least a goal that is not beyond the possibility of achievement: a low unemployment ratio, a positive rate of growth in real per capita income, the attraction of some new diversified industry, the prevention of industry losses to other regions (particularly the loss of the stronger firms), are all parts of a viable economic structure. We should think in terms of the possible, and, at least until that has been achieved, put aside pipe-dreams that involve a booming, rapidly expanding city economy.

What are the forces that provide the modest optimism expressed above? Bear in mind that all, none, or some of these factors may actually affect Providence in the next fifteen years. Since each involves prediction, it would be hazardous to attempt anything like a measurement of their impact on a region as small as the central city. Nevertheless, as stated above, they may provide the potential ingredients for a somewhat better economic environment than has existed in the recent past.

First, we note the expanding population of the Eastern Seaboard, stretching from Boston to Baltimore. Even though some central cities within this population complex are declining, the total population has been increasing and should continue to do so in the future. The importance of this lies in the fact that those industries that need to be located near the consumer will find expansion necessary (as consumer incomes rise) within the Eastern Seaboard region. Assuming that transport costs are not as important as other production costs within the region, but become critically important relative to other costs in reaching large consumer markets outside the region, we could expect that Providence has the potential to attract some of these expanding consumer industries. But even this depends upon other changes that seem to be on the economic horizon.

The second factor involves the notion of the central city as a factor of production. As such it constitutes a combination of production factors in the more usual sense of the term: land, in the form of available production sites at reasonable cost; available labor with varying degrees and kinds of productive skill; financial institutions willing and able to provide capital. But beyond these the central city provides productive factors in the form of highways, schools (vocational and otherwise), parks, police and fire protection, etc. To a considerable degree, a favorable combination of such factors of production not only those privately provided but also those that are socially produced, is necessary to economic viability.

To some extent the above factors depend upon sound policies and capable city management. A significant part of the city's contribution to economic expansion can and should lie in the area of economic programs designed to raise the level of income within the city. Provision of industrial site space in advance of demand is a recognized need. Not only will this tend to induce private

construction of more efficient plants on a replacement basis but may also provide an attraction to outside firms. While the existing industrial site projects have been largely filled with replacement demand, there has been some net new demand. Further inducements to new industry should also be explored, particularly those which involve tax reform.

Another factor that may prove conducive to the economic vitality of Providence is the system of highways now being constructed. The interstate system will provide much easier and more efficient access to Providence than has been the case in the past. Over time this should result in a two-way movement of commerce and industry: those firms that require the external economies of a city location will be attracted more readily than had the system not been built. On the other hand, the rapid transport provided to other sections of the state and metropolitan area may cause a greater diversification of industry than now exists. To a considerable degree this would appear to depend upon the net advantage of land sites along the interstate system within Providence. This argues for an expansion of industrial and commercial site space within Providence; otherwise, the city will tend to lose some firms by default.

3. Population and Income Structure

As seen in Table I, the total population of the city declined by 41,176, or approximately 16 per cent, between 1950 and 1960. This was one of the largest percentage declines among the nation's cities during the period. It reflects a combination of forces, including an accelerated suburban migration and a lack of employment opportunities which has led to interregional out-migration.

Significantly, while the white population fell by 44,468, the non-white population increased by 3,292 or by more than one third over the period. This reflects a higher non-white birth rate,

relatively higher mobility on the part of whites, and a net addition to the non-white population from areas outside the central city.

TABLE I
POPULATION CHARACTERISTICS OF PROVIDENCE

	Year	
	1950	1960
1. Total Population	248,674	207,498
2. Total White Population	239,993	195,525
3. Total Non-White Population	8,681	11,973
4. Total Foreign Stock ¹	N.A.	91,217
5. Total Male Population	119,231	98,250
6. Total Female Population	129,443	109,248
7. Total Households	72,349	67,982
8. Total Families	63,475	52,903
9. Total Married Couples	54,380	43,729
10. Population per Household: Providence	3.26	2.94
SMSA	3.34	3.19
11. Population in Group Quarters	12,823	7,897

Note: 1 - First- and second-generation Americans

Source: U. S. Bureau of the Census, U. S. Census of Population: 1950, 1960; Vols. 39 (1952), 41 (1963).

The relatively high proportion of foreign stock in the 1960 population (probably within the white population group almost exclusively, since non-white migration to the U. S. has been very low in the past several generations) is also striking. In general, first- and second-generation Americans have fewer skills, less education and fewer employment opportunities than the longer-established citizens. In regard to the housing pattern and characteristics, a large recently arrived population perhaps explains the overcrowded conditions that one observes in the deteriorating neighborhoods of the city. Not only is there a tendency for a clustering of recent

immigrants in an ethnic pattern, but the low wage incomes which such people are able to generate tend to produce inadequate housing expenditures.

The figures on number of households obviously have some bearing on the demand for the housing stock. Had there been no net reduction in the number of housing units (including apartments and single rooms) the supply of housing in Providence would have been even more redundant than it is today, ignoring quality considerations. But during this period, partly as a result of urban renewal and highway activity, many older structures were in fact demolished. Since projected population figures for the city indicate continuing decline, future urban renewal programs will continue to have a smaller impact on the housing market than if population were to stabilize or increase.

The distribution of the population by age intervals in Table II offers some interesting comparisons. First, taking into account the percentage of the total population in the relatively unproductive age groups, that is, ages 0-19 and 65 and over, we find that this increased from 35.8 per cent in 1950 to 45.6 per cent in 1960. This increase was approximately equally divided between the younger and older groups.

The comparison of absolute numbers within the age intervals is somewhat more meaningful. The age interval from 0-19 declined by 3,144 between 1950 and 1960, which was almost matched by the 3,050 increase in the over 65 interval. Obviously, the greatest change came within the productive age group 20-64, which fell by 40,080. This is not surprising: the greatest number fell in this interval in both years, and the highest mobility is found in this group.

TABLE II
AGE DISTRIBUTION OF PROVIDENCE POPULATION AND STANDARD
METROPOLITAN AREA BY FIVE-YEAR INTERVALS

Age	1950			1960		
	Number	Percentage		Number	Percentage	
	<u>Prov.</u>	<u>Prov.</u>	<u>SMSA</u>	<u>Prov.</u>	<u>Prov.</u>	<u>SMSA</u>
0-4	22079	8.9	9.6	19569	9.4	10.5
5-9	17618	7.1	7.7	16477	8.0	9.5
10-14	14824	6.0	6.3	15764	7.6	8.7
15-19	16808	6.8	6.6	15375	7.4	6.9
20-24	21413	8.6	7.3	13901	6.7	5.5
25-29	21596	8.7	8.5	11592	5.6	5.4
30-34	19106	7.7	7.8	12633	6.1	6.7
35-39	18122	7.3	7.5	13404	6.4	7.4
40-44	16644	6.8	6.8	13041	6.3	6.8
45-49	15014	6.0	6.2	13245	6.4	6.4
50-54	14848	6.0	6.0	12669	6.1	5.8
55-59	14171	5.7	5.4	11655	5.6	5.1
60-64	12148	4.9	4.5	10840	5.2	4.6
65-69	10022	4.0	3.6	10318	5.0	4.0
70-74	6804	2.7	2.5	8000	3.9	3.1
75-79	6335	2.5	2.5	5009	2.4	2.0
80-84				2589	1.2	1.0
85 and over	1122	.5	.4	1417	.7	.6
Totals	248674	100.0	100.0	207498	100.0	100.0

Source: U. S. Bureau of the Census, U. S. Census of Population: 1950, 1960, Vol. 39 (1952) and Vol. 41 (1963).

Comparison of the 1950 and 1960 numbers indicates greatest percentage and absolute declines within the productive population in the intervals between 20 and 34. The greatest losses, therefore, occurred in the more vigorous segment of the population, although

in the age brackets 20-29 Providence compares favorably with the SMSA. Not all of these were lost to the local economy, of course, but one suspects that their removal from the city will present serious problems in the decades ahead. If indeed they were better trained and capable of higher income generation than the workers above 35, as we would expect, their loss may be an important factor in the economic future of the central city.

The pattern of income distribution in the city is given in Table III. Note should be taken that 48.9 per cent of the family units had less than \$5,000 income in 1960, a figure that constitutes a minimally adequate income for a family of five, and more than one third had less than \$4,000.

The large numbers of families in the under \$4,000 income bracket (35 per cent of the total) would seem to have much to do with the current state of the housing stock in deteriorating neighborhoods. If we take 20 per cent of gross income before taxes as the maximum proportion to be spent on housing, a family with \$4,000 per year would spend \$800 on this item, or \$66 a month. Such rents are not inconsistent with those found in declining neighborhoods. Furthermore, very few mortgage payments can be brought to this level on houses within the city that would meet decent standards. Basically, then, we must conclude that Providence's housing difficulties are due to the fact that a large fraction of the families cannot afford anything much better than what they now have.

Comparing the income distribution of Providence with that of eleven cities of approximately the same population located in different sections of the country (Table III) we find that only one, Jacksonville, Florida, has a greater percentage of families in the under \$5,000 a year income group. The following percentages are given for purposes of comparison: Jacksonville: 56.9;

Providence: 48.9; Austin, Texas: 48.5; Richmond, Va.: 48.3; Mobile, Ala.: 48.3; Charlotte, N. C.: 43.2; Worcester, Mass.: 37.8; Spokane, Wash.: 35.8; Salt Lake City, Utah: 34.9; Grand Rapids, Mich.: 34.8; Syracuse, N. Y.: 33.5; San Jose, Calif.: 25.5.

Interesting enough, Providence's lower income distribution percentage is closer to that of southern cities with heavy Negro populations than with the northern and western cities. Perhaps the most striking difference is found between Providence and Worcester, both old New England industrial cities with low non-white populations.

Much the same pattern emerges when we examine these cities for family income distribution above \$10,000 a year. Providence, which had 10.3 per cent of its families in this bracket in 1960, was second lowest of the 12 cities examined. Jacksonville had 9.1; Mobile, 11.8; Austin, 13.4; Worcester, 13.9; Richmond, 14.7; Grand Rapids, 15.1; Spokane, 15.2; Charlotte, 16.2; Salt Lake City, 17.5; Syracuse, 18.0; and San Jose, 19.7.

The basic pattern that emerges is one in which Providence has a larger-than-average low-income group, as well as a lower-than-average high-income group. Basically, the income distribution is heavily weighted toward middle and lower income classes in comparison with cities of similar population.

Turning now to the wage structure of Providence, we again compare it in broad occupational categories to six of the eleven cities mentioned above for which data were available in 1961. Table IV gives average wages in each category and ranks for each city in each occupation. A rank of 1 means that the city had the highest wage in that occupation; a rank of 7 means the city had the lowest wage. It is immediately apparent that Providence, with ranks of 4 and 5, has lower-than-average wages. Other data on comparative wage structures are consistent with this finding:

TABLE III

INCOME DISTRIBUTION BY FAMILIES

	Providence, R. I.		Austin, Texas		Charlotte, N. C.		Grand Rapids, Mich.		Jacksonville, Fla.		Mobile, Ala.	
	# of Families	% of Total	#	%	#	%	#	%	#	%	#	%
Less than \$1,000	2385	4.4	2126	4.9	2085	4.1	1330	3.0	3282	6.7	4806	6.5
\$1,000 - 1,999	4352	8.1	3416	7.9	3436	6.8	2567	5.8	5503	11.2	6525	8.8
2,000 - 2,999	4998	9.3	4904	11.4	5026	10.0	3016	6.8	6425	13.0	7484	10.1
3,000 - 3,999	6997	13.1	5244	12.2	5817	11.6	3637	8.3	6844	13.9	8022	10.8
4,000 - 4,999	7513	14.0	5225	12.1	5385	10.7	4795	10.9	5944	12.1	8929	12.1
5,000 - 5,999	7495	14.0	4983	11.6	5740	11.4	6308	14.3	5497	11.2	9289	12.6
6,000 - 6,999	5448	10.2	4104	9.5	5107	10.2	5580	12.7	4373	8.9	7650	10.3
7,000 - 7,999	4173	7.8	3225	7.5	4089	8.1	4399	10.0	3105	6.3	5574	7.5
8,000 - 8,999	2733	5.1	2260	5.3	3227	6.4	3399	7.7	2281	4.6	4167	5.6
9,000 - 9,999	1870	3.5	1774	4.2	2248	4.5	2350	5.3	1519	3.1	2898	3.9
10,000 -14,999	3552	6.6	3694	8.6	5041	10.0	4994	11.3	3044	6.2	6499	8.8
15,000 -24,999	1255	2.3	1370	3.2	1950	3.9	1286	2.9	939	1.9	1523	2.2
25,000 - over	749	1.4	695	1.6	1147	2.3	408	.9	503	1.0	627	.8
TOTAL	53520	100.0	43020	100.0	50298	100.0	44069	100.0	49259	100.0	73993	100.0
Less Than \$5,000	48.9		48.5		43.2		34.8		56.9		48.3	
More Than \$10,000	10.3		13.4		16.2		15.1		9.1		11.8	

Source: U. S. Census of Population 1960

TABLE III (Continued)

	Richmond, Va.		Salt Lake City, Utah		San Jose, Calif.		Spokane, Wash.		Syracuse, N. Y.		Worcester, Mass.	
	# of Families	% of Total	#	%	#	%	#	%	#	%	#	%
Less than \$1,000	3072	5.7	1343	2.8	1374	2.7	1110	2.4	1618	3.0	1286	2.7
\$1,000 - 1,999	4397	8.2	2430	5.1	2001	3.9	2859	6.1	2512	4.6	2502	5.3
2,000 - 2,999	5624	10.4	3063	6.5	2486	4.9	3608	7.7	3393	6.3	3428	7.3
3,000 - 3,999	6424	11.9	4002	8.5	3023	6.0	4273	9.1	4443	8.2	4531	9.7
4,000 - 4,999	6498	12.1	5689	12.0	4085	8.0	4928	10.5	6179	11.4	6038	12.8
5,000 - 5,999	5894	10.9	6363	13.4	6275	12.4	6494	13.8	7427	13.7	7077	15.0
6,000 - 6,999	4743	8.8	5721	12.1	6495	12.8	5822	12.4	6260	11.5	5833	12.4
7,000 - 7,999	4081	7.6	4555	9.6	5989	11.8	4624	9.8	5379	9.9	4406	9.4
8,000 - 8,999	3001	5.6	3464	7.3	5045	9.9	3664	7.8	4115	7.6	3178	6.8
9,000 - 9,999	2183	4.1	2450	5.2	3485	6.9	2480	5.3	3125	5.8	2154	4.6
10,000 - 14,999	5072	9.4	5586	11.8	8121	16.0	5044	10.7	6852	12.6	4512	9.6
15,000 - 24,999	1780	3.3	1834	3.9	1800	3.6	1522	3.2	2175	4.0	1412	3.0
25,000 - over	1095	2.0	821	1.8	634	1.2	628	1.3	762	1.4	588	1.3
TOTAL	53864	100.0	47321	100.0	50813	100.0	47056	100.0	54240	100.0	46945	100.0
Less Than \$5,000	48.3		34.9		25.5		35.8		33.5		37.8	
More Than \$10,000	14.7		17.5		19.7		15.2		18.0		13.9	

Source: U. S. Census of Population 1960

TABLE IV
 OCCUPATIONAL WAGES 1961
 (Average wage rates)

	Providence, R. I.	Charlotte, N. C.	Jackson- ville, Fla.	Richmond, Va.	Salt Lake City, Utah	Spokane, Wash.	Worcester, Mass.
Office Occupa- tions	Rank						
	Wages/ wk.						
Professional & Technical Occupations	4	\$65.55	6 \$64.66	3 \$69.10	7 \$59.44	1 \$74.70	2 \$69.52
	5	95.93	6 92.26	1 102.64	4 96.44	Note ¹	2 105.71
Maintenance & Power Plant Occupations	Rank						
	Wages/ hr.						
Custodial & Material Mov- ing Occupa- tions	5	\$2.36	7 \$1.99	4 \$2.27	2 \$2.65	1 \$2.98	3 \$2.59
	4	1.84	5 1.67	7 1.51	6 1.55	3 1.97	2 1.98

Note 1. Data do not meet publication criteria.

