To the Graduate Council:

I am submitting herewith a dissertation written by Antoinette Thompson entitled "The Politics of Disinvestment: A Case Study of Infrastructure Disinvestment in Knoxville, Tennessee." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Political Science.

Michael R. Fitzgerald
Major Professor

We have read this dissertation
and recommend its acceptance:

Walter Lyon

Jerry Blades

James A. Sparrow

Accepted for the Council:

Lew Minkel
Vice Provost
and Dean of The Graduate School

THE POLITICS OF DISINVESTMENT: A CASE STUDY OF INFRASTRUCTURE DISINVESTMENT IN KNOXVILLE, TENNESSEE

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Antoinette Thompson

August 1987

ACKNOWLEDGMENTS

I would like to express my gratitude and appreciation to the many people who have assisted me, and without whose help this study or my degree would have been impossible.

Professor Michael R. Fitzgerald, the chairman of my dissertation committee, helped me take an unformulated but intense interest in the physical and financial condition of today's cities and shape it into a research model. He has been a supurb dissertation director, and I have learned much from him about research and urban politics in the process. Any weaknesses or failings in this dissertation are all my own fault. Professors Hyrum Plaas, William Lyons and James Spencer read the dissertation and made valuable comments and suggestions.

I wish to thank the following officials of the City of Knoxville for their assistance in this research effort. They are Mr. Herb Kidd, Director of the Public Service Department, Mr. Robert Bowers, Director, and Mr. Stephen King, Deputy Director, of the Engineering Department, and Mr. Bill R. Elmore, Director, Waste Water Control System.

Special gratitude is extended to Dr. Hyrum Plaas who has guided me and encouraged me in my graduate education and in my work as a public servant. Dr. Plaas is my model, and I hope that I can offer as much to future graduate students in public budgeting and financial management as he has offered to students.

Other professors at The University of Tennessee are owed my gratitude and respect. They are Professors Thomas D. Ungs,

Vernon R. Iredell, Nelson M. Robinson, T. McN. Simpson III, Otis H. Stephens, Robert B. Cunningham, and the late Lee S. Greene, Professor Emeritus.

My parents, Mr. and Mrs. Reuben L. Thompson, gave me material support in my early years as a graduate student, and they have always given me love and encouragement for which I am grateful.

A special work of appreciation is due to my friend, Christopher R. Brown, who has encouraged me to continue with my graduate education. He has read and offered many helpful comments on this dissertation. Most of all he has encouraged me to look forward to my new career with confidence, and this help has been especially needed by this old woman.

An important finding of the study is that those infrastructure which are supported through general obligation indebtedness, such as roads and bridges, have suffered considerable disinvestment compared to those elements of the public capital stock which are financed through user charges, such as the sewer system.

TABLE OF CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION TO THE STUDY	1
	Justification for a Study on Infrastructure	3
	Statement of the Problem	12
	Organization of the Study	16
II.	REVIEW OF THE LITERATURE	18
	Urban Decline Studies	22
	Fiscal Distress Studies	32
	Summary	41
III.	THEORETICAL FRAMEWORK AND RESEARCH DESIGN	43
	An Explanation of the Model	44
	Methodology for a Case Study	60
	The Setting	64
	Study Limitations	68
IV.	AN EMPIRICAL ANALYSIS OF THE COMPONENTS OF THE MODEL	70
	Urban Decline Component	71
	The Fiscal Stress Component	91
	Intergovernmental Aid Component	110
	A Comparison of Knoxville with Regional Cities	122
	A Summary on the Urban Decline and Fiscal Stress Components	134
V.	THE CITY'S INFRASTRUCTURE	138
	The Sewer System	141
	Streets and Roads	156
	Local Bridges	169
	Summary and Conclusions on the Infrastructure	175
VI.	BUDGET TAXING DECISIONS	177
	The Political Environment	178
	Decisions on Taxing and Spending	183
	Property Tax Levies	184
	Summary on Property Tax Levies	203
	The Local Sales Tax	204
	Summary on Local Option Sales Tax	212
	Summary on Taxing Decisions	212

CHAPTER PAGE

Decisions on Capital Spending 215
Capital Spending in Mayoral Administrations 216
Summary on Capital Spending 231