Source: U. S. BLS Occupational Wage Survey 1285 Series

Providence ranks near the bottom for major labor markets.¹

The occupational structure of employment in Providence has changed considerably in several respects between 1954 and 1961, the two benchmark dates for which we make our comparisons. These figures indicate that Providence has continued in a state of transition in the past decade from the marked changes that occurred after World War II. Table V presents covered employment in the major broad industry categories, although the totals fall short of Providence employment in both years. This is due to the unavailability of data for government employment and employment in certain service categories which are not covered by the employment compensation fund.

TABLE V
EMPLOYMENT IN PROVIDENCE BY MAJOR INDUSTRY CLASS
1954 AND 1961

Industry	1954	1961
	# Employed	# Employed
Contract Construction	4,758	3,984
Manufacturing	52,522	44,527
Transportation and Public Utilities	9,932	9,023
Wholesale Trade	8,689	8,434
Retail Trade	16,876	15,363
Insurance, Finance and Real Estate	9,296	10,160
Selected Services	6,055	6,271

Source: Department of Employment Security

Certainly the most remarkable change that occurred during this period was the substantial decline in manufacturing employment. This involved a loss of approximately 8,000 jobs, or 15 per cent of

1. For further evidence see the occupational wage surveys and wage structure studies of the Bureau of Labor Statistics, U. S. Department of Labor.

the 1954 employment level.

Where the structure of manufacturing employment is such that a relatively few large firms hire a large part of the manufacturing labor force, and a large number of firms employ the remainder, the removal of even one of the former to another region can cause serious employment repercussions. If Providence is to recover its former position as a manufacturing center, or even to stabilize at present levels, it is not merely necessary to attract a growing number of small firms. Even more critical is the problem of keeping the operations of large employers in the area. Industrial site development plans should take their potential needs into account, even at the expense of perhaps not being able to meet at the same time those of small firms. The loss of one major manufacturing employer in Providence between 1954 and 1961 is strongly reflected in the employment statistics of Table V.

PART II: EMPLOYMENT PROJECTIONS

A. Introduction

One of the basic tasks of the Economic Foundation Study has been to formulate estimates of employment in various occupational categories for the years 1965, 1970, and 1975. The methods employed for prediction generated estimates of personal income and sales volumes in retail trade, wholesale trade, and selected services.¹

The hazards of prediction in the social sciences are legion, and even the best techniques can provide poor estimates, for no other reason than unforeseeable events occur in any dynamic economy, e.g., a drastic liberalization of trade between the United States and other countries. This poses the question of the proper interpretation of the employment estimates. Basically they have been made on the assumption that no drastic social, political, or economic changes of an institutional nature would occur. Specifically, it has been assumed that certain patterns of national growth would occur and that local conditions influencing economic activity would remain constant in Rhode Island relative to the Nation as a whole.

This implies that a worsening of local conditions--essentially the costs of conducting economic activities--could result in a failure to meet the projected employment levels. The converse is also true. It should be further recognized that stationary local conditions may result in a deterioration in the relative position of Rhode Island and the City of Providence.

We are acutely aware of the possibility that even the projections for broad industry classes, such as manufacturing, may prove inaccurate. The estimates are essentially small-number estimates

1. The projections of personal income and sales volume are not included in this report; they are available on the worksheets.

and the location decision by a single large firm entering or leaving Providence could produce significant deviations from the predictions. Projections must be based on the economic behavior of aggregates of firms and cannot take into account the special circumstances that affect the decision of an individual firm.

As stated above, employment estimates were made for 1965, 1970, and 1975. Obviously the more distant the estimating horizon, the greater the possibility that random changes will occur to upset our projections. We therefore strongly urge periodic revision of the projections, to take into account changed conditions and more complete information, for purposes of continued planning.

B. Methodology

The techniques used for estimating employment varied from one major industry category to another. The general procedure was to formulate a number (or a sequence) of alternative prediction models (including the naïve model of simple trend extrapolation) for each industry classification and to choose that model which, on test, proved most powerful, i.e., yielded the smallest prediction errors.

In simple terms, a prediction model is a mathematically stated relationship between the variable to be estimated and a set of economic determinants. The construction of a model poses two problems, namely, (1) the form of the structural equations connecting the variables and (2) the availability and accuracy of the data. Limitations on data, as well as considerations of complexity, usually make it necessary to restrict the number of variables entering the model. In practice, a model (or a set of models) is selected on an a priori basis and its characteristics tested. Alternative models (or sets) are then formulated by the addition or substitution of other variables. This process will generally reveal, on some criterion, which are the important variables to include in the model. Similar remarks can be made with respect to the selection of the

structural equations.

The models constructed have essentially exhausted all available information on the individual industrial categories. In each case the models were "run" to predict employment in periods for which actual employment was known. Statistical significance tests were also carried out. Models which performed significantly better than their alternatives were finally chosen to make the estimates for 1965, 1970, and 1975. It might be noted that for consistency only one model was employed within any broad industrial category.

The specific techniques employed for each industry category will be briefly described in sections E, F, G, and H below.

C. The Data

Except for simple trend extrapolation, prediction models require employment data cross-classified with other economic variables such as value added by manufacture, value of shipments, and sales in trade and services. Data with these characteristics are not available in a single source. In this study four principal sources of employment statistics have been used: (1) employment covered by state unemployment insurance programs; (2) the Census of Manufacturers; (3) the Census of Business; and (4) employment and earnings statistics compiled under the Bureau of Labor Statistics program. Supplementary data have been drawn from County Business Patterns, published jointly by the U. S. Departments of Commerce and Health, Education and Welfare and from the government employment reports of the Bureau of the Census.

Employment data from these sources are not comparable. It will be useful to review the basic differences among these series. The BLS series cover all non-agricultural wage and salary employment for major industry categories as defined by the Standard Industrial Classification (SIC). Monthly employment is estimated from a sample of establishments, and benchmark adjustments (usually on the basis of covered employment) are made annually. Thus, the benchmark is

used to establish the level of employment, and the sample determines the monthly changes in the level.

Covered employment in state unemployment insurance programs are full counts, but not all non-farm wage and salary workers are covered. Workers in certain categories such as government, certain service industries and interstate railroads, are excluded. In addition, small firms (employing less than four workers in the case of Rhode Island) are excluded. In Rhode Island covered employment is tabulated by industry category and by city and town.

Employment statistics tabulated by the Bureau of the Census differ from the BLS series by virtue of a different definition of business units considered parts of an establishment, the classification of establishments by industry group, and the exclusion in the Census of Business of contract construction, public utilities and transportation, and financial establishments.

Moreover, Bureau of Census data is reported as of a specified week in the census year (quinquennial census), whereas other tabulations involve averages of monthly or quarterly employment.

Employment series are subject to change because of revisions in method or definition, and data covering long periods of time are frequently non-comparable. Hence, for a number of reasons, considerable attention must be given to the reconciliation of the data.¹

1. In some cases a revision of employment series may produce gross distortions. For example, the BLS program was revised such that employment in contract construction was reduced by approximately 25 per cent. The original employment projections for contract construction made in this study prior to the revision were accordingly too high. All projections based on BLS employment statistics have been reworked to reflect the revision; only contract construction was appreciably affected.

As a basis for the interpretation of the employment projections the employment structures for the State of Rhode Island, the Providence-Pawtucket Standard Metropolitan Area (PSMA) and the City of Providence are shown in Tables VI - VIII. Data are presented for the years 1958, 1960 and 1962. The years 1958 and 1960 were chosen because they represent important benchmark dates for a number of projections, and 1962 served as a check-point for some estimates; no other significance should be attached to these dates. Except for the PSMA, both covered employment compiled by the Rhode Island Department of Employment Security (DES) and the BLS employment estimates are included in the tables.

The differences between covered employment and total employment are immediately apparent from Tables VI and VIII. Minor differences exist with respect to manufacturing, retail and wholesale trade, construction, finance, insurance and real estate. Covered employment in services accounts for approximately one half of total employment, and government employment is not included at all.

Total employment for the City of Providence has been estimated. For manufacturing, trade, construction, transportation and public utilities, and finance, insurance and real estate the estimates are based on the assumption that covered employment bears the same ratio to total employment for Providence as for the state as a whole. Government employment (i.e., place of work in Providence) is a composite of three numbers. Local government is an actual count as reported by the Bureau of the Census. Federal government employment in Providence is computed by applying an historically established ratio: $\frac{\text{Federal employment in Providence}}{\text{Federal employment in Rhode Island}}$ to the total Federal employment in Rhode Island.

The estimate of state government employment in Providence is based on an allocation of state employment by function to facilities in Providence and elsewhere in the state. Employment by function is reported in the 1957 Census of Governments published by the Bureau

TABLE VI
EMPLOYMENT IN RHODE ISLAND, BY
MAJOR INDUSTRY GROUP, 1958, 1960 AND 1962

(Thousands)

Industry Group	Covered Employment (DES)			Total Employment (BLS)		
	1958	1960	1962	1958	1960	1962
Manufacturing	113.2	119.3	118.6	113.2	119.7	118.9
Trade	51.6	53.5	55.2	51.2	53.5	55.2
Construction	11.5	11.9	12.2	11.5	11.9	12.3
Transportation & Public Utilities	13.4	13.4	13.5	14.8	14.6	14.6
Finance, Insurance & Real Estate	11.9	12.3	12.8	12.0	12.6	13.0
Service ¹	17.2	18.2	20.1	35.3	39.3	42.4
Government	--	--	--	38.8	40.1	41.9
Total Wage and Salary Employment	218.9	228.7	232.4	276.8	291.7	298.3
All Other ²	1.0	1.1	1.2	37.8	37.6	34.0
Total ³	219.9	229.8	233.6	314.6	329.3	332.3

Notes: (1) Includes mining.

(2) Agriculture, forestry and fishing, self-employed domestics, etc.

(3) Detail may not add to total because of rounding.

Source: Rhode Island Department of Employment Security, Rhode Island Department of Labor, Division of Statistics and Census.

TABLE VII
EMPLOYMENT IN THE PROVIDENCE-PAWTUCKET METROPOLITAN AREA,
BY MAJOR INDUSTRY GROUP, 1958, 1960 AND 1962

(Thousands)

Industry Group	Total Employment (BLS)		
	1958	1960	1962
Manufacturing	124.4	132.8	131.1
Trade	50.6	52.7	54.1
Construction	11.4	11.8	12.1
Finance, Insurance & Real Estate	11.9	12.6	13.0
Transportation & Public Utilities	14.2	14.1	14.2
Service	33.3	37.3	39.6
Government	32.3	33.5	34.1
Total Wage and Salary Employment	278.1	294.8	298.2

Source: U. S. Department of Labor, Bureau of Labor Statistics,
Employment and Earnings Statistics for States and Areas,
1939-62, 1963.

TABLE VIII
 EMPLOYMENT IN PROVIDENCE, BY MAJOR
 INDUSTRY GROUP, 1958, 1960 AND 1962

(Thousands)

Industry Group	Covered Employment (DES)			Total Employment		
	1958	1960	1962	1958	1960	1962
Manufacturing	47.0	47.1	44.6	47.0	47.2	44.7
Trade	27.1	25.0	24.2	27.1	25.0	24.2
Construction	4.0	4.1	3.7	4.0	4.1	3.7
Transportation & Public Utilities	9.3	9.2	9.0	10.2	10.1	9.8
Finance, Insurance & Real Estate	9.8	10.1	10.2	9.9	10.3	10.4
Service ¹	8.7	8.8	9.3	16.6	17.3	18.9
Government	--	--	--	11.2	11.9	12.2
Total Non-Agricultural Wage & Salary Employment ²	106.0	104.3	101.0	126.0	125.9	123.9
Other	0.1	0.1	0.1	(3)	(3)	(3)

Notes: (1) Includes mining.

(2) Detail may not add to total because of rounding.

(3) Not estimated.

Source: Rhode Island Department of Employment Security.

of the Census (1958).

Estimates of service employment in Providence required a more elaborate procedure. County Business Patterns reports first quarter employment (at 3-year intervals) which includes: (1) all covered wage and salary employment under compulsory coverage (DES) and (2) all employment covered under the elective provisions of the Federal Insurance Contributions Act. Employment in the latter category is heavily concentrated in hospital and education industries and non-profit membership organizations. These sub-groups account for nearly 70 per cent of the difference between total service employment and covered employment reported by the DES.

Employment in health services, as reported by County Business Patterns, is allocated to Providence on the basis of actual hospital employment in Providence and Rhode Island (data compiled by the Hospital Association of Rhode Island). Employment in educational services (private education) is allocated on the basis of actual counts. Employment in non-profit membership organizations is allocated by a factor determined by the proportion of employment in Providence County and the ratio of population in Providence to that in Providence County. The residual not accounted for by County Business Patterns is allocated to Providence by the same method.

D. Summary of Projected Employment, 1965, 1970 and 1975

The projected nonagricultural wage and salary employment, by major industry groups, for the State of Rhode Island, the Providence-Pawtucket Standard Metropolitan Area, and the City of Providence is summarized in Tables IX-XI. These estimates exclude employment in agriculture, forestry and fishing, the self-employed, domestics and some others. Currently, about 34 thousand members of the Rhode Island labor force are in this category.

All employment projections presented in this and other sections of the report are consistent with the industry and firm classifications currently being used in published employment series (DES and BLS). The original estimates made in 1961 on the basis of the existing data have been revised to reflect the changes in definition and classification which have occurred since then. It may be noted that since the basic statistics are subject to further revisions, care must be exercised in future comparisons of projected and realized employment.

The expected annual rates of growth in nonagricultural wage and salary employment for the period 1958-70 and 1958-75 are 1.4 per cent for Rhode Island and 1.5 per cent for the PSMA. These rates are substantially below the expected national growth rate. The expected growth rate for the City of Providence for these periods is only 0.2 per cent -- a rate of growth which is less than reasonable errors of prediction.

As expected from national growth patterns, nonmanufacturing employment will increase at substantially higher rates than manufacturing employment. In the period 1958-75, the expected growth rate in Rhode Island is 34.1 per cent for nonmanufacturing and 15.3 per cent for manufacturing. Corresponding percentages for the PSMA and the City of Providence are 34.1 and 22.3 per cent, and 5.3 and 0.8 per cent respectively (see Table XII). As a result

TABLE IX
 PROJECTED EMPLOYMENT IN RHODE ISLAND,
 BY MAJOR INDUSTRY GROUP, 1965, 1970 and 1975

(Thousands)

Major Industry Group	Number Employed			
	Actual 1958	Projected		
		1965	1970	1975
Manufacturing	113.3	119.2	124.8	130.5
Trade	51.2	56.4	59.2	62.5
Construction	11.5	13.0	13.5	14.0
Trans. & Pub. Util.	14.8	14.0	13.1	12.2
Fin., Insur. & Real Est.	12.0	14.2	15.5	16.8
Service ¹	35.2	44.4	51.6	60.7
Government	38.8	44.3	49.3	53.0
Total Nonagric. Wage & Salary Employment	276.8	305.3	327.0	349.7

Note: (1) Includes mining.

TABLE X
PROJECTED EMPLOYMENT IN THE PROVIDENCE-PAWTUCKET
STANDARD METROPOLITAN AREA BY MAJOR INDUSTRY GROUP,
1965, 1970 and 1975

(Thousands)

Major Industry Group	Number Employed			
	Actual 1958	Projected		
		1965	1970	1975
Manufacturing	124.4	133.8	143.0	152.2
Trade	50.6	55.6	57.2	59.2
Construction	11.4	13.8	14.6	15.5
Trans. & Pub. Util.	14.2	13.4	12.4	11.5
Fin., Insur. & Real Est.	11.9	13.8	14.9	16.0
Service	33.3	42.9	50.0	59.0
Government	32.3	37.3	41.0	44.9
Total Nonagric. Wage & Salary Employment	278.1	310.6	333.1	358.3

TABLE XI
 PROJECTED EMPLOYMENT IN PROVIDENCE,
 BY MAJOR INDUSTRY GROUPS, 1965, 1970 and 1975

(Thousands)

Major Industry Group	Number Employed			
	Actual 1958	Projected		
		1965	1970	1975
Manufacturing	47.0	47.9	47.8	47.4
Trade	27.1	23.5	22.7	22.0
Construction	4.0	4.1	3.8	3.5
Trans. & Pub. Util.	10.2	9.2	8.1	7.2
Fin., Insur. & Real Est.	9.9	11.1	11.5	11.9
Service	16.6	19.6	21.7	24.8
Government	11.2	12.3	13.1	13.7
Total Nonagric. Wage & Salary Employment	126.0	127.7	128.7	130.5

of these differential rates the relative importance of non-manufacturing employment will continue to increase.

The industry components of nonmanufacturing employment exhibit sharp differences in growth rates. In Rhode Island and the PSMA, employment in transportation, communications and public utilities is expected to decline approximately 20 per cent between 1958 and 1975. All other categories will increase with the largest rate of growth expected in services. (See Table XIII).

Providence will experience substantially lower growth rates. Employment in retail and wholesale trade, construction and transportation, communications and public utilities will decline -- by as much as 30 per cent in the case of transportation and public utilities. The rates of growth in finance, insurance and real estate and in services are positive. Service employment is expected to increase by nearly 50 per cent between 1958 and 1975.

In succeeding sections, the employment projections for the major industrial groups will be discussed in detail.

E. Projections of Manufacturing Employment

a. Procedure

In brief the prediction of manufacturing employment consisted of three major steps:

(1) Employment for each two- and three-digit industry was predicted and growth rates calculated on a national level.

(2) A differential rate of growth between Rhode Island and the United States was predicted by means of the Borts-Stein model.¹

1. Borts, G. H. and Stein, J. L., "Investment Return as a Measure of Comparative Regional Economic Advantage," in Design of Regional Accounts, Werner Hochwald (ed.), published for Resources for the Future, Inc., The Johns Hopkins Press, Baltimore, 1961, pp. 69-103.

TABLE XII

PERCENTAGE DISTRIBUTION AND INDEX NUMBERS,
 MANUFACTURING AND NON-MANUFACTURING
 WAGE AND SALARY EMPLOYMENT, 1958 and 1962 (ACTUAL),
 1965, 1970 AND 1975 (PROJECTED).

Area and Year	Percentage Distribution		Index Numbers, 1958 = 100		
	Mfg.	Non-Mfg.	Mfg.	Non-Mfg.	Total
<u>Rhode Island</u>					
1958	40.9	59.1	100.0	100.0	100.0
1962	39.9	60.1	105.0	109.6	107.8
1965	39.0	61.0	105.3	113.8	110.3
1970	38.1	61.9	110.2	123.7	118.2
1975	37.3	62.7	115.3	134.1	126.4
<u>PSMA</u>					
1958	44.7	55.3	100.0	100.0	100.0
1962	44.0	56.0	105.4	108.7	107.2
1965	43.1	56.9	107.6	115.0	111.7
1970	42.9	57.1	115.0	123.7	119.8
1975	42.5	57.5	122.3	134.1	128.8
<u>Providence</u>					
1958	37.3	62.7	100.0	100.0	100.0
1962	36.1	63.9	95.1	100.2	98.3
1965	37.5	62.5	101.9	101.0	101.3
1970	37.1	62.9	101.7	102.5	102.2
1975	36.3	63.7	100.8	105.3	103.6

TABLE XIII

INDEX NUMBERS, NON-MANUFACTURING WAGE
AND SALARY EMPLOYMENT, BY MAJOR INDUSTRY GROUP,
1962, 1965, 1970 AND 1975. (1958 = 100)

Major Group	Index Numbers				
	1958	1962	1965	1970	1975
<u>Rhode Island</u>					
Trade	100.0	107.8	110.2	115.6	122.1
Construction	100.0	107.0	113.0	117.4	121.7
Trans. & Pub. Util.	100.0	98.6	94.6	88.5	82.4
Fin., Ins. & Real Est.	100.0	108.3	118.3	129.2	139.2
Service	100.0	120.1	125.2	146.2	172.0
Government	100.0	108.0	114.2	127.1	136.6
<u>PSMA</u>					
Trade	100.0	106.9	109.9	113.0	117.0
Construction	100.0	106.1	121.0	128.1	136.0
Trans. & Pub. Util.	100.0	100.0	94.4	87.3	81.0
Fin., Ins. & Real Est.	100.0	109.2	116.0	125.2	134.4
Service	100.0	118.9	128.8	150.2	177.2
Government	100.0	105.6	115.5	126.9	139.0
<u>Providence</u>					
Trade	100.0	89.3	86.7	83.8	81.2
Construction	100.0	92.5	102.5	95.0	87.5
Tran. & Pub. Util.	100.0	96.1	90.2	79.4	70.6
Fin., Ins. & Real Est.	100.0	105.0	112.1	116.2	120.2
Service	100.0	113.8	118.1	130.7	149.4
Government	100.0	108.9	109.8	117.0	122.3

(3) The two growth rates were combined to form a predicted growth rate of manufacturing employment in Rhode Island. These growth rates were then used to project 1958 base employment to 1965, 1970 and 1975.

Each of these steps will be discussed in some detail.

The Bureau of the Census classifies all manufacturing industries according to the Standard Industrial Classification (SIC). The SIC provides industry descriptions on three levels of specialization identified as two-digit, three-digit and four-digit industries. The two-digit basis relates to major industrial groups such as textile mill products, whereas three-digit and four-digit classes refer to subgroups and specific industries.

The four-digit classification is too finely divided for purposes of predicting employment in a data unit as small as Rhode Island. This is true because it is common for a given manufacturing establishment to produce more than one product; for example, a textile mill might produce both cotton yarn and cotton thread, yet these are different four-digit industries. A plant is classified in only one industry and this is done on the basis of the "major product." No data are available which specify the relevant statistics by product within the plant. The major product of a plant can and often does change from year to year, and as a consequence a majority of the four-digit data are not comparable over time. As these product variations may be expected to continue, little reliance can be placed on predictions based on the four-digit industries for small aggregates such as Rhode Island. Hence, the analysis will include only two-digit and three-digit industries.

The prediction of employment on the national level was based on estimates published by the Bureau of Labor Statistics for two-digit manufacturing industries. These estimates were developed by first determining expected total employment in all manufacturing and then predicting employment in each two-digit industry on the basis of

past performance. In this study a similar method was used for extending predictions to the three-digit classifications. The BLS estimates for two-digit industries were taken as "targets" and three-digit industry employment was predicted on the basis of past performance.

The prediction of a differential growth rate was based on the Borts-Stein model. The central idea underlying this model is that employment will increase in a given section of the nation relative to the nation as a whole if profits are above average, and will decline (relatively) if profits are below average. To use this model, techniques must be developed to measure the rate of return on investment and the rate of growth of employment.

The rate of return on new investment (for convenience called the "rate of profit") for any given time period can be determined by finding the increment in profit (profit in terminal year minus profit in initial year) and dividing by total investment on new plant and equipment during the period. Profit data in the form required are not directly available, but they can be approximated by subtracting the cost of materials and labor from the total value of goods shipped from manufacturing establishments. Thus, for any section of the country, the (gross) rate of profit for a given period can be measured. This was done for both the United States as a whole and for Rhode Island. A differential rate of profit μ (mu) was defined by $\mu = \text{profit rate (R. I.)} - \text{profit rate (U. S.)}$.

The rate of growth in employment may be easily calculated and such rates were computed for both the United States and Rhode Island. A differential rate of growth, λ (lambda) was defined by $\lambda = \text{employment growth rate (R. I.)} - \text{employment growth rate (U. S.)}$.

The next step was the determination of the structural relationship between μ and λ with high predictive power. If such a relation, expressed in the form of a regression equation, could be found to have a high degree of predictive accuracy, then differential growth

rates of employment could be predicted for future years with present data on profit rates. In other words, for a regression equation, say, $\lambda = a\mu + b$, future λ could be predicted with data on present μ , since a higher-than-average local rate of profit ($\mu > 0$) would tend to produce a higher-than-average growth in employment ($\lambda > 0$) in the future.

Several regression equations relating to different time periods were examined and tested for predictive accuracy. λ and μ were calculated for the period 1939-47, 1947-54 and 1954-58, these periods being fixed by the years in which a census of manufactures was taken. These data were then fitted to various regression equations by the method of least-squares.

Ideally one could determine a regression equation between λ and μ for each two-digit industry, using the three-digit sub-classifications for the data. Because of the disclosure rules this was not possible in most cases. There were on the average fifty to sixty subindustrial classifications for which data were available. These data were scattered to the extent that regression equations could be formed only from the following sets:

(1) All two-digit industries with five or more three-digit industries for which Rhode Island data were available. These were (although not necessarily for all three time periods) SIC #20 - Food, #22 - Textile Mill Products, #27 - Printing and Publishing, #34 - Fabricated Metal Products, #35 - Machinery, and #39 - Miscellaneous Manufacturing (this SIC category contains Jewelry and Silverware).

(2) A single regression equation including all two-digit industries.

(3) A single regression equation involving all observations. Two-digit observations were omitted if the data were almost completely included in the three-digit subclassifications.

A regression equation of type (3) was computed only if correlation coefficients of equations of type (1) and (2) were not significant at the 0.05 level. There was no need to compute such a generalized regression equation for the 1947-54 period, but it was necessary for the 1939-47 and 1954-58 periods. On the basis of significance tests the following equations were selected for further testing:

$$1937-47: \quad \lambda = 31.0\mu - 25.4$$

$$1947-54: \quad \lambda = 29.8\mu + b \hat{\lambda}; \quad \text{the } b \hat{\lambda} \text{ depending on the intercepts of the regression equations for the individual groups.}$$

$$1954-58: \quad \lambda = 6.8\mu + 1.1$$

Each of these regression equations was tested in the same manner. As an example, consider the 1954-58 equation, $\lambda = 6.8\mu + 1.1$. To measure the predictive accuracy of this equation the values of μ from the periods 1937-47 and 1947-54 were substituted in the 1954-58 equation to obtain a predicted λ . The amount by which this predicted λ differed from the true (observed) λ was the actual error. This error was then compared to errors resulting from estimates of λ for 1954-58 which were obtained by various naive models (frequently used for projections). The same procedure was repeated for the 1939-47 and 1947-54 equations to determine which one predicted growth in employment most accurately.

The four naive models, as taken from the Borts-Stein study, may be described as follows:

(1) The differential rate of growth of employment between Rhode Island and the United States of each industry for the periods 1939-47 and 1947-54 is zero, i.e., each industry in Rhode Island grew at the same rate as its national counterpart. ($\lambda_{39} = 0$ and $\lambda_{47} = 0$).

(2) The differential rate of growth of employment of each industry equals the average differential rate of growth for all

industries for 1954-58, and the growth rate for 1947-54 equals the average rate for 1954-58. ($\lambda_{39} = \bar{\lambda}_{54}$ and $\lambda_{47} = \bar{\lambda}_{54}$).

(3) The differential rates of growth of employment for 1954-58 equal those for 1939-47, and the growth rates for 1954-58 equals those for 1947-54, i.e., simple extrapolation ($\lambda_{54} = \lambda_{39}$ and $\lambda_{54} = \lambda_{47}$ with $\lambda_{39} \geq \lambda_{47}$).

(4) The differential rate of growth of each industry for 1939-47 equals the differential rate of growth of each industry for 1954-58, minus a compensatory factor equal to one-half the difference of the individual and average differential growth rates for 1954-58. The growth rates for 1947-54 equal those for 1954-58 minus the same compensatory factor for the 1954-58 period.

$$(\lambda_{39} = \lambda_{54} - 1/2 [\lambda_{54} - \bar{\lambda}_{54}] \quad \text{and} \quad \lambda_{47} = \lambda_{54} - 1/2 [\lambda_{54} - \bar{\lambda}_{54}]).$$

Based on the results of the comparison with the four naive models it was clear that the regression equation for 1954-58, namely $\lambda = 6.8\mu + 1.1$, yielded the most satisfactory results. Hence, this equation was used to predict λ during 1965, 1970, and 1975.

The differential rates of employment growth for Rhode Island as predicted by the selected equation were added to the national growth ratio to obtain Rhode Island growth rates for all two- and three-digit industries for 1965, 1970 and 1975. The base year for the projections was 1958.

Upper and lower bounds for the Rhode Island growth ratio were also established. During the period 1919-58 manufacturing employment in the country as a whole has increased by 1.0 per cent a year. In viewing this past trend and a continuing relative shift in services (substantially more marked in Rhode Island), the growth rate of 2.0 per cent a year for manufacturing employment predicted by the Bureau of Labor Statistics for the nation as a whole in the period 1958-75 was regarded as the upper level of growth for Rhode Island. Thus, the growth rates based on the Bureau of Labor

Statistics predictions have been taken as the upper bounds of the growth rates for the State of Rhode Island.

During the period 1947-58, it was observed that manufacturing employment in the United States, except for textile mill products, grew at an average yearly rate of 0.9 per cent. During the same period, manufacturing employment in Rhode Island, except for textiles, grew at -0.1 per cent, or at 1.0 percentage unit less per year than the whole economy. In view of the relative trends to service industries (United States in comparison with Rhode Island) it would be unrealistic to assume that Rhode Island would continue to grow at a rate 1.0 percentage unit less than the United States rate. The same bounds for employment growth rates in manufacturing industries, other than textiles, were fixed by this assumption. Since textile mill products are a declining industry both nationally and locally the decline of this industry was continued along an exponential curve based on the data from the 1947-58 period.

Having established a high and low growth rate for the State of Rhode Island, and thus a median growth rate, the 1958 base data in manufacturing employment were multiplied by the appropriate growth rates to generate the projections for 1965, 1970 and 1975. As might be expected, the difference between the high and low projections increased as the time span lengthened. For example, the 1965 low projection was 91 per cent of the high projection, whereas the same ratios for 1970 and 1975 were 84 per cent and 78 per cent respectively.

Employment projections for the Providence-Pawtucket Standard Metropolitan Area (PSMA), Providence County, and the City of Providence were based on the Rhode Island projections. The PSMA includes an area covering 97 per cent of the manufacturing of the State, plus an additional sector of Massachusetts consisting mainly of the Attleboros. Based on past performance, the ratios of

manufacturing employment in the PSMA to employment in the State of Rhode Island for two- and three-digit industries were projected for 1965, 1970 and 1975. These ratios were then multiplied by the appropriate employment projections for the State to yield projections for the PSMA.

Although employment projections for Providence County were made, they are not presented in this report; the estimates are available on worksheets. Manufacturing employment in Providence County comprises 84 per cent of such employment in the State. Since this ratio is large, the base employment for the State was multiplied by the ratio of employment in the county to the State for each industry. These ratios were computed from County Business Patterns.

A somewhat different approach was used for the City of Providence, since only 42 per cent of the Rhode Island manufacturing employment is in Providence. The industry composition is also different, Providence having a much lower percentage of employment in textiles and a higher percentage of employment in fabricated metal products and jewelry and silverware than the State. A differential rate of growth between Providence and Rhode Island was determined for each industry in the period 1954-58. These differential rates of growth were then added algebraically to the growth rates for the State of Rhode Island for the periods 1958-65, 1965-70, and 1970-75. Using the 1958 DES employment as a base, high, low and median estimates were computed for the City of Providence.

b. The Employment Estimates, 1965, 1970 and 1975

The projections of manufacturing employment by two-digit industries for 1965, 1970 and 1975 and rates of change for the periods 1958-1965, 1965-1970 and 1970-1975 for Rhode Island, the PSMA and the City of Providence are shown in Tables XIV - XVI.