VII. CONCLUSIONS 238

The Knoxville Study 242
Further Remarks on the Research 248

BIBLIOGRAPHY 252

APPENDICES 263

A. SAMPLE OF TWENTY-ONE SOUTHEASTERN CITIES AND INDICATORS 264
B. SEWER SYSTEM QUESTIONNAIRE 265
C. STREETS AND ROADS QUESTIONNAIRE 269
D. BRIDGE QUESTIONNAIRE 275
E. FORMULA FOR CONVERTING SQUARE YARD UNIT COSTS TO COSTS PER MILE 279

VITA 280

LIST OF TABLES

TABLE		PAGE
III-1.	Operational Definitions for Local Environment Component	47
III-2.	Operational Definitions for Municipal Finance Component	52
III-3.	Operational Definition for Intergovernmental Aid Component	53
III-4.	Operational Definition for Urban Decline Component	55
III-5.	Operational Definition for Fiscal Stress Component	57
III-6.	Operational Definition for Budget Decisions Component	59
III-7.	Operational Definition for Infrastructure Disinvestment Component	61
IV-1.	Knoxville: Area, Annexation, and Density	75
IV-2.	Knoxville: Housing Units Built Before 1939 and Owner-Occupied Units	75
IV-3.	Knoxville: Population Growth, 1910-1980	77
IV-4.	Knoxville and Knox County: Population Growth, 1930-1980	78
IV-5.	Knoxville: Population Characteristics, 1960-1980	79
IV-6.	Summary Comparison of Rates of Change in Nonfarm Employment, 1951-1960	81
IV-7.	Percent Change in Knoxville's Employment in Manufacturing Trades and Services, 1963-1982	82
IV-8.	Comparison of Employment in Manufacturing, Trades, and Service Industries in Knoxville and Remainder of Knox County, 1963-1982	83
IV-9.	Per Capita Real Income in Knoxville, Knox County, SMSA and Tennessee, 1960-1980	85
IV-10.	Unemployment and Employment Opportunities in Knoxville, 1960-1980	88

TABLE		PAGE
IV-11.	Persons Below Poverty Level in Knoxville and Knox County, 1970 and 1980	89
IV-12.	State Shared Taxes	98
IV-13.	Revenue, Debt and Expense Indices	99
IV-14.	Per Capita Costs of Local Services in 1972 Dollars Funded by General Fund	104
IV-15.	Comparison of Environmental Factors, 21 Southeastern Cities	125
IV-16.	Comparison of Environmental Factors, Tennessee's Large Cities	126
IV-17.	Comparison of Revenue Factors, 21 Southeastern Cities	129
IV-18.	Comparison of Expenditure Factors, 21 Southeastern Cities	130
IV-19.	Per Capita Revenues and Expenditures in Tennessee's Four Largest Cities (Nominal Values)	132
IV-20.	Intergovernmental Revenues as a Percent of Total City Revenues	133
V-1.	Knoxville Sewer System: Backups and Breaks Per 100 Miles Pipeline	149
V-2.	Knoxville Sewer System: Miles of Sewerlines Cleaned	151
V-3.	Sewerline Maintenance Costs: Nominal and 1972 Dollars; Total and Per Mile	152
V-4.	Sewer Treatment Charges, Selected Years	154
V-5.	Percent Ratings for Roads for Cities in Sample and for Knoxville, 1980	164
V-6.	Estimated Costs per Square Yard to Repair and Restore City Streets	165
V-7.	Estimated Costs to Repair and Restore Streets Below Rating of Good and Actual Expenditures	167
V-8.	City of Knoxville: Bridge and Jurisdictional Responsibility, 1960, 1970 and 1980	169

TABLE		PAGE
V-9.	Bridge Needs by Region	172
V-10.	City of Knoxville: Bridge Needs and Jurisdictional Responsibility, 1960, 1970 and 1980	172
V-11.	Average Daily Traffic of Deficient Bridges by Jurisdictional Responsibility, 1980	173
VI-1.	Tax Rate Increases and Decreases: 1960-1982	184
VI-2.	State Sales Tax Rate and Local Option Limit	205
VI-3.	Record of Local Option Sales Tax Referenda in County and City	205
VI-4.	Long-Term Debt Obligations: 1960 and 1980	216
VI-5.	Total of Capital Expenditures by Categories in Nominal Terms: 1960-1980	235