TABLE XIV
 EMPLOYMENT PROJECTIONS FOR TWO-DIGIT
 INDUSTRIES, RHODE ISLAND, 1965, 1970, AND 1975

(Thousands)

Industry and SIC Number	Actual 1958	Projections			Percentage Change ⁽¹⁾		
		1965	1970	1975	1958- 1965	1965- 1970	1970- 1975
20 Food Products	5.3	5.5	5.5	5.6	2.4	1.0	1.1
22 Textile Mill Products	29.9	26.3	23.5	21.0	-12.0	-10.6	-10.4
23 Apparel	3.9	3.6	3.2	2.7	-7.3	-13.3	-13.4
24 Lumber & Wood	0.2	0.2	0.3	0.3	9.3	6.5	6.5
25 Furniture	0.5	0.5	0.5	0.5	5.8	-0.8	-0.9
26 Paper & Allied Prod.	2.0	2.4	2.7	2.9	21.9	10.4	9.6
27 Printing & Publishing	3.7	4.0	4.2	4.3	6.6	4.3	4.6
28 Chemicals & Allied Prod.	1.3	1.6	1.8	2.0	19.6	13.2	11.1
29 Petroleum Refining	0.1	0.1	0.1	0.1	8.4	10.0	10.1
30 Rubber & Plastic Prod.	7.2	8.2	9.3	10.5	14.0	14.0	12.7
31 Leather	1.1	1.2	1.2	1.3	5.0	4.5	4.8
32 Stone, Glass & Clay Prod.	2.2	2.4	2.6	2.8	9.8	7.9	7.4
33 Primary Metals	8.0	8.5	9.0	9.6	5.5	6.8	6.5
34 Fabricated Metal Prod.	8.9	10.3	11.3	12.4	15.5	9.8	10.9
35 Machinery	8.2	9.2	10.9	12.6	12.4	18.3	15.3
36 Elec. Mach. & Equip.	3.6	5.0	6.3	7.6	40.3	25.4	21.0
37 Trans. Equipment	0.9	1.0	1.0	1.0	2.7	0.4	0.3
38 Instruments	3.3	4.2	4.7	5.1	28.2	10.9	8.3
39 Misc. Manufacturing (Incl. Jewelry & Silverware)	22.8	25.0	26.7	28.1	9.3	6.8	5.4
TOTAL (2)	113.3	119.2	124.8	130.5	5.2	4.6	4.6

Note: (1) Rates of change were computed from employment data before rounding.
 (2) Detail may not add to total because of rounding.

TABLE XV
 EMPLOYMENT PROJECTIONS FOR TWO-DIGIT INDUSTRIES-
 PROVIDENCE-PAWTUCKET STANDARD METROPOLITAN AREA,
 1965, 1970 AND 1975.

(Thousands)

Industry and SIC Number	Actual 1958	Projections			Percentage Change ⁽¹⁾		
		1965	1970	1975	1958- 1965	1965- 1970	1970- 1975
20 Food Products	5.2	5.4	5.4	5.5	2.8	1.2	1.4
22 Textile Mill Products	26.7	23.1	20.3	17.9	-13.7	-12.1	-11.5
23 Apparel	4.0	3.4	3.2	2.8	-15.0	-4.1	-13.1
24 Lumber & Wood	0.2	0.2	0.3	0.3	8.8	8.1	8.2
25 Furniture	0.4	0.5	0.5	0.5	10.4	1.2	0.8
26 Paper and Allied Prod.	2.4	3.1	3.5	3.8	27.9	11.9	11.1
27 Printing and Publishing	3.7	3.9	4.1	4.3	6.4	5.0	4.8
28 Chemicals & Allied Prod.	1.4	1.7	2.0	2.3	25.7	18.0	14.6
29 Petroleum Refining	0.1	0.1	0.1	0.1	12.4	12.0	10.7
30 Rubber & Plastic Prod.	7.6	8.7	9.9	11.2	14.4	14.3	13.0
31 Leather	1.3	1.4	1.5	1.6	7.8	6.6	7.2
32 Stone, Glass & Clay Prod.	2.2	2.4	2.6	2.8	10.3	8.2	7.6
33 Primary Metals	8.9	9.4	10.0	10.6	5.1	6.6	6.0
34 Fabricated Metal Products	11.0	13.3	15.2	17.3	21.2	14.3	13.4
35 Machinery	8.7	9.9	11.9	14.0	13.9	20.3	17.2
36 Elec. Mach. & Equip.	3.7	5.4	6.9	8.6	45.1	28.8	24.2
37 Transportation Equipment	0.9	0.9	0.9	0.9	1.8	2.8	2.0
38 Instruments	5.2	6.6	7.3	7.9	28.3	10.3	7.8
39 Misc. Manufacturing (Inc. Jewlery & Silverware)	30.8	34.4	37.1	39.6	11.8	8.0	6.6
TOTAL ⁽²⁾	124.4	133.8	143.0	152.2	7.6	6.8	6.5

Notes: (1) Rates of change were computed from employment data before rounding.
 (2) Detail may not add to total because of rounding.

TABLE XVI
 EMPLOYMENT PROJECTIONS FOR TWO-DIGIT
 INDUSTRIES, PROVIDENCE, 1965, 1970 AND 1975.
 (Thousands)

Industry and SIC Number	Actual 1958	Projections			Percentage Change ¹		
		1965	1970	1975	1958- 1965	1965- 1970	1970- 1975
20 Food Products	1.8	1.6	1.4	1.2	-11.9	-13.5	-13.3
22 Textile Mill Products	2.2	1.4	0.9	0.5	-38.2	-37.1	-36.9
23 Apparel	0.4	0.4	0.4	0.4	0.5	-5.5	-5.6
25 Furniture	0.3	0.3	0.3	0.3	5.8	-0.6	-1.0
26 Paper & Allied Prod.	0.7	0.9	1.2	1.6	41.5	30.3	29.6
27 Printing & Publishing	2.2	2.2	2.3	2.3	2.3	0.3	0.2
28 Chemicals & Allied Prod.	0.5	0.5	0.4	0.4	-5.5	-12.1	-7.6
30 Rubber & Plastic Prod.	3.1	3.0	2.8	2.7	-3.9	-4.1	-5.6
31 Leather	0.6	0.4	0.3	0.2	-24.3	-24.9	-24.7
32 Stone, Glass & Clay Prod.	0.5	0.7	0.8	1.0	-26.4	24.6	24.0
33 Primary Metals	1.2	1.0	0.8	0.7	-15.9	-14.7	-15.2
34 Fabricated Metals	6.4	7.2	7.7	8.2	12.9	7.1	6.3
35 Machinery	2.5	2.2	2.0	1.8	-13.4	-7.7	-10.8
36 Elec. Mach. & Equip.	2.0	2.3	2.3	2.2	16.1	0.9	-3.5
38 Instruments	2.9	3.7	4.2	4.7	30.6	13.1	10.7
39 Misc. Manufacturing (Incl. Jewelry & Silverware)	19.6	20.0	19.7	19.1	1.6	-1.5	-2.9
All Other	0.1	0.1	0.1	0.1	0.0	0.0	0.0
TOTAL (2)	47.0	47.9	47.8	47.4	2.0	-0.3	-0.6

Notes: (1) Rates of change were computed from employment data before rounding.

(2) Detail may not add to total because of rounding.

The discussion of the projected rates of growth of employment is essentially the same for the State and the metropolitan area since they are largely overlapping. The two-digit industries with the largest expected growth rates in the period 1958-1975 are electrical machinery and equipment (36), instruments (38), machinery (35), chemicals (28), paper and paper products (26), rubber and plastic products (30), and fabricated metal products (34). In each case, the average annual growth is at least two percentage points.

Electrical machinery and equipment has the largest expected growth rate. In Rhode Island and the PSMA this industry consists mainly of electrical wiring devices and electronic tubes and other components. The latter group will account for almost all the growth in the industry; much of the growth will be due to newly developed components and systems.

In instruments (38), newly developed systems and automatic controls will account for most of the growth; mechanical and surgical instruments and ophthalmic goods will grow at a much slower rate. The three-digit components of chemicals and allied products (28) will grow at approximately the same rates except for paints, which will decline. Machinery (35) will have almost all components growing at annual rates in excess of 2 per cent, although machine shops will have a substantially larger growth rate.

The growth in paper products (26) will be due almost entirely to the paper box industry. The components of fabricated metal products that will grow quite rapidly are sheet metal products and metal services; cutlery and heating equipment will continue to decline. Rubber and plastic products in the State and PSMA is composed of the fabricated rubber products industry (SIC No. 3069) -- a medley of products including belts, hoses, sponges, heels and soles, and novelties -- and plastic products. While growth could occur in one or more of the parts of 3069, major growth potential lies in plastic products.

In a somewhat lower growth rate group (between one and two percentage points per annum) are miscellaneous manufacturing (39), stone, glass and clay products (32), and primary metals (33). In miscellaneous manufacturing, the category of costume jewelry and novelties will remain stable, and precious metal jewelry and silverware will decline to about 70 per cent of the 1958 level. Thus, the rise in the two-digit group will be concentrated largely in games, toys, and sports equipment. The subindustries of stone, glass and clay products will increase at essentially the same rate except for cement and concrete products, which will grow at a slightly faster pace. Primary metals (33) is heavily weighted with wire drawing, which will rise. All other categories, especially gray-iron foundries, will decline.

The three-digit components of printing and publishing (27), leather products (31) and food products (20), will grow at approximately the same rate as their two-digit aggregates.

In the group with negative rates of growth, textile mill products (22) will have narrow-woven fabrics, knitting mills and miscellaneous textiles (mainly lace) holding their own but all other groups will decline, with broad-woven fabrics and woollens being the hardest hit. In apparel (23), children's apparel will increase slightly but women's clothing and miscellaneous products (such as curtains) will decline drastically.

The analysis for Providence is somewhat different since (1) many new firms would tend to build outside the city limits and (2) the industry composition in Providence is substantially different from that of the State. Also, several of the two-digit industries employing less than one thousand workers in 1958 were necessarily projected on the two-digit level. This was true for paper products (26), stone, glass, and clay products (32), apparel (23), chemicals (28), and leather products (31). Two of these, namely paper products and stone, glass and clay products, ranked first and second in terms of the rate of growth in the period 1958-1975. The

lack of subindustry detail, however, prevents any analysis of the behavior of three-digit components.

Instruments (38) will grow at essentially the same rate in Providence as in the State and the PSMA. The three-digit components of fabricated metals will grow at the same relative rates in Providence as in the State but, because of composition, the overall growth will be smaller. Electrical machinery and equipment will have a relatively low rate of growth compared to those in the State and the PSMA. This result is due to a larger proportion of electrical wiring devices and a smaller proportion of electric components in Providence.

Industries such as food (20) and printing (27) will be characterized by a more or less even growth (or decline) of their respective components, although newspaper printing will rise at a more rapid rate. Rubber and plastic products (30) consists mainly of miscellaneous fabricated rubber products, which will decline. Machinery (35) will experience a decrease in almost all of its components, with special-industry machinery declining almost to zero. All subindustries in textile mill products (22) will decline, with broad-woven fabrics and woolens disappearing from the scene.

The projected rates of growth of manufacturing employment have clear implications for the future industrial composition in Rhode Island, the PSMA and the City of Providence. These changes are shown in the form of percentage distributions by two-digit industry for 1958 and 1975. (Tables XVII - XIX). The changes expected for Rhode Island and the PSMA are essentially the same: a substantial further loss of employment in textiles and a more than compensating increase in the metals and machinery complex (SIC - 32-38) -- particularly in fabricated metal products, machinery, electrical equipment and instruments -- and in miscellaneous manufacturing (39).

The changes in industry composition in Providence are less dramatic, largely because of the fact that total growth is expected

TABLE XVII

PERCENTAGE DISTRIBUTION BY TWO-DIGIT INDUSTRY,
MANUFACTURING EMPLOYMENT, 1958 AND 1975, AND NET CHANGE,
1958-1975, RHODE ISLAND.

Industry SIC Number	Percentage Distribution		Net Change Thousands
	1958	1975	
20 Food Products	4.7	4.3	0.24
22 Textile Mill Products	26.3	16.1	-8.80
23 Apparel	3.5	2.1	-1.20
24 Lumber and Wood	0.2	0.2	0.05
25 Furniture	0.4	0.4	0.02
26 Paper and Allied Products	1.8	2.2	0.94
27 Printing and Publishing	3.3	3.3	0.61
28 Chemicals and Allied Products	1.2	1.5	0.66
29 Petroleum Refining	0.1	0.1	0.03
30 Rubber and Plastic Products	6.3	8.1	3.33
31 Leather	1.0	1.0	0.17
32 Stone, Glass and Clay Products	1.9	2.1	0.60
33 Primary Metals	7.1	7.4	1.60
34 Fabricated Metal Products	7.9	9.5	3.42
35 Machinery	7.2	9.6	4.38
36 Elec. Machinery and Equipment	3.2	5.8	4.04
37 Transportation Equipment	0.9	0.7	0.03
38 Instruments	2.9	3.9	1.78
39 Miscellaneous Manufacturing	20.2	21.5	5.25
TOTAL	100.0	100.0	17.17

TABLE XVIII

PERCENTAGE DISTRIBUTION BY TWO-DIGIT INDUSTRY,
MANUFACTURING EMPLOYMENT, 1958 AND 1975, AND NET CHANGE
1958-1975, PSMA.

Industry SIC Number	Percentage Distribution		Net Change Thousands
	1958	1975	
20 Food Products	4.2	3.6	0.28
22 Textile Mill Products	21.5	11.8	-8.79
23 Apparel	3.2	1.9	-1.16
24 Lumber and Wood	0.2	0.2	0.06
25 Furniture	0.4	0.3	0.06
26 Paper and Allied Products	1.9	2.5	1.43
27 Printing and Publishing	3.0	2.8	0.63
28 Chemicals and Allied Products	1.1	1.5	0.96
29 Petroleum Refining	0.1	0.1	0.04
30 Rubber and Plastic Products	6.1	7.4	3.63
31 Leather	1.0	1.0	0.30
32 Stone, Glass and Clay Products	1.8	1.8	0.62
33 Primary Metals	7.2	6.9	1.68
34 Fabricated Metal Products	8.8	11.4	6.29
35 Machinery	7.0	9.2	5.28
36 Elec. Machinery and Equipment	3.0	5.6	4.89
37 Transportation Equipment	0.7	0.6	0.06
38 Instruments	4.2	5.2	2.72
39 Miscellaneous Manufacturing	24.7	26.0	8.80
TOTAL	100.0	100.0	27.79

TABLE XIX

PERCENTAGE DISTRIBUTION BY TWO-DIGIT INDUSTRY,
MANUFACTURING EMPLOYMENT, 1958 AND 1975, AND NET CHANGE
1958-1975, PROVIDENCE.

Industry SIC Number	Percentage Distribution		Net Change Thousands
	1958	1975	
20 Food Products	3.9	2.6	-0.63
22 Textile Mill Products	4.7	1.1	-1.67
23 Apparel	0.8	0.8	-0.04
25 Furniture	0.6	0.6	0.01
26 Paper and Allied Products	1.4	3.4	0.93
27 Printing and Publishing	4.7	4.8	0.06
28 Chemicals and Allied Products	1.1	0.8	-0.15
30 Rubber and Plastic Products	6.5	5.6	-0.40
31 Leather	1.2	0.5	-0.33
32 Stone, Glass and Clay Products	1.1	2.2	0.51
33 Primary Metals	2.5	1.5	-0.45
34 Fabricated Metal Products	13.6	17.3	1.53
35 Machinery	5.4	3.8	-0.73
36 Elec. Machinery and Equipment	4.2	4.7	0.26
38 Instruments	6.1	9.9	1.82
39 Miscellaneous Manufacturing	41.8	40.2	-0.56
All Other	0.2	0.2	0.00
TOTAL	100.0	100.0	0.46

to be less than 500 workers in the period 1958-1975. The major changes will be a sharp reduction in textile employment and significant gains in fabricated metal products and instruments. Among the remaining industries about half will gain and half will lose employment with the changes generally of small magnitude.

One of the principal effects of the expected changes in industry components will be the upgrading of the occupational structure of the labor force and hence per worker average income.

F. Employment in Retail Trade, Wholesale Trade, and Selected Services

1. Procedure

Employment projections for the major industry groups discussed in this section involve a common model and depend basically on data compiled in the United States Census of Business. In general, two sets of test models were constructed, namely, models based on population and models based on personal income. The income models yielded more accurate employment estimates than those based either on population or on simple extrapolation and were accordingly selected.

a. Retail Trade

Estimates of 1965, 1970 and 1975 employment in retail trade in Rhode Island and the PSMA are based on three statistical relationships: (1) wages and salaries in manufacturing have long fluctuated between 25 and 30 per cent of personal income in the State and the PSMA; (2) the ratio of sales to employment in retail trade has fluctuated within narrow limits over time; and (3) the correlation between personal income and retail sales is very high ($r = .99$).

Based on estimates for manufacturing employment, by industry subgroup, manufacturing wages and salaries were projected for 1965, 1970 and 1975. High and low estimates of personal income in 1965, 1970 and 1975 were derived from the wage and salary projections and the

high and low ratios of manufacturing wage and salaries to personal incomes. The estimates of personal income correspond closely with estimates made by means of trend extrapolation of per capita income and population projections. Retail sales volumes were estimated from the regressions of retail sales on personal income. The sales volume estimates were translated into employment estimates by the application of the historical ratio of employment to sales.

Data were not available to estimate retail trade employment in Providence by this procedure. Hence, estimates for Providence were made in terms of the ratio of employment in retail trade in Providence to that of Rhode Island as projected by a regression equation.

b. Wholesale Trade

For Rhode Island and the PSMA, wholesale trade employment estimates were derived directly from the estimates of retail sales volume. For both the State and the PSMA, the ratio of wholesale to retail sales has been stable over time. Similarly, the ratio of sales to employment in wholesale trade has been stable. On the assumption that this stability would be maintained, estimates of wholesale trade sales and employment were directly derived. Employment estimates for Providence were then made by scaling the employment estimates for Rhode Island by a ratio projected by a regression equation.

c. Services

Employment in services has been estimated in two parts. The Census of Business covers only those services classified as SIC 70-79 (hotels and lodging places, personal services, miscellaneous business services, automotive repair services, miscellaneous repair services, motion pictures, and amusement and recreation services). This group is called "selected services" by the Census of Business. The remaining services, identified simply as "other services", includes SIC numbers 80-89 (medical and other health services, legal services,

museums, botanical and zoological gardens, nonprofit membership organizations, and miscellaneous services such as engineering, architecture, accounting, etc.). "Other services" constitute approximately 65 per cent of total service employment in Rhode Island.

c.1 Selected Services

Employment in selected services in Rhode Island and the PSMA was estimated by procedures which exactly parallel those employed for retail trade. The estimates for Providence were derived by applying a projected ratio of selected service employment in Providence to that in Rhode Island. This ratio has been declining historically with the loss in central city population.

c.2 Other Services

The procedure used to project employment in selected services cannot be used to estimate employment in "other services" since sales receipts data are not available. The alternative procedure was to (1) establish ratios of employment to personal income in each two-digit service category (80-89) as reported in County Business Patterns over a past period and (2) to derive employment estimates by applying these ratios to a range of estimates of personal income. The employment ratios described in (1) above show a high order of stability and the assumption was made that they would not change significantly in the near future. In order to utilize the maximum amount of data available, information for 1962 was included.

Estimates of employment in "other services" could not be made directly for Providence. A share of the estimated employment in each SIC category for Rhode Island was allocated to Providence on the basis of observed ratios measuring the concentration of these services in Providence. For some two-digit categories such as hospital and medical services a constant ratio was assumed for 1965, 1970 and 1975, but in other cases a time-regressed ratio (declining) was employed in order to reflect the expected decline in the Providence population.

2. The Employment Estimates, 1965, 1970 and 1975

The projected employment in trade and services for 1965, 1970 and 1975 are summarized in Table XX-XXII. Employment in trade will grow moderately in the State and the PSMA, but will decline to a level of approximately 80 per cent of 1958 employment in Providence. The employment loss in Providence will not be uniform for all types of retail and wholesale trade activity; general merchandise and apparel and accessories, for example, will experience substantially smaller rates of decline than trade in general.¹

Service employment, in Rhode Island as elsewhere in the nation, will experience substantial growth. The growth rates will be essentially the same in the State and the PSMA. The employment growth in Providence, while substantial, will be significantly lower. As in the case of retail activities, the growth rates in the two-digit components of services in Providence will not be uniform. Growth in employment in personal services, nonprofit membership organizations, amusements, automotive services, for example, will be tempered by the expected further decline in population. However, services which are associated with central city functions or with existing institutions such as medicine and hospitals, business services and private education will tend to reflect growth in the State (or the PSMA) as a whole.

G. Employment in Contract Construction, Transportation and Public Utilities, and Finance, Insurance and Real Estate

1. Procedure

Employment for the major groups included in this section are based on trend extrapolation. Limitations on data virtually preclude more

1. For an examination of the trends in location of trade and service activities in Rhode Island see Mehta, S. K., Population Redistribution and Business Structure and Location Patterns, Rhode Island 1929-1958, Brown University, 1963 (Small Business Management Research Reports).

TABLE XX

EMPLOYMENT PROJECTIONS, RETAIL TRADE,
WHOLESALE TRADE, AND SERVICES, 1960, 1970 AND 1975.
RHODE ISLAND

Year and Category	Estimates ¹ (Thousands)		
	Expected	High	Low
<u>1965</u>			
Total Trade	56.4	61.5	51.4
Retail	42.2	46.1	38.4
Wholesale	14.2	15.4	13.0
Total Services	44.2	48.2	40.2
Selected	15.1	16.5	13.7
Other	29.1	31.8	26.5
<u>1970</u>			
Total Trade	59.2	64.5	53.9
Retail	44.4	48.5	40.4
Wholesale	14.7	16.0	13.5
Total Services	51.6	56.4	47.0
Selected	17.1	18.7	15.6
Other	34.4	37.6	31.4
<u>1975</u>			
Total Trade	62.5	68.1	56.9
Retail	47.1	51.4	42.8
Wholesale	15.4	16.7	14.1
Total Services	60.7	66.2	55.1
Selected	19.7	21.5	17.9
Other	41.0	44.7	37.2

NOTE: ¹ Detail may not add to total because of rounding.

TABLE XXI

EMPLOYMENT PROJECTIONS, RETAIL TRADE,
WHOLESALE TRADE, AND SERVICES, 1965, 1970 AND 1975.
PSMA

Year and Category	Estimates ¹ (Thousands)		
	Expected	High	Low
<u>1965</u>			
Total Trade	55.6	60.7	50.6
Retail	41.4	45.2	37.6
Wholesale	14.2	15.5	12.9
Total Services	42.9	46.8	39.0
Selected	14.3	15.6	13.0
Other	28.5	31.1	25.9
<u>1970</u>			
Total Trade	57.2	62.4	52.0
Retail	42.1	45.9	38.3
Wholesale	15.1	16.5	13.7
Total Services	49.7	54.2	45.2
Selected	16.3	17.8	14.8
Other	33.4	36.4	30.4
<u>1975</u>			
Total Trade	59.2	64.6	53.8
Retail	43.1	47.1	39.2
Wholesale	16.1	17.6	14.6
Total Services	59.0	64.4	53.6
Selected	18.7	20.4	17.0
Other	40.3	44.0	36.7

NOTE: ¹ Detail may not add to total because of rounding.

TABLE XXII
 EMPLOYMENT PROJECTIONS, RETAIL TRADE,
 WHOLESALE TRADE, AND SERVICES, 1965, 1970 AND 1975.
 PROVIDENCE

Year and Category	Estimates ¹ (Thousands)		
	Expected	High	Low
<u>1965</u>			
Total Trade	23.5	25.7	21.4
Retail	15.0	16.4	13.6
Wholesale	8.5	9.3	7.8
Total Services	19.6	21.3	17.8
Selected	7.0	7.6	6.4
Other	12.6	13.7	11.4
<u>1970</u>			
Total Trade	22.7	24.7	20.6
Retail	14.4	15.8	13.1
Wholesale	8.2	8.9	7.6
Total Services	21.7	23.7	19.8
Selected	7.4	8.1	6.7
Other	14.3	15.6	13.0
<u>1975</u>			
Total Trade	22.0	23.9	20.0
Retail	13.8	15.1	12.5
Wholesale	8.1	8.8	7.4
Total Services	24.8	27.0	22.5
Selected	7.9	8.6	7.2
Other	16.9	18.4	15.3

NOTE: 1 Detail may not add to total because of rounding.

sophisticated methods. For each area -- State of Rhode Island, the PSMA, and the City of Providence -- two estimates were made. The first was based on a linear regression equation, and the second on the average rate of change of employment.

Employment projections for the State and the PSMA were derived by fitting least squares regression equations and by computing the average and the standard deviation (s) of annual employment changes for the period 1947-1961. The data for Providence is for covered employment and refer to a shorter time period. Hence, the Providence projections were based on those for Rhode Island by applying a ratio of Providence employment to Rhode Island employment as determined by a regression equation fitted to such ratios for the period 1947-1961.

2. The Employment Estimates for 1965, 1970 and 1975

Tables XXIII - XXV summarize the employment projections for contract construction, transportation and public utilities, and finance, insurance, and real estate. For estimates based on average rates of change the upper and lower limits are defined at the one standard deviation level. With one exception the estimates yielded by the two methods are in good agreement. Good concordance would be expected whenever annual changes are temporally stable. The exception is the estimates of contract construction employment for the PSMA; projections based on the regression equation are significantly lower than those based on the average rate of change. An examination of the data reveals a low correlation with time and an average rate of change heavily influenced by large annual increments in employment in 1949-50 and 1950-51. Under these circumstances the estimates based on the regression equation appear more reliable. The projections reported in Table X, however, are those based on the average rate of change.

TABLE XXIII

PROJECTED EMPLOYMENT IN CONTRACT CONSTRUCTION,
RHODE ISLAND, PSMA AND PROVIDENCE,
1965, 1970 AND 1975.

(Thousands)

Area and Year	Regression Equation	Average Rate of Change ¹		
		L	Mean	U
<u>Rhode Island</u>				
1965	12.88	12.35	12.96	13.57
1970	13.34	12.85	13.46	14.07
1975	13.80	13.35	13.96	14.57
<u>PSMA</u>				
1965	12.45	13.12	13.76	14.41
1970	12.67	13.98	14.64	15.28
1975	12.88	14.86	15.52	16.16
<u>Providence</u>				
1965	4.03	3.86	4.06	4.25
1970	3.76	3.62	3.80	3.97
1975	3.46	3.35	3.50	3.66

NOTE: (1) L = Mean - Standard Deviation
U = Mean + Standard Deviation

TABLE XXIV
 PROJECTED EMPLOYMENT IN TRANSPORTATION AND PUBLIC UTILITIES,
 RHODE ISLAND, PSMA, AND PROVIDENCE
 1965, 1970 AND 1975.

(Thousands)

Area and Year	Regression Equation	Average Rate of Change ¹		
		L	Mean	U
<u>Rhode Island</u>				
1965	13.65	13.50	14.02	14.54
1970	12.59	12.61	13.13	13.64
1975	11.53	11.72	12.24	12.75
<u>PSMA</u>				
1965	13.15	13.03	13.38	13.73
1970	12.08	12.07	12.42	12.77
1975	11.02	11.11	11.46	11.81
<u>Providence</u>				
1965	8.9	8.8	9.2	9.5
1970	7.8	7.8	8.1	8.4
1975	6.8	6.9	7.2	7.5

NOTE: (1) L = Mean - Standard Deviation
 U = Mean + Standard Deviation

TABLE XXV
 PROJECTED EMPLOYMENT IN FINANCE, INSURANCE AND REAL ESTATE,
 RHODE ISLAND, PSMA, AND PROVIDENCE
 1965, 1970 AND 1975.

(Thousands)

Area and Year	Regression Equation	Average Rate of Change ¹		
		L	Mean	U
<u>Rhode Island</u>				
1965	14.02	13.98	14.21	14.44
1970	15.21	15.27	15.50	15.73
1975	16.41	16.55	16.78	17.01
<u>PSMA</u>				
1965	13.54	13.58	13.84	14.10
1970	14.47	14.67	14.93	15.19
1975	15.40	15.75	16.01	16.27
<u>Providence</u>				
1965	10.91	10.88	11.06	11.23
1970	11.32	11.36	11.54	11.71
1975	11.66	11.76	11.92	12.09

NOTE: (1) L = Mean - Standard Deviation
 U = Mean + Standard Deviation

H. Employment in Government

1. Procedure

Employment projections for government employment at federal, state, and local levels for Rhode Island, the PSMA, and Providence are based essentially on the methods of trend extrapolation described in the previous sections. However, there are differences in procedure with respect to the three areas.

a. Government Employment in Rhode Island

The first stage involved the computation of government employment per 1,000 population for each government level -- federal, state and local. These ratios were then projected by two methods:

(a) linear regression equations fitted by least-squares and (b) the average annual change of each ratio and its standard deviation over the period 1948-1962. The projected ratios were finally converted to employment estimates by multiplying by population estimates for 1965, 1970 and 1975. Of the four series of population estimates published by the U. S. Bureau of the Census that which provided the best estimate of the 1960 population was selected.

The projection of the ratios of employment to population for Rhode Island are shown in Table XXVI.

b. Government Employment in PSMA

Because of the unavailability of data relating to individual levels of government, projections were made for total government employment in the PSMA. The projected government employment per 1,000 population is shown in Table XXVII.

c. Government Employment in Providence

The projections of government employment in Providence (i.e., local employment plus federal and state employees whose place of work is Providence) required a different approach. Time series of federal and state employment in Providence do not exist and these categories

TABLE XXVI
 PROJECTIONS OF GOVERNMENT EMPLOYMENT PER
 1,000 POPULATION FOR ALL LEVELS OF GOVERNMENT,
 RHODE ISLAND, 1965, 1970 AND 1975.

Year and Level	Regression Equation	Average Rate of Change ¹		
		L	Mean	U
<u>1965</u>				
All Levels	50.07	48.60	49.78	50.96
Federal	15.23	14.13	15.28	16.43
State	12.86	12.26	12.85	13.44
Local	21.95	21.21	21.69	22.17
<u>1970</u>				
All Levels	52.36	51.74	52.92	54.10
Federal	15.38	14.30	15.45	16.60
State	14.29	13.60	14.19	14.78
Local	23.66	22.78	23.26	23.74
<u>1975</u>				
All Levels	56.65	54.88	56.06	57.24
Federal	15.54	14.48	15.63	16.78
State	15.71	14.99	15.58	16.17
Local	25.36	24.36	24.84	25.32

NOTE: (1) L = Mean - Standard Deviation
 U = Mean + Standard Deviation

TABLE XXVII
PROJECTIONS OF GOVERNMENT EMPLOYMENT PER
1,000 POPULATION, PSMA,
1965, 1970 AND 1975.

Year	Regression Equation	Average Rate of Change ¹		
		L	Mean	U
1965	43.83	43.53	44.21	44.89
1970	46.47	46.37	47.05	47.73
1975	49.12	49.22	49.90	50.58

NOTE: (1) L = Mean - Standard Deviation
U = Mean + Standard Deviation

were accordingly estimated from the projections developed for Rhode Island. In each category it was assumed that historically stable ratios of employment in Providence to employment in Rhode Island would remain constant. In the case of federal employment, the assumed ratio was 0.251 and for state employment, 0.324.

Employment for the City of Providence can be estimated on the same basis as that used for the State and PSMA. The projected ratios of local employment and population are summarized in Table XXVIII.