LIST OF FIGURES

FIGURE		PAGE
III-1.	A Model for Disinvestment in Urban Infrastructure	45
IV-1.	The Percent Change in Nominal Assessed Value of Property Taxed	95
IV-2.	The Percent Change in Real Assessed Value of Property Taxed	95
IV-3.	Comparison of Percent Change in Nominal Value of Property Taxed and Nominal Property Tax Revenues . .	97
IV-4.	Federal Intergovernmental Aid by Functional Categories: Education, Community and Economic Development, and Sewer	113
IV-5.	Federal Intergovernmental Aid by Functional Categories: Transportation, Specific Other, and General Revenue Sharing	114
IV-6.	State Street Aid Revenues and Expenditures, 1972 Dollar Values	118
IV-7.	State Street Aid Revenues and Expenditures, Nominal Values	119
IV-8.	State Intergovernmental Aid by Functional Category: 1960 to 1982	120
V-1.	City of Knoxville: Miles of Urban Streets, 1960, 1970, 1980	157
V-2.	City of Knoxville: Miles of Urban Streets Classified as Very Poor, Poor, Fair, Good, Very Good--1960, 1970, 1980	160
V-3.	City of Knoxville: Percent of Miles of Urban Streets Classified as Very Poor, Poor, Fair, Good, Very Good--1960, 1970, 1980	161
V-4.	City Pavement Condition: Percentage of Miles Classified as Poor, Fair and Good	162
VI-1.	Capital Expenditures for Public Facilities During Mayoral Administrations	219

FIGURE PAGE

VI-2. Capital Expenditures for Public Improvements, Including Streets and Roads During Mayoral Administrations 222

VI-3. Capital Expenditures for Urban Renewal and Economic Development During Mayoral Administrations 225

VI-4. Capital Expenditures for Airport Improvements During Mayoral Administrations 227

VI-5. Capital Expenditures for Sewer System Improvements During Mayoral Administrations 230

VI-6. Capital Expenditures for Equipment, Including Mass Transit, During Mayoral Administrations 232

VI-7. All Capital Expenditures During Mayoral Administrations 234

CHAPTER I

INTRODUCTION TO THE STUDY

This study is concerned with why a city disinvests in its physical structures. This is a legitimate concern for scholars, public officials, and the public whether city dwellers or suburbanites. The central city is still the focal point of the metropolitan area. It is the name of the central city which is most prominent on a map. It is usually the center for governmental and office functions, cultural activities, and higher education facilities. The condition of the central city is important to the whole metropolitan area.

Concern with the infrastructure of the nation's cities is a continuation of urban crisis studies. The focus of concern has shifted over the years, but the concern is always to seek ways to keep the city a vital part of the urban environment. Urban scholars at the mid-point of this century, seeing the beginnings of suburbanization and the fragmentation of political jurisdictions in the urban areas, were concerned with structural reform in urban government. Political and jurisdictional reorganization dominated the literature of the 1950s, and the successful consolidation of several city-county governments were examples to be followed. In the mid-1960s consolidation of political jurisdictions was also a remedy for the growing disparity between central city and outside central city fiscal behavior, with regard to both taxes and expenditures.

Consolidation, however, can disturb the existing power relationships in a city. Examination of community power structures was the

next body of urban literature to be important. By the mid-1960s, however, big cities exploded in flames and violence as frustrated blacks rioted. The literature then focused on the sources of these frustrations--racism, urban education, urban housing, urban poverty, and black power. Black power in the large cities with growing non-white populations was to become an important aspect of community power studies. Neighborhood control over government services was as crucial in the large cities as in suburban communities for residents to benefit from public goods.

After the emotional drain of the "crisis" literature, urban studies concentrated on the input and output of urban politics and government. The delivery of urban services and the variations in a market place of urban communities are examples of these studies. Delivery of urban services, however, is affected by the resources available to a city government. The joining of input and output in government services has spawned a renewal of research in public finance which had once been dominated by the "economics of taxation."