TABLE XXVIII
PROJECTIONS OF LOCAL GOVERNMENT EMPLOYMENT PER
1,000 POPULATION, PROVIDENCE, 1965, 1970 AND 1975

Year	Regression Equation	Average Rate of Change ¹		
		L	Mean	U
1965	27.51	27.25	27.67	28.09
1970	30.08	29.89	30.31	30.73
1975	32.65	32.53	32.95	33.37

NOTE: (1) L = Mean - Standard Deviation
U = Mean + Standard Deviation

2. The Employment Estimates, 1965, 1970 and 1975

The projections of government employment are made by applying the projected employment per 1,000 population to the relevant population estimates. The results of these conversions are summarized in Tables XXIX - XXXI.

TABLE XXIX

PROJECTIONS OF GOVERNMENT EMPLOYMENT FOR ALL
LEVELS OF GOVERNMENT, RHODE ISLAND,
1965, 1970 AND 1975.

(Thousands)

Year and Level	Regression Equation	Average Rate of Change ¹		
		L	Mean	U
<u>1965</u>				
All Levels	44.5	43.2	44.3	45.4
Federal	13.6	12.5	13.6	14.6
State	11.4	10.9	11.4	11.9
Local	19.5	18.9	19.3	19.8
<u>1970</u>				
All Levels	49.7	48.1	49.3	50.4
Federal	14.3	13.3	14.4	15.4
State	13.3	12.7	13.2	13.8
Local	22.0	21.2	21.6	22.1
<u>1975</u>				
All Levels	53.5	51.9	53.0	54.0
Federal	14.7	13.7	14.8	15.9
State	14.8	14.2	14.7	15.3
Local	24.0	23.0	23.5	23.9

NOTE: (1) L = Mean - Standard Deviation
U = Mean + Standard Deviation

TABLE XXX
PROJECTIONS OF GOVERNMENT EMPLOYMENT,
PSMA, 1965, 1970 AND 1975.

(Thousands)

Year and Level	Regression Equation	Average Rate of Change ¹		
		L	Mean	U
<u>All Levels</u>				
1965	37.0	36.7	37.3	37.9
1970	40.5	40.5	41.0	41.6
1975	44.2	44.3	44.9	45.5

NOTE: (1) L = Mean - Standard Deviation
U = Mean + Standard Deviation

TABLE XXXI
 PROJECTIONS OF GOVERNMENT EMPLOYMENT FOR ALL LEVELS OF
 GOVERNMENT, PROVIDENCE, 1965, 1970 AND 1975.

(Thousands)

Year and Level	Regression Equation	Average Rate of Change ¹		
		L	Mean	U
<u>1965</u>				
All Levels	12.3	11.8	12.3	12.8
Federal	3.4	3.1	3.4	3.7
State	13.7	3.5	3.7	3.8
Local	5.2	5.2	5.2	5.3
<u>1970</u>				
All Levels	13.1	12.6	13.1	13.7
Federal	3.6	3.3	3.6	3.9
State	4.3	4.1	4.3	4.5
Local	5.2	5.2	5.2	5.3
<u>1975</u>				
All Levels	13.7	13.1	13.7	14.3
Federal	3.7	3.4	3.7	4.0
State	4.8	4.6	4.8	5.0
Local	5.2	5.1	5.2	5.3

NOTE: (1) L = Mean - Standard Deviation
 U = Mean + Standard Deviation
 L and U for all levels is a simple sum of limits.

PART III: THE REVENUE CAPACITY OF THE CITY OF PROVIDENCE

Any study designed "to determine the emerging revenue capacity of the City of Providence and to evaluate the effect of such capacity over time in the City's capacity for redevelopment action" involves numerous complicating factors. The very concept of fiscal capability is a fuzzy one -- resting on both the income of the region and tax structure. Even were the revenue potential known, the availability of funds for urban renewal would inevitably be affected by the urgency of other demands upon the City's finances. With so many important variables affecting the City's financial capacity to support urban renewal it was decided not to attempt to arrive at a single figure for the tax rate, debt, or support for urban renewal in 1970. Any such estimate would have to be based on a combination of assumptions about the tax base, operating costs, and capital expenditure programs. Instead, this report presents a number of projections indicating how the City's finances might look according to whichever assumed policies were to be followed. It is not easy to say what path of action will be followed. Nevertheless, this report should aid in pointing out some of the fiscal milestones likely to be encountered along the more probable courses of action that the City might follow.

The many factors influencing the City's financial structure have been placed into three main categories. First, the City's tax base and revenue potential is considered; second, the trend of the City's operating expense is examined; the third, the costs of alternative capital spending programs are considered. All these elements combine to determine financial capacity.

A. Revenue

An examination of the recent financial record of the City will indicate clearly the very heavy reliance upon property tax. As can be seen from Table XXXII, since 1953 the property tax has provided

a growing fraction of the City's operating expenses. The present figure of roughly 80 per cent of the operating budget shows Providence to be unusually dependent upon this tax.

Even if the tax is well-administered and the assessment equitable, the property tax has serious limitations as a revenue source. The tax is a very inelastic source of revenue. As incomes (and municipal expenditures) rise, the property tax does not automatically provide additional revenues. Unless a municipality is fortunate in having considerable additions to its tax base, a period of rising costs has to be met by higher tax rates. Higher rates, in turn, provide more revenue but compound the problem by reducing the attractiveness of the City as a location for new construction. Part of the decentralization occurring within the Providence metropolitan area can be attributed to this cause.

The value of taxable property has not increased significantly in the last decade. As can be seen in Table XXXIII, the tax rate has increased nearly \$10 per \$1,000 in the last ten years while the value of taxable property has risen by roughly \$120 millions. Actually, however, the effective tax rate has increased by more than the \$10 shown. This is because much of the increase in the value of taxable property has resulted from revaluations rather than actual increments of taxable property. Three major changes occurred in valuations. In 1956, the value of the assessments on land was increased by \$30,000,000; in 1961, the revaluation and equalization increased the assessed value of "buildings and improvements" by roughly \$78,000,000, and in 1962, the value of intangible property was increased by \$300,000,000. Approximately \$50,000,000 resulted from a court decision determining the taxability of commercial bank deposits. The tax rate on intangibles has remained at the \$4 per thousand rate. These three actions increased the assessed values of property in the City; but are in reality only changes in the effective tax rate.

TABLE XXXIII

ASSESSED VALUES AND TAX RATES 1950-1962

(in 000's)

Year	Land	Buildings and Other Improvements	Tangible Personal Property	Total "Real" Property	Tax Rate Per 1,000	Intangible Personal Property	Tax Rate Per 1,000
1950	129,766	322,670	138,830	591,266	\$28.00	211,067	\$4.00
1951	130,226	326,405	146,394	603,026	29.40	229,299	4.00
1952	130,563	332,743	154,135	617,441	29.40	235,170	4.00
1953	131,157	337,813	156,070	625,040	31.00	230,833	4.00
1954	131,170	343,967	155,826	630,962	31.00	218,931	4.00
1955	130,393	352,468	151,044	633,905	33.00	229,282	4.00
1956	160,257	355,905	153,509	669,691	33.00	256,979	4.00
1957	159,947	360,028	152,561	627,535	35.50	257,583	4.00
1958	159,173	361,952	153,809	674,933	35.50	245,613	4.00
1959	157,934	362,221	150,581	670,737	39.00	272,298	4.00
1960	156,297	361,204	152,731	670,231	39.00	275,922	4.00
1961	152,812	439,160	153,709	745,680	39.00	254,364	4.00
1962	153,140	434,495	158,105	745,740	39.00	311,523	4.00

By examining the valuations of land, buildings, and other tangible properties, we can see clearly the impact of revaluations and the very slight increases in the real property base for the City's tax revenues. From 1952 to 1961, the assessed values on real property increased from \$617 million to \$745 million. Of this increase, however, roughly \$108 million is explained by revaluations and only \$20 million by real increases in property values. This is an increase of only 3 per cent in a ten-year period.¹

During this same period, City receipts from other revenue sources have increased little. "State-grants" and "other revenue sources" now generate more dollars than in 1952 but provide a smaller percentage of the City's rising revenue needs. The existing revenue sources of the City, and the pattern of state grants do not provide any significant automatic increase in funds.

Given this record of tax receipts, what can reasonably be expected in the future? Considering the property tax base alone, the picture is mixed. For example, Table XXXIII shows there has been a virtually constant tax base since 1952. However, there has been considerable construction and demolition during this period. An analysis of building permits by the W. H. Ballard Co. shows that from 1950-1961, the City has averaged about \$4,000,000 of new construction and improvements of taxable property and an additional \$2.9 million additional of non-taxable property.² With the virtually constant

1. The increase in valuations, \$108,000,000, was "worth \$4,212,000 in property tax receipts according to the 1962 tax rate of \$39 per thousand. If these revaluations had not been made, the tax rate would have to have been roughly \$6 higher, or \$45 per thousand. Thus one effect of the revaluation has been to mask part of the increase in the effective tax rate.

On the other hand, the effect of real increases in the tax base have so far been very slight. If the increases in real property values are excluded and the effect of revaluations are included, the tax rate would have to rise only to \$40. Thus the values of the real tax base in Providence has risen only by the equivalent of \$1 on the tax rate in ten years.

2. See Table XXXIV.

TABLE XXIV
BUILDING PERMIT VALUE ANALYSIS - PROVIDENCE

Classification	1950-1961 Total \$ (000)	Per Cent	1950-1961 Annual Rate \$ (000)	Indicated Bldg. Area (Acres)	Indicated Land Area (Acres)
<u>Industrial Land Use</u>				1.8	6.1
Manufacturing	5,328		444	40,000	
Warehouses	<u>3,778</u>		<u>315</u>	<u>40,000</u>	
Total	9,106	11	759	80,000	
<u>Commercial Land Use</u>				1.20	2.9
Gas Station	992		83	8,000	
Stores	2,765		230	14,000	
Office Bldg.	5,493		458	18,000	
Amusement	<u>1,928</u>		<u>161</u>	<u>10,000</u>	
Total	11,178	13	931	50,000	
<u>Public Land Use</u>				3.0	1.5
Schools	21,761		1,813	72,000	
Municipal	5,121		426	21,000	
Churches	<u>8,750</u>		<u>729</u>	<u>37,000</u>	
Total	35,632	43	2,968	120,000	
<u>Residential Land Use</u>				200 D.U.	20
Private Residential	22,842		1,903	201 D.U.*	
Garages	<u>4,272</u>		<u>356</u>		
Total	27,114	33	2,259		
<u>Other</u>	701		58		
<u>Total</u>	83,731	100	6,977		

* Public Housing approximated an additional 170 dwelling units per year.

total values of assessable property, it follows that demolition and condemnations must have been roughly parallel. It is, however, not possible to get from assessors' records a year-by-year breakdown of additions to and removal from the tax rolls.¹ This, of course, makes it difficult to determine the trend in construction of new taxable property. Such a trend, compared with projected property condemnations and the trend of "normal" demolitions, would have been helpful in estimating the future value of real property.

There are some factors that are likely to have an adverse impact on the tax base, at least in the immediate future. Property condemnations for Routes 95 and 6 total \$6,470,910, as of November, 1961. An additional \$6,346,820 of property is scheduled for early condemnation for these routes. With this amount, added to condemnations for future Redevelopment projects and parts of the Downtown Master Plan, it is clear that there will be a considerable gross removal of taxable properties. There is yet another important and adverse factor. The central business district has not been as profitable a business location in recent years. As the value of a location declines, ultimately the price of the leases and the value of the land and buildings must decline also. There are indications that this process is underway in Providence. If it continues, and as properties are sold for prices below their assessed values, there will have to be a continuing writing down of the assessed values in the central business district. Inasmuch as the central business district represents a large share, roughly 15 per cent, of the assessable property in the City, any sizeable declines in property values here would have a severe impact on the City's tax base. For example, a possible decline of 10 per cent in the value of the

1. 1961 is an exception to this rule. During 1961, the Assessors' Office made a check of the value of additions to and removals from the tax rolls. During calendar 1961, nearly \$7 million of property was removed from the tax rolls because of highway construction, redevelopment, and "normal" demolition of buildings. In the same year, new construction of taxable property added \$3.7 million.

central business district would cost the City nearly \$450,000 of tax revenue.

There has been more residential construction in Providence. Lack of good sites, however, seriously limits this activity as a significant source of additional taxable property. Redevelopment projects can create sites suitable for housing, but in view of the high cost per acre in obtaining this land, it is questionable whether private residential use would be the most productive use of the land in terms of either tax revenues or the economic base of the City.

The question of the productivity of municipal investment is a central one in allocating the City's scarce investment capital. Of the redevelopment projects completed to date, the re-use patterns have generally made it difficult to get a reasonable basis of comparing the "before and after" pictures of the project areas. The nearly complete West River Industrial Redevelopment project is an exception. In West River, 50.8 of 59.6 total acres have been redeveloped for industrial use. Before redevelopment, the assessed value of the whole area totalled \$1,252,825, yielding (at the \$39 rate) a tax of \$48,860. After the redevelopment action, the property is assessed at \$4,584,440, yielding a tax of \$178,793.¹ Thus, West River, after redevelopment is yielding \$130,000 more in taxes. However, this gain cost a total of \$4.1 million, of which the City's share was \$1.4 million. Comparing the 20-year estimated amortization costs, \$1,890,000 (at 3 1/2 per cent, 20-year bonds), with the estimated tax gain (\$2.6 million) shows a net gain. If the value of investment increases by more construction, so will the gain. In addition, no estimate is made of the differences in the before and after impact of the area upon the operating budget. However, unless the West River project caused other large capital and operating outlays by the City, it is evident from the City's viewpoint that it is a profitable investment.

1. This "after" assessed value figure is the result of taking 80 per cent of \$5,730,550, the estimated market value of the taxable property in West River. There is additional property in West River, but it is nontaxable.

However, the yield on this investment is far from spectacular. The average assessed value of the taxable property -- including land and buildings -- increased from roughly \$19,000 per acre to about \$90,000 per acre.¹ This gain of about \$70,000 per acre in the tax base is helpful, but not of very great magnitude in relation to the overall picture of Providence's finances. If it is assumed that the gain shown in this industrial redevelopment project is typical, it is clear that improvements within the redevelopment project area alone cannot provide a solution to municipal financial problems. For example, if 500 acres (far more than now planned for industrial redevelopment) were developed on a basis similar to West River, the City's tax base would increase by roughly \$35,000,000. At the current tax rate this gain would provide an additional tax yield of \$1,365,000 -- an amount equal to about \$2 on the tax rate with the existing tax base. When we consider that in the first years of such a program that debt service costs would be high, it is not likely that the net gain would be more than the equivalent of 50 cents on the tax rate.

There are some obvious limitations to this analysis. It may be that other project areas will have higher net tax productivity. The cost to the City for providing services to the project area -- police and fire, in particular -- may be reduced. The effect of an industrial redevelopment project may spill over into surrounding properties in a reverse of the rotten apple in the barrel analogy. None of these are major arguments, however. If the estimates given are correct -- or even if they are grossly optimistic -- the case for urban redevelopment is not demolished. What is accomplished is to show that urban redevelopment is not a cure for the City's problems. Improving the City's immediate revenue prospects is not the sole

1. Before redevelopment, the 59.6 acres were assessed for a total of \$1,252,825. Of this, \$1,130,723 represented taxable property. After redevelopment, the 50.8 acres devoted to industrial use were assessed for \$4,584,440. This is an increase in the average assessed value per acre from \$18,972 to \$90,244.

consideration. Of greater importance is the improvement of the City's income and employment base. If industrial redevelopment contributes significantly to this goal, it is performing an important function and deserves high priority in the allocation of municipal funds even though the direct effect upon tax revenues may not be favorable.

The fact that the revenue estimates needed are for the City of Providence adds an additional complication. We have estimates of changes in manufacturing employment on an industry-by-industry basis. By examining the relationship between employment and investment in these industries, it would be possible to make crude estimates of the change in the total tax base. Unfortunately, however, even if we could assume a high degree of accuracy in the employment estimates there would be great uncertainty in the measurement of the impact of employment on assessed values. The only fairly certain proposition is that if Providence is to have a chance to share in projected economic development, it must have available sites suitable for modern industrial operations.

Considering the past record of the changes in the value of property in Providence and the mixed impact of existing tendencies, considerable optimism would be required to project any significant increase in the tax base by 1970. The City will not have done badly -- in view of existing pressures -- if by 1970, the value of taxable property does not decline.

The other elements in the revenue picture are less predictable. The miscellaneous fees, licenses, and charges levied by the City do not provide any significant amount of revenue, and it is highly questionable whether they should be relied upon to a great extent. The role of increased state grants, the passage of an income tax, or increased sales tax rates could all make a significant contribution to the City's revenues. However, these actions rest upon policy shifts that are beyond the control of the City. Certainly it would be difficult to predict with any degree of accuracy the

probable impact of a hypothetical tax policy. There are estimates, however, of the value of some proposed changes in tax policy.

For example, if Providence were to enact (or receive from the state) a 1 per cent income tax, it would provide roughly \$4.5 million.¹ This additional revenue would be equivalent to the yield of \$6 per thousand on the tax rate with assessed values at the \$750,000,000 level. An additional advantage to the City would be in having a tax source automatically producing more revenue as incomes rise.

Similar estimates have been made of the value of changes in the sales tax. Assuming an addition to the state tax distributed to the cities and towns (so designed to avoid the biasing effect of a local sales tax) of 1 per cent, Providence would have received \$4.3 million in 1961. This would be worth about \$5.75 per \$1,000 in the tax rate. If the growth in the state tax collections were maintained (about \$500,000 per year) an additional 1 per cent would be worth about \$6.7 million or \$8.90 on the tax rate by 1970.

In estimating the financial capacity of the City, the following assumptions were used regarding the revenue base. The value of real property in 1970 was assumed to be \$750,000,000, remaining roughly equal to the current figure. In addition, the value of intangibles was assumed to remain at \$300,000,000 with the tax rate holding at the \$4 figures. In arriving at estimated tax rates, it was further assumed that the operating budget would remain in balance and the property tax would continue to meet 80 per cent of the City's operating expenses. The actual estimates of tax rates, debt, etc., in turn rest upon the above estimates plus the projections of

1. The estimate was obtained by projecting a figure for personal incomes in Rhode Island in 1970. Since figures are not available for personal income in Providence, Providence was assigned a share of statewide personal income equivalent to the percentage Providence represents of Rhode Island income. No adjustment was made for the possible effect of such tax upon choice of domicile.

operating expenditures and capital outlay discussed below.

B. Operating Expenses

Any accurate estimate of Providence's financial picture in 1970 would require as a prerequisite an accurate appraisal of the course of the General Fund expenditures. The reason for this is based on the financial practice of the City. The operating expenses of the City (including debt service) are met by tax revenues. Of these tax revenues, the property tax provides roughly 80 per cent of the total. The level of the property tax rate is a major factor in the City's financial structure, its competitive position in the location of economic activity, and in the willingness of the voters of the City to carry out expensive long-term programs. However, with most urban renewal and other durable projects-- school buildings, highways, and sewers for example --financed as "capital" projects, the effect on the tax rate and City's financial ability is delayed and somewhat hidden.¹ Table XXXV presents the record of operating expenditures in Providence for the period 1950-1962.

1. For most purposes, "capital" projects are defined as those financed with bond funds. Some few capital projects -- capital defined as durable, lasting projects -- are financed from current receipts. There is little likelihood of any significant amount of capital (long-lasting improvements) projects being financed from current receipts in the near future. To do so requires a higher tax rate at once than would be required if bonds were issued. It is true that pay-as-you-go does cost less over time, but immediate effect of the higher tax rate has a clearly undesired political impact. In addition, if the City's tax competition status is shaky, it may be appropriate on economic grounds to use debt finance now.

An additional argument often used in favor of debt finance is the intergeneration equity principle. This notion-- that pay-as-you-use is more fair-- is subject to limitations, although it is widely cited by municipal officials. Just because a project creates an asset that will last for twenty years does not require on equity grounds that it be paid for over a corresponding period. For example, if each year \$3,000,000 of public improvements were to be added-- each with the same expected length of usefulness --financing on a current revenue basis would not violate the intergeneration equity principle. As far as equity considerations are concerned-- and they obviously are not the only considerations -- many projects now financed by borrowing could logically be financed from current tax revenues.

TABLE XXXV

OPERATING EXPENDITURES

City of Providence
1950-1963

(In Thousands to nearest 1,000)

Year	Miscellaneous	Debt Service	Pensions	Contributions	Public Schools	Parks and Recreation	Public Welfare	Public Health	Public Works	Public Safety	General Gov't.	Total
1950	\$ 125	\$ 3,396	\$ 1,121	\$ 299	\$ 6,237	\$ 531	\$ 3,517	\$ 944	\$ 3,500	\$ 3,756	\$ 950	\$ 24,376
1951	190	3,569	1,150	305	6,277	538	2,522	966	3,605	3,742	945	23,809
1952	447	3,652	1,291	328	6,596	662	2,393	1,200	3,621	4,143	1,138	25,471
1953	207	3,538	1,471	333	7,239	633	2,055	1,271	3,762	4,152	1,071	25,731
1954	761	3,471	1,563	362	7,363	692	1,954	1,367	3,973	4,546	1,163	27,215
1955	305	3,512	1,479	421	7,917	697	2,203	1,493	3,857	4,692	1,220	27,796
1956	293	3,592	1,526	438	8,660	763	2,229	1,560	4,355	4,899	1,294	29,609
1957	460	3,684	1,591	522	8,921	1,121	2,323	1,493	4,102	5,130	1,288	30,635
1958	461	3,880	1,592	513	9,791	896	2,493	1,614	4,401	6,016	1,417	33,074
1959	611	4,232	1,618	521	10,489	838	2,649	1,640	4,334	6,021	1,374	34,327
1960	767	4,045	1,728	535	10,908	916	2,351	1,777	4,743	6,506	1,510	35,786
1961	832	4,189	1,950	544	11,412	956	2,216	1,814	4,709	6,546	1,501	36,668
1962	1,387	3,991	1,949	560	12,325	1,033	1,667	1,855	5,163	7,058	1,704	38,692
1963*	1,024	4,823	2,166	595	12,206	1,179	1,930	1,925	5,376	7,273	1,733	40,230

*Estimated.

SOURCE: Annual Financial Reports of the City of Providence.

Providence City Plan Commission, Capital Improvement Program: 1963-1969.

NOTES: (1) These figures are exclusive of the Water Supply Board.

(2) The totals in each category are based on general fund expenditures except for the Public Schools account. The total expenditure for public schools is listed separately under the School Fund and includes expenditures additional to those made from the general fund.

(3) The Parks and Recreation category includes the expenditures for "Celebrations" listed separately in the Controller's Report.

(4) "General Government" expenditure is obtained by adding the totals for financial and for general administration.

(5) As of 1952, the Fire Insurance Fund was added to the Miscellaneous category.

(6) Beginning in 1952 the expenditures for Public Bath Houses and Public Comfort Stations are included under Public Health rather than under Public Works.

(7) The sum of the subtotals may not always equal the total column because the numbers have been rounded off to the nearest thousand.

Obviously, a large bond sale to finance an urban renewal program affects the City's finances. But, if the bond rating is satisfactory, if the City can still borrow at a "reasonable" interest rate, if there is no restraint from a debt limit, and if the voters continue to approve referenda authorizing bond sales, there is no immediate sharp jolt to the taxpayers. For example, the 1961 operating budget, exclusive of the Water Supply Board, totalled roughly \$34 million, of which \$4,188,581, was for debt service. If the City were to have issued an additional \$25,000,000 in twenty-year serial bonds in the previous year, 1960, thereby adding nearly 50 per cent to the debt, the debt service account would have risen by \$2 million to roughly a total of \$6.2 million.¹

This would have required the tax rate to have risen from the present \$39 per thousand to about \$41.70, a modest increase in view of the great amount of immediate spending achieved. In fact, if the five-year deferral of principal bonds were used, the debt service would have increased by only \$750,000 for the first five years of the issue. In this instance, the immediate impact on the tax rate would be a very modest increase from \$39.00 to \$40.06.

Total operating expenses, excluding the Water Supply Board and Debt Service, are projected to increase from slightly less than \$30 million in 1961 to \$40.2 million by 1970. This projection is based on current price levels. If an inflation estimate is added, the 1970 figure would become \$41.6 million. The WSB is excluded, since it is a virtually autonomous self-financing agency. Debt service is left out because it is projected (in the next section) according to a variety of possible capital outlays. The first step in estimating operating expenses in 1970 was to examine the trend of expenditures since 1955. This was done for total operating expenditures and subsequently on a department-by-department basis.²

1. This assumes an interest rate of 3 per cent on the hypothetical new issue.

2. Debt service was not projected but is estimated in the next section, according to various proposed "capital outlay programs."

While simple extrapolation of a trend may yield reasonably accurate results, it is dangerous merely "to continue a trend" as a basis for prediction. Therefore, in order to get a better indication of the probable future status of the operating expenditure budget, the expenditure patterns of the various major departments were analyzed.

Table XXXVI shows the trend of expenditures on a department basis.

A thorough investigation of the planned activities, the wage scales, and other related factors affecting the operating expenditures of individual departments would be very useful but is a large and complex undertaking. Even a very cursory investigation of the major departments, however, yields helpful information in estimating the future trend of expenditures. In looking at the trends in department expenses -- and especially what has gone into increased outlays -- certain conclusions are apparent.

In virtually all expenditure categories, the deviation of past expenditures from the trend lines has not been great. In other words, the pattern of increased departmental expenditures has been reasonably smooth, although there have been differences in the rate of increase among the department over the years. Further, the importance of increased salaries upon total expenditures is considerable.

In educational expenditures, for example, the total outlay between 1955 and 1961 has increased from \$7,916,658 to \$11,411,959.¹ Of this total increase of \$3,495,301, instructional salaries have gone up by nearly \$2 million and salaries for custodial services by another \$300,000. Because of the large impact educational expenditures have upon the total operating budget, the future trend in educational expenses is important.

There are some indications that the school operating budget may not rise as rapidly in the future. The "Report of the Mayor's

1. These figures exceed by roughly \$3 million the City's outlay from the general fund for educational operating costs. The difference is explained by miscellaneous receipts of \$422,809 and state aid of \$2,580,545 in 1961.

TABLE XXXVI
GENERAL FUND EXPENDITURES 1961 AND 1970
(Thousands)

Department	1961	1970	% Change
Legislative, Judicial and General Administration	718	873	21.6
Financial Administration	783	1,083	38.3
Public Safety	6,546	9,830	50.2
Public Works	4,709	5,884	25.0
Health	1,815	1,978	9.0
Welfare	2,216	2,613	17.9
Recreation	929	1,193	28.5
Education	8,782	11,908	35.6
Grants	544	760	39.7
Pensions	1,950	2,430	24.6
Miscellaneous	832	1,680	102.0
Total (inclusive WSB and debt service)	29,849	40,249	34.84

Committee on Municipal Revenue" outlines a number of favorable factors.¹ For example, the salary scale in Providence is low for cities of comparable size. Yet, the salary cost per pupil is about average. This seeming inconsistency-- explained by the large percentage of teachers with long service placing them at the top of the salary bracket-- may moderate the effect of any future salary scale increases upon total salary costs. With a declining school population, Providence should not have to replace as many teachers as should be retired. However, if the City has to continue to raise salaries to remain competitive, with the proportion of low seniority teachers increasing, the average salary cost per teacher should not rise as rapidly as the scale.² Table XXXVII below illustrates the currently high fraction of teachers in the Providence schools with lengthy service.

TABLE XXXVII
LENGTH OF SERVICE OF TEACHERS
IN THE PROVIDENCE SCHOOL SYSTEM, 1960

	Senior High	Junior High	Elementary
Total	308	284	520
10 years	199	172	337
20 years	182	146	261

The program of school construction and modernization is another potentially favorable factor. In the past Providence has spent a disproportionately large amount upon operation and maintenance. Newer buildings and a consolidation of classes with the closing of some underutilized buildings could result in

1. "Report of the Mayor's Committee on Municipal Revenue," Providence, Rhode Island, 1959, pp. 90-97.

2. It is implicit in this argument, however, that most new teachers coming into the Providence system would have had little service in other systems.

considerable economies.¹ However, as was stated in the "Report of the Mayor's Committee," "The solution to the problem of high costs of operation appears to lie in modernization and consolidation. The Providence School Department has a program in operation, but it faces severe social pressures in carrying it out."²

The issue of teaching load is also a relevant one. With a declining school population, it is clear that if the instructional staff remains at the same size, instructional costs per pupil will go up. The importance of the teaching load in the budget can be seen from Tables XXXVIII and XXXIX below. With a predicted decline of roughly 20 per cent in both the number of students and teachers, the saving in instructional costs salary levels would amount to over \$1,300,000 per year.³

In summary, the expenses on education will probably increase by 1970, but, if a careful control is kept, need not rise as rapidly as previously. The straight-line projection estimate for this department -- from \$8.8 million to nearly \$12 million is probably too pessimistic by perhaps as much as \$1,000,000.⁴

1. Additional debt service charges for new school buildings is not charged to the educational budget but included with other debt service.

2. Report, op. cit., p. 106.

3. It is not probable that the loss in the number of students should be matched by equal losses in the number of teachers; but if consolidations are not pushed, a declining school population can result in a costly decline in student-teacher ratio. The figure cited above was calculated as follows: The estimated net reduction in the number of teachers in each of three categories was multiplied by the 1960 average salary.

Elementary:	69	X	\$5,778	=	\$ 398,682
Junior High:	95	X	\$5,658		537,510
Senior High:	80	X	\$5,358		428,640
					<hr/>
					\$ 1,364,832

4. These figures, \$8.8 million and \$12 million, are not the total school expenses but rather only those expenses that must come from the City's general fund.

TABLE XXXVIII
SCHOOL POPULATION ESTIMATE

	1960 Actual	1970 ¹ Est.
Elementary School	13,386	11,617
Junior High	5,913	3,941
Senior High	5,247	3,887
² Total	24,546	19,445

(1) Estimate based on "a projection of enrollment since 1945".

(2) Kindergarten omitted.

TABLE XXXIX
NUMBER OF TEACHERS--PROVIDENCE SCHOOL SYSTEM

	1960 Actual	1970 ¹	Net Reduction
Elementary School	520	451	69
Junior High	284	189	95
High School	308	228	80
Total	1,112	868	244

(1) The "reduction" in the number of teachers is based on the assumption that the teacher/student ratio remains constant.

Expenditures in other departments reflect the major importance of the salary scale in the trend of operating costs. The Public Safety expenditures rose from \$4.7 million in 1954 to \$6.0 million in 1958. Of this total, nearly 90 per cent represented increased expenditures on personal services. Although Police and Fire Department salary scales have been increased, Providence still has a relatively low scale.¹ Since these departments are already operated with a good degree of efficiency, as Providence is subjected to demands for salary increases to keep up with other cities in the region, it is likely that the upward trend in operating expenses will continue.

The upward trend in operating expenses by the Public Works Department has been slower and less smooth. The effect of salary increases has been less pronounced in the rising costs of this Department, partly because of the smaller weight of salary costs. Most durable projects carried out by the City are accomplished with borrowed funds and hence would not appear directly in a Department's operating budget. In the case of Public Works, some projects are financed by current revenue. The amount of such financing is largely a result of how much of the general fund receipts are left after meeting other operating expenditures. Because of this peculiarity in the record keeping, the inclusion of non-operating expenses within the general fund operating budget, the Public Works Department expenditures appear to fluctuate more than they do in fact. It is not likely that current revenue financing of "capital" projects will play a larger role in the near future. The upward trend in other expenditures have varied mainly with the outlay on personal services. The expenditures on Welfare are more variable, being influenced primarily by the variation in payments for General Public Assistance. Pension expenditures are likely to continue upward as the City increases its payments to the Employee's Retirement System and the OASI.