The combination of input (taxation) and output (services) and the environment which produces the taxes and demands for services are important factors influencing the characteristics and changes in metropolitan areas today. One of the policy questions of the day is whether or not central cities which are in trouble financially should be saved. Assuming that economic and social revitalization of the large central cities is the choice made, revitalization of a city depends upon capital investment, both public and private, as well as human resource

development. Because of the legacy of the 1960s and its emphasis on social issues, cities, in concentrating on human resource development, may have neglected capital investment in its infrastructures. Rebuilding the infrastructure of America's older cities is now a focal point of urban research, especially the balancing of its resources between infrastructure needs and the service needs of urban dwellers.

Justification for a Study on Infrastructure

The condition of the nation's infrastructure has been the subject of concern of the national Congress, the states and cities since the late 1970s. The concern has been generated by some spectacular events such as the 1973 collapse of New York City's West Side Highway and the 1983 collapse of Interstate 95 Bridge in Connecticut which killed three people. On the less spectacular side, government reports from agencies such as the Federal Highway Administration and Army Corps of Engineers have determined the extent of unsound highways, bridges, and dams in the United States. Reports by city officials have also noted the deterioration of the infrastructure in urban areas. A 1976 report by the Comptroller for New York City attributed much of the deterioration of New York's bridge system and arterial structures to the lack of a systematic program of maintenance.[1]

Local government officials have lobbied Congress to provide funds to rehabilitate deteriorating roads, bridges, sewer systems and other

---

[1]David A. Grossman, The Future of New York City's Capital Plant (Washington, D.C.: The Urban Institute, 1979), 85.

public facilities. In response, Congress has established an infrastructure council to produce two reports; the first, due September 30, 1985, is to assess current public works needs. State governments have also responded in recent years to local government infrastructure needs by instituting programs to aid in financing capital improvements.[2]

Public and urban professional associations have been active in promoting an examination of infrastructure conditions, needs, and means of financing. In 1982 the American Public Works Association passed a resolution of proposals addressing infrastructure problems. The Metropolitan Association of Urban Designers and Environmental Planners has held two national conferences on infrastructure rehabilitation, and financing infrastructure improvements was an area discussed at the 1984 National League of Cities conference and the 46th Annual American Society of Public Administration meeting in 1985.

The infrastructure "crisis" has also been the subject of numerous magazine and periodical articles. A Business Week article warned in 1981 that the economic expansion predicted by President Reagan requires a strong, healthy public infrastructure, but that many of the nation's cities will not be able to participate in an economic growth program because the private production sector needs adequate water and sewage systems, and well maintained roads, bridges, and

---

[2]Government Finance Research Center of the Municipal Finance Officers Association, Building Prosperity: Financing Public Infrastructure for Economic Development (Washington, D.C.: Government Finance Research Center, 1983), 65.

mass transit systems to get its employees to work and its goods to market.[3]

Still, data on the condition of the infrastructure are rare especially for urban areas according to a 1982 study by the Government Finance Research Center.[4] The most complete inventories and assessments of infrastructure conditions and needs have been by the Urban Institute of selected cities.[5]

Publically owned infrastructure in the nation's cities, however, is part of the larger capital stock of the nation. Tolley and Huckins estimate that municipal urban infrastructure may account for as much as 5 percent of the nation's capital stock, but that the economics of urban infrastructure have been relatively neglected by urban economists.[6] If cost estimates of three trillion dollars to rehabilitate and

---

[3]"State and Local Government in Trouble: The Decay that Threatens," Business Week, 26 October 1981, 136-151.

[4]Government Finance Research Center of the Municipal Finance Officers Association, Indicators of Urban Conditions (Washington, D.C.: Government Finance Research Center, March 1982), IV-28.

[5]David A. Grossman, The Future of New York City's Capital Plant (Washington, D.C.: The Urban Institute Press, 1979); Nancy Humphrey, George E. Peterson, and Peter Wilson, The Future of Cleveland's Capital Plant (Washington, D.C.: The Urban Institute Press, 1979); Nancy Humphrey, George E. Peterson, and Peter Wilson, The Future of Cincinnati's Capital Plant (Washington, D.C.: The Urban Institute Press, 1979); Peter Wilson, The Future of Dallas's Capital Plant (Washington, D.C.: The Urban Institute Press, 1980); Mary John Miller, Marcy Arvin, Bonnie Berk, and George E. Peterson, The Future of Oakland's Capital Plant (Washington, D.C.: The Urban Institute Press, 1981); and Mary John Miller, J. Cester Johnson, and George E. Peterson, The Future of Boston's Capital Plant (Washington, D.C.: The Urban Institute Press, 1981).

[6]Larry E. Huckins and George S. Tolley, "Investment in Local Infrastructure," in Urban Policy Analysis, ed. Terry Nichols Clark (Beverly Hills, Calif.: Sage Publications, 1981), 123.

replace the nation's public facilities between now and the year 1995 are realistic,[7] then the economics of urban infrastructure cannot go neglected for long. Important decisions will have to be made on the allocation of public as well as private monies between consumption and capital investment, and between how much capital investment spending will be made by the public sector and how much by the private sector. Much of the costs of rebuilding the nation's public infrastructure will be the responsibility of state and local governments, but with aid from the federal government. The conditions for the distribution of aid will be an important issue before Congress as it has been in the past to devise distribution formulae for block grants and other federal aid.

The range and complexity of the infrastructure crisis is unknown as public officials start to struggle with this issue in the 1980s. According to Choate and Walter, problems encountered in inventorying infrastructure needs result from an absence of capital budgeting at the national and local levels, an absence of common standards for public work facilities and for services provided, and inadequate inventory data on the age and condition of existing facilities. A lack of political consensus on what types of projects should receive priority adds to the complexity of specifying problems and seeking solutions to the infrastructure crisis.[8]

---

[7]Government Finance Research Center of the Municipal Finance Officers Association, Building Prosperity, 5.

[8]Pat Choate and Susan Walter, America in Ruins: The Decaying Infrastructure (Durham, N.C.: Duke Press Paperbacks, 1981), 30.

Peterson has also written that it is necessary to go beyond comparative impressions of infrastructure deterioration by compiling comparable records of capital stock conditions and maintenance practices. He cites five types of evidence that may be gathered to assess the condition of the infrastructures:

1. direct observation of the wearing out of capital facilities, as gauged by engineering studies;
2. information on maintenance and replace cycles;
3. estimation of the backlog of public capital expenditures that would be necessary to bring capital stock up to adequate standards;
4. information on private sector and other economic losses due to public stock conditions; and
5. data on annual capital and maintenance spending.[9]

Along with determining the extent of deterioration of the public capital stock and the costs to rehabilitate and maintain it in good working condition, it is also important to seek answers to why the nation has disinvested in its capital stock. Since the 1960s and continuing to the present, both the public and private sectors have chosen noninvestment expenditures. Relative levels of the gross national product (GNP) devoted to real private sector investment in production have declined.[10] Public investment by all levels of

---

[9]George E. Peterson, "Capital Spending and Capital Obsolescence: Outlook for Cities," in The Fiscal Outlook for Cities, ed. Roy Bahl (Syracuse, N.Y.: Syracuse University Press, 1978), 57.

[10]Choate, 30.

government have shrank from 4.1 percent of the GNP in 1965 to less than 1.5 percent in 1982.[11]

There are several reasons for the decline in public sector capital expenditures. One of the reasons results from demographic changes in the nation's population. As the nation's rate of population growth has declined and school-age populations decline, there is less need for expansion of school facilities. Another reason for decline can be attributed to the near completion of the 42,500 mile interstate system started in 1956 by the National Highway Act. Today interstate highway needs are for upgrading and maintenance of the existing system.

Other reasons for decline reflect political decisions made by governments. The emphasis on social programs, especially in the 1960s, at the national level shifted money away from capital investment. In the 1970s growth to meet current services, partly hiked by inflation, and transfer payment needs such as Social Security reduced the money available for public works grants to states and localities.

In the mid-1960s 44 percent of federal aid to state and local governments was for capital projects, but by 1980 the figure dropped to 25 percent as operating costs for current services and transfer payments got more of the federal budget.[12] The federal government has also shifted costs to the state and local governments for capital projects. For example, the federal share of grants to localities for

---

[11]Government Finance Research Center of the Municipal Finance Officers Association, Building Prosperity, 3.

[12]Ibid., 7.

construction of sewage treatment facilities has been reduced from the 75 percent level in 1976 to 55 percent in 1984.

At the local level some reduction in capital expenditures has been the result of shifting costs to extend roads, sewer collection and water systems in new subdivisions to developers who contribute these infrastructures to the local government to maintain as public facilities. In rapidly growing southern and western communities as much as half the total value of recent added assets to the public stock come from investment of this type.[13]

Nevertheless, state and local governments nationwide have underinvested in public facilities over a long period of time. In 1968 state and local governments spent $179 (in constant 1972 dollars) per capita for capital projects, but the per capita expenditure had fallen to $96 by 1982, a 46 percent decline over fourteen years.[14]

The causes most often cited for the reduction of capital investment by all levels of government, however, are inflation, falling revenues, and tight budgets.

> . . . the greater part of the decline [in public works investment] reflects the growing habit of government at all levels to cut back on construction, rehabilitation, and maintenance in order to balance budgets, hold down the rate of tax growth, and finance a growing menu of social services. While such approaches keep budgets in balance and meet near-term needs, they impose serious long-term costs. Public facilities wear out and become obsolete.[15]

---

[13]Peterson, 56.

[14]Government Finance Research Center of the Municipal Finance Officers Association, Building Prosperity, 7-8.

[15]Choate, 7.

Maintenance of the infrastructure is one of the first victims of cutback management.[16] When New York City suffered from near financial collapse in 1975, maintenance was one of the first items to be cut in the budget.

> Among the operating activities that were hard hit in the budget cuts of the fiscal 1975 to 1978 period were programs for maintaining the physical infrastructure. Repair and maintenance activities by city staffs and contractors were both cut severely.[17]

In addition to severe maintenance cuts, New York City initiated massive cuts in its capital program for 1975. Partially completed structures were stopped in mid-construction, and plans ready for bid were put on the shelf. Design activities were halted. The only major capital projects which were continued were those funded by intergovernmental grants.[18]

The studies by the Urban Institute found that there was substantial deterioration of the infrastructure in cities that were financially stressed. New York provides an extreme example of capital disinvestment because of the serious financial troubles it has experienced. In Cleveland, the declining economic condition of the city has made it difficult to finance needed capital improvements and maintenance effort has been neglected. Cleveland's capital plant needs to be replaced or

---

[16]Demetrios Caraley, Doing More with Less: Cutback Management in New York City (New York: The Graduate Program in Public Policy and Administration, Columbia University, 1982), 27.

[17]Grossman, 9.

[18]Ibid., 8.

rehabilitated.[19] The condition of Boston's infrastructure varies across type, but in this city, fiscal austerity stemming from restrictions on local property taxes resulting from the 1980 adoption by voters of Proposition Two and One-half affects agencies responsible for construction, maintenance and rehabilitation.[20]

Even though Dallas must raise almost $700 million for water and sewage treatment systems in the next nine years and $109 million more to repair deteriorating city streets, the city's strong fiscal condition places it in a good position to meet its capital needs.

Voter authorized bonds have been the largest source for financing infrastructure improvements for Dallas over the past fourteen years--voters having rejected most often those bonds designated for cultural and recreational facilities. Officials expect continued approval by voters of bond issues for utilities and roads, and the financing burden for current capital outlays is modest considering the city's tax base, its low, stable taxes, and high bond rating.[21]

The infrastructure needs in Dallas and that city's capacity to deal with them are quite different from the needs and capacity of New York, Cleveland or Boston. This contrast underscores the importance of the question as to why a city has disinvested in its capital stock.

---

[19]Humphrey, Cleveland, xv-xvi.

[20]Miller, Boston, xiii-xv.

[21]Wilson, xiv-xv.

Statement of the Problem

There are two important questions which underlie research on the condition of the nation's infrastructure. The first question is to what extent, if any, has a governmental unit engaged in disinvestment in its capital stock? The second question is why has disinvestment occurred, or not occurred, in the governed unit?

Public disinvestment, which means a decline in capital outlays for acquisition and investment expenditures for maintenance of physical assets by a governmental unit, occurs when public officials make budget decisions not to fund or cutback on funding these activities. Wildavsky aptly characterized the budget as a political process:

> Since funds are limited and have to be divided in one way or another, the budget becomes a mechanism for making choices among alternative expenditures. . . . If one asks, "Who gets what the government has to give?" then the answers for a moment in time are recorded in the budget.[22]

In his 1975 budget message, New York State's Governor Gary acknowledged the influence of politics in budget decisions.

> So lavish was the style of government that we came to depend on it for life itself, forgetting that government was only the result of our industry and not its source. . . . Every interest and group and advocate came to think of the [budget] as a cornucopia, a never ending horn of plenty that could pay for more and more each year.
>
> Now the time of plenty, the days of wine and roses, are over. . . .[23]

---

[22]Aaron Wildavsky, The Politics of the Budgetary Process (Boston: Little, Brown and Company, 1964), 2-4.

[23]Peterson, 35.

This passage illustrates that the budget is an allocation of government's resources through a political decision process. It also shows that the fiscal constraint which has characterized many state and city budgets since the mid-1970s will force a new era upon cities.

An obvious reason for the recognition that budget belt-tightening was necessary was the severe state of the nation's economy in the mid-1970s, but it also protends the desire on the part of voters for government to tighten its budget belt. Proposition Thirteen was passed by California voters in 1978 and other revenue caps and expenditure limitation measures were subsequently passed by other state and local voters.

Between 1942 and 1976 state and local governments were "high growth" sectors of the economy. State and local expenditures grew from 6.9 percent of the gross national product in 1949 to a high of 11.4 percent in 1975. After the peak year of 1975, expenditure ratios declined each year to a fifteen year low of 9.9 percent in 1981.

On the revenue side, the ratio of own-source revenue to gross national product peaked for both state and local governments in 1975. State governments reached a 6.2 percent peak and local government peaked at 5.2 percent. By 1981, local government revenues were roughly 4.4 percent of the gross national product which is near the 1959 level.[24] These trends have great significance for local

---

[24]Harry A. Green, Local Government Finance in Tennessee (Nashville: The Tennessee Advisory Commission on Intergovernmental Relations, 1982), 5-8.

governments as they are faced with the problem of deteriorating infrastructure which must be refurbished or replaced.

Michael A. Pagano, in his dissertation "Fiscal Stress and the Financing of Urban Infrastructure," hypothesized that as cities were increasingly strained financially capital investments would be adversely affected. Pagano's hypothesis stated:

> As cities are increasingly strained to generate additional own-source revenues, the maintenance of existing capital stock and capital investment in new infrastructure are adversely affected. As a result, the physical condition of the urban capital stock deteriorates.[25]

Findings from his nine city case study confirmed the hypothesis that fiscally stressed cities did not increase maintenance expenditures on infrastructure or even maintain expenditures at historical levels. Comparative condition ratings for streets and bridges in the nine cities reflected the trends in maintenance expenditures which are a function of the city's capacity to increase own-source revenues from which maintenance funds are derived.[26] Pagano concluded that the worsening condition of the infrastructure and declining maintenance expenditures applied only to those functions that rely on both taxation and are located in fiscally stressed cities.[27]

The basis of Pagano's hypothesis was the assumption that a city's inability to generate own-source revenues in order to prevent

---

[25] Michael A. Pagano, "Fiscal Stress and the Financing of Urban Infrastructure" (Ph.D. dissertation, University of Texas at Austin, 1980), 51.

[26] Ibid., 147.

[27] Ibid., 160.

deterioration of its infrastructure is indicative of fiscal stress. Since New York City suffered its financial breakdown, much research has been devoted to indicators of fiscally sound and fiscally stressed cities. These studies, which will be discussed in the next chapter, have much in common with studies of growing and declining cities because some characteristics used to measure or determine growth or decline of cities are also indicators of fiscally sound and fiscally stressed cities. The federal government has also used similar indicators to determine distressed cities for the purpose of awarding Urban Development Action Grants and a city-needs index for allocating Community Development Block Grant funds.

As a review of these studies will show, there is a distinction between urban distress and fiscal distress, but there are shared characteristics between the two conditions which allow for them to be studied as concurrent conditions of a city. As further support for studying both conditions, financially distressed cities are generally those where significant population redistribution and relocation of economic activities have occurred--signs of urban decline. These changes feed into the political process and major products of the political process are the allocation of cities' resources and fiscal policies which could cause them to be characterized as fiscally distressed. As Howell and Stamm have noted, ". . . it may well be that fiscal stress represents the symptoms of urban problems, not the causes."[28]

---

[28]James M. Howell and Charles F. Stamm, Urban Fiscal Stress: A Comparative Analysis of 66 U.S. Cities (Lexington, Mass.: Lexington Books, 1979), xvi.

Thus this study attempts to go beyond infrastructure disinvestment as a result of fiscal stress by relating fiscal stress to the economic, social and structural conditions of the city. Integrating the environmental condition of the city and fiscal stress may help answer the question of why a city disinvests in its capital facilities.

Organization of the Study

The problem statement presented two questions which are the center of this study. In order to start searching for answers to the questions two concepts, urban decline and fiscal stress, were introduced. These two concepts are explored further in Chapter II which reviews urban research leading to the emphasis on urban decline and fiscal stress studies. This review provides the theoretical ground for development of a model of infrastructure disinvestment by a city. The model will be introduced and explained in Chapter III along with the methods used to apply the model to reality.

The data prescribed by the model are to be presented in Chapter IV, and will be analyzed within the context of the propositions which define the relationships between the model's components. Chapter V examines limited elements of the city's infrastructure to determine if disinvestment has occurred. One of the elements to be examined is the city street network which is maintained by the city and improved by incurring long-term debt. The city's sewer system, which is maintained and operated through user charge revenues, will also be examined for signs of disinvestment. Chapter VI presents

budget decisions relating to taxing and capital spending or disinvestment. Chapter VII will summarize the findings and conclusions on the model and propositions with regard to the Knoxville case study, but an attempt will also be made to suggest refinements to the model as it has been operationalized so that it is applicable to the study of infrastructure disinvestment in other cities and contributes to the development of political research in urban decline and fiscal stress.

CHAPTER II

REVIEW OF THE LITERATURE

The central city is the mother of the metropolitan area. The vast attraction of population from the hitherland or from abroad was first to the cellular city where jobs were available. Technological advancements in transportation provided the means for expansion from the central city to the surrounding areas--first, by residents and later by commercial activities. Thus developed the metropolis. Urban research is concerned with the economic, political, and social behavior of the metropolis as a whole as well as its parts--the central city, its suburbs, adjacent incorporated municipalities, special districts, and urban counties.

By definition the metropolitan area is characterized by economic and social integration and interdependence, but integration and interdependence mask the competition for resources that occur within the metropolitan area. The metropolitan area has been likened to a world of municipal nation-states where delicate negotiations control intergovernmental activity,[1] as a market place which competes for citizen-consumers,[2] and as a coliseum where win/lose games occur between the

---

[1]Matthew Holden, "The Governance of the Metropolis as a Problem in Diplomacy," Journal of Politics 26 (August 1964): 627-647.

[2]Charles M. Tiebout, "A Pure Theory of Local Expenditures," The Journal of Political Economy 64 (October 1956): 416-424.

jurisdictional teams.[3] The urban problem is a struggle among communities and collective groups in communities for public goods.[4]

Political conflict may be inherent in the urban structure because of the place of the central city in the metropolis and its relation to the metropolitan hitherland. Since the mid-1960s urban research has been concerned with the "crisis" of the city. Though it focused initially on racial, housing, transportation, and poverty problems of the large central cities, the focus has shifted recently to the place of the large city in the urban area and what have been the effects on the city as a result of metropolitanization of the hitherlands. Research of this type has examined who moves to suburbia and who stays in the city,[5] the shift in economic activities,[6] and the impacts of suburban growth on central city services.[7] The decentralization of economic activities and the shifts in population, especially middle-income residents, away from the central city into outlying areas of the metropolis have created another generation of urban crisis literature.

---

[3]Norton Long, "The Local Community as an Ecology of Games," in Urban Government: A Reader in Administration and Politics, ed. Edward C. Banfield (New York: The Free Press, 1969), 465-479.

[4]Richard Child Hill, "Separate and Unequal: Governmental Inequality in the Metropolis," American Political Science Review 68 (December 1974): 1557-1558.

[5]Benjamin Chinitz, City and Suburb (Pittsburgh, Pa