1. "Report of the Mayor's Committee on Municipal Revenue," pp. 106-107.

In summary, a very considerable study beyond the scope of this project would be required to make a thorough evaluation of the trend in operating expenses department-by-department. However, it has been possible to determine the past trend of expenses and project this trend to 1970. Examining the record and prospects of most departments, it appears that those pressures explaining past increases still exist. If municipal salary scales throughout the New England region were to be stabilized, part of the pressure for salary increases would be lost. This, however, is most unlikely to occur. In addition, in spite of a low-wage scale in much private employment in Providence, municipal employees may feel justified in trying to catch up with the average of comparable cities. Only in the case of education, an important exception, do there appear to be important possibilities of significantly slowing the upward trend in operating expenditures.

Because of the difficulty in accurately predicting changes in the operating budget and because of the importance of slowing the impact of alternative capital improvement programs, three alternative estimates are prepared. The high, medium, and low operating estimates and revenue estimates can be coupled with a variety of possible capital programs and yield figures for debt and tax rate in 1970.

The high estimate, based on a continuing of the past trend of operating expenses, is for an increase from \$29,849,520 to \$40,249,000. The second projection assumes an increase at half the past rate with operating expenses rising to \$35,050,000 and the third and lowest estimate assumes operating expenses remain constant. In view of the evidence, however, even the "high" estimate is fairly cautious. If the actual figure is one or two million below the high estimate the City will have done well.

C. Capital Expenditures

The third element required in estimating Providence's financial position in 1970 is an evaluation of capital outlays. As has been

discussed previously, the operating budget has the most immediate impact on the City's finances. However, a capital expenditure program is soon reflected into the operating budget via the debt service account. In addition, the ability of a city to borrow for long-term improvements is limited by factors other than the impact on the tax rate. There are also the need for voter approval, the legal debt limit imposed by the state limiting municipal borrowing, and the impact of truly large scale borrowing upon the City's credit rating and ability to borrow at reasonable interest rates.

Of the major items involved in forecasting the City's financial capacity by 1970, capital expenditures are most likely to be altered greatly as a result of recurring policy shifts. Inasmuch as a central purpose of this study is to determine the City's ability to carry out urban renewal, it was decided to show the contrasting impact on the City's finances of alternative capital improvement programs. Three main alternatives were examined: first, the effect of carrying out the 1961-1967 Capital Improvement Program; second, the effect of a program restricted to the average of recent capital spending exclusive of urban redevelopment spending; and third, the spending in the second estimate plus all projected redevelopment expenditure and other City expenditures in connection with the Downtown Master Plan. In addition, the effects of using five-year deferral of principal bonds vs. a standard twenty-year serial bond were calculated for each of these spending programs.

Table XL presents six alternative net debt figures based on the capital spending programs and type of bond. Some explanation is required of the procedures used in arriving at these figures for net debt. Estimate A is based on the 1961-1967 Capital Improvement Program with no use for "deferral bonds." Since the estimate was desired for 1970 and the CIP runs only through 1967, an additional assumption was required. During the period 1961-1967 the average planned capital outlay is about \$6.5 million. Similar outlays were projected for 1968-1970. Estimate B is identical to A except the

TABLE XL
ESTIMATES OF CHANGES IN NET DEBT 1962-1970.

Year	A Net Debt Exclusive WSB (in 000)	B	C	D	E	F
1962	52,907	52,907	52,907	52,907	52,907	52,907
1963	52,469	52,469	53,183	53,183	56,183	56,183
1964	52,632	53,144	52,933	53,502	58,827	59,502
1965	58,906	60,123	52,372	53,641	60,966	62,641
1966	61,860	64,299	52,323	54,467	63,467	66,467
1967	62,939	66,942	52,086	55,280	65,630	70,280
1968	64,900	70,734	51,653	56,072	67,447	74,072
1969	66,522	73,999	51,030	56,324	68,924	77,174
1970	67,801	77,054	50,215	56,384	70,059	79,934

C-F, assume \$7 million of notes payable outstanding are funded in 1963 plus \$3.5 "new projects" issued.

In E and F, \$24 million (roughly) are scheduled for renewal expenditure 1963-1970. It is assumed these expenditures are made in uniform annual amounts (2.8 million) and are added to existing debt services and projected capital outlays for other purposes.

use of five-year deferral of principal bonds is assumed for all future issues. Estimate C is based on an average of prior capital expenditures exclusive of redevelopment. Estimate D is similar to C, but again, the use of five-year deferrals is assumed for all new bond issues.

There were two objectives in setting up C and D as outlined. First, each capital budget submitted and approved has shown a relatively large amount scheduled to be spent each year at the start of the six-year program with smaller amounts in the later years. There are several reasons for this, one of them undoubtedly the inability of some departments to plan necessary capital outlays very far into the future. In reality however, capital expenditures have not shown any tendency to be decreasing. (See Table XLI for a record of capital expenditures since 1952.) The second objective was to separate redevelopment outlays from other capital spending in order to have a more clear picture of the impact redevelopment spending has had and can be expected to have in the future. For example, in the seven years since the first bonds were issued for redevelopment, 1955-1961, the total capital expenditures (exclusive of the Water Supply Board) amounted to roughly \$37 million. Of this total, somewhat over \$12 million was for redevelopment, mostly being spent in 1961. Thus, during the seven-year period 1955-1961 the average capital outlay was roughly \$5.3 million compared with a planned \$6.5 in the period 1962-1970. If the redevelopment spending were omitted, the average annual spending during 1955-1961 would have been \$3.5 million instead of \$5.3 million. Estimates C and D should not be viewed as predictions but rather as a basis for showing the impact of redevelopment spending on top of other probable capital outlays.

Estimates E and F are based on C and D plus projected outlays by the City for urban renewal and other spending in connection with the Downtown Master Plan. During the period 1962-1970 the City's

TABLE XLI

EXPENDITURE OF CAPITAL FUNDS

(Based on Schedule E 1 of the Annual Financial Reports of the City of Providence. W.S.B. is excluded)

(In Thousands)

Purpose	1952	1953	"Other" under Public Works includes docks, incinerator, garages, traffic installations		
			1954	1955	1956
Fire Department	\$ 169,233.88	\$ 84,826.75	\$ —	\$ 479.80	\$ 56.47
Public Works					
Highways	750,023.37	416,835.25	303,029.36	315,843.92	442,708.03
Sewers	255,163.98	184,570.73	239,428.49	228,404.77	213,681.29
Other	517,414.72	293,804.36	710,617.73	1,685,303.20	577,959.61
Parks and Recreation	923.46	61,477.07	91,896.66	42,107.39	62,378.51
School Department	79,539.91	582,059.10	684,896.31	187,276.31	512,734.09
Redevelopment					
Library	451,633.75	677,572.69	454,657.79	661,852.33	22,658.57
Total (exclusive of the WSB)	\$ 2,223,933.07	\$ 2,301,145.95	\$ 2,484,526.34	\$ 3,139,914.50	\$ 1,832,176.57
Capital expenditures Exclusive of Redevelop- ment				\$ 2,478,062.17	\$ 1,809,518.00

1957	1958	1959	1960	1961	1962
\$ 364,869.78	\$ 834,285.44	\$ 1,327,456.33	\$ 252,444.74	\$ 199,917.62	\$ _____
157,255.77	166,517.94	134,790.68	77,312.28	113,663.71	_____
199,472.43	1,964,875.00	508,316.10	1,299,860.28	3,788,893.14	_____
342,508.50	545,426.38	375,135.01	150,129.52	303,380.56	_____
1,331,563.35	1,531,393.37	1,912,188.46	794,587.36	1,774,311.32	_____
1,359,079.29	214,408.04	409,520.77	1,391,212.79	8,121,137.25	_____
\$5,754,749.12	\$5,256,906.17	\$4,667,407.35	\$3,965,546.97	\$14,301,303.60	\$8,043,260.00
\$4,395,669.83	\$5,042,498.13	\$4,257,886.58	\$2,574,334.18	\$ 6,180,166.35	\$4,532,231.00

("Capital" spending since beginning of redevelopment -- 1955-1961 exclusive of WSB and Redevelopment -- \$26,738,000 average per year -- \$3,820,000.)

share of the Downtown Master Plan is estimated at \$13,420,000.¹ In addition, during the same years the Redevelopment Agency has planned expenditures costing the City roughly \$10.6 million for projects outside the Downtown Master Plan. These expenditures, totalling \$24 million, would amount to \$3 million for urban renewal purposes. This, with the projected \$3.5 million for other capital projects gives an estimated annual outlay of \$6.5 million on capital projects. Estimates E and F thus show the effect of renewal expenditures in addition to probable capital outlays for other municipal purposes. Estimate E is based on using standard twenty-year serial bonds and Estimate F on using deferrals.

There is some question of the accuracy of the \$24 million estimate. The total price tag for the Downtown Master Plan has been tentatively set at \$111 million. Of this total, the City's share is \$13.4 million, the State's share \$10.9 million, the Federal Government's share \$14.9 million, private sources are to provide \$48.3 million, and a special authority \$23.5 million. The status of the authority is uncertain. There is some question whether private funds will, in fact, be available for all the projects assigned. Also, there has been considerable discussion of the re-evaluation of parts of this project and the contribution the whole project likely to be able to make to the economy of the City. Should the City assume a larger share of this large program, the impact on its finances would be considerable.

Table XLII below is based on the expected net debt figures appropriate to the six estimates discussed above. Debt service estimates were calculated by adding interest and principal on currently existing bonds and the assumed new issues. For new issues a 3 per cent rate of interest was used in making the calculations.

1. Downtown Providence 1970, p. 213.

TABLE XLII

DEBT SERVICE CHARGES--1970

(Assuming 3% interest on the Total Debt Outstanding)
(Thousands)

Estimate	Principal	Interest	Total Debt Service
A	5,221	2,034	7,255
B	3,445	2,312	5,757
C	4,315	1,506	5,821
D	3,440	1,691	5,131
E	5,365	2,102	7,461
F	3,740	2,398	6,138

When the various estimates are combined in Table XLIII for revenue, operating expenses, and capital outlay, it is possible to get a fairly complete picture of the financial prospects of the City, according to the policies to be followed. Largely because of the past use of deferred principal bonds, the tax rate will have to rise at least slightly in the next few years even if there is no increase in other operating budget items and the capital outlay program remains modest. If the avoidance of further tax increases becomes a major goal of policy, control of rising operating costs is vital.¹

Certainly there are many factors that influence the location of industrial, commercial, and residential construction and tax competition is but one. However, a candid appraisal of the economic status of the City and the region reveal no great strengths of resources and locations. Providence must compete for essentially footloose, high-value-added industries that can logically be located in many different places. Therefore, while the tax structure may not be especially adverse, Providence has so few fundamental advantages that it can ill-afford to impose upon itself any additional handicaps. The "Report of the Mayor's Committee on Municipal Revenue" pointed up this issue.

In those industries, however, where the area differentials in nontax costs are small relative to the tax differential, the latter can easily be a significant factor in location or expansion decisions. The nature of much of the industry either in, or appropriate to Rhode Island, is of a type such that most nontax costs differentials (with respect to alternate locations) will be small.²

1. It is not that capital is costless and the City should borrow and spend without reason, but rather spreading out over twenty or more years the cost of borrowed capital greatly reduces the tax rate impact of improvement programs. Whether the City should assume the additional, slight, but long-lasting additional burden inherent in a large-scale capital outlay ultimately rests upon two considerations. First, the impact of capital expenditures upon the City's competitive status as a location and second, what is to be accomplished by a large outlay.

2. "Report of the Mayor's Committee on Municipal Revenue, Providence 1959," p. 77.

TABLE XLIII
SUMMARY TABLE

Projections of Capital Expenditure	Operating Expenses (Except WSB and Debt Service) High Est.	Debt Service	Operating Expenses Total (Exclusive WSB)	To be Financed by the General Property Tax	Tax Rate	Assessed Value	Debt
A1	40,249	7,255	47,504	36,803	49.07	943,667	67,801
B1	40,249	5,757	46,006	35,605	47.47	912,949	77,054
C1	40,249	5,821	46,070	35,656	47.54	914,256	50,215
D1	40,249	5,131	45,380	35,104	46.81	900,103	56,384
E1	40,249	7,467	47,716	36,973	49.30	948,026	70,059
F1	40,249	6,138	46,387	35,910	47.88	920,769	79,934
	Middle Est.						
A2	35,050	7,255	42,325	33,860	45.15	868,205	67,801
B2	35,050	5,757	40,807	32,646	43.53	837,077	77,054
C2	35,050	5,821	40,871	32,697	43.60	838,385	50,212
D2	35,050	5,131	40,181	32,145	42.86	824,231	56,384
E2	35,050	7,467	42,517	34,014	45.35	872,154	70,059
F2	35,050	6,138	41,188	32,950	43.93	844,872	79,934
	Low Est.						
A3	29,850	7,255	37,105	29,684	39.53	761,128	67,801
B3	29,850	5,757	35,607	28,486	37.98	730,410	77,054
C3	29,850	5,821	35,671	28,537	38.05	731,718	50,215
D3	29,850	5,131	34,981	27,985	37.31	717,564	56,384
E3	29,850	7,467	37,317	29,854	39.81	765,487	70,059
F3	29,850	6,138	35,988	28,790	38.39	738,205	79,934

A - Projection on basis of 1961 Capital Improvement Program--no deferred principal bonds.
 B - Projection on basis of 1961 Capital Improvement Program--with no deferred principal bonds.
 C - Projection based on average of past capital outlays, exclusive of Redevelopment--no deferred principal bonds.
 D - Projection based on average of past capital outlays, exclusive of Redevelopment--with no deferred principal bonds.
 E - Projection based on C plus all scheduled Redevelopment and Downtown Master Plan outlays--no deferred principal bonds.
 F - Projection based on D plus all scheduled Redevelopment and Downtown Master Plan outlays--with no deferred principal bonds.

Col. 4 - It is assumed that the property tax meets 80 per cent of operating expenses. The tax on intangibles is assumed to yield \$1,200,000 per year.
 Col. 6 - Indicates assessed values necessary for the tax rate to hold at \$39.00.

Just as the property tax introduces an unwanted effect in biasing the choice of location of economic activity, it is also responsible for biasing a city's choice in spending. Certainly a city has a great many functions -- not all of them clear and agreed upon -- and numerous divergent interests to please. A city should not be operated merely as a business firm with maximization of tax revenue taking an analogous position to profit maximization. Such an action would probably be inconsistent with a variety of other legitimate and more important goals in municipal policy. However, a city with very limited financial resources and a none too robust economic base dare not ignore the effect of its taxing and spending on its tax base. The need for the preservation of the property tax base thus has a strong effect upon municipal decisions. Simply stated, the property tax makes the preservation of property values a far more important object of government than would otherwise be the case. This influence can be seen in Downtown Master Plan for Providence.

The question of how Providence should allocate its funds and what priorities it should set is tied up with these issues. There are many good, worthy purposes crying for municipal expenditure. But, the City cannot do them all. It must try to spend in such a way as to have the greatest effect. Spending money on rehabilitation, for example, is probably desirable. But, if the income and employment base of the area are not improved, how much of a lasting effect will such expenditures have?

Providence has the capacity to carry out a large capital improvement program. The effect on the tax rate of an expenditure of as much as \$25 million would not be beyond the City's reasonable capacity. But the City does not have the ability to make recurrent outlays of such a magnitude. The City should seriously consider making large outlays on capital improvement to improve the City's economic base. The City can afford to construct a superstructure of public buildings, housing, convention centers and the like: but, if it does not first develop a stronger economic foundation to support these facilities, how will they be supported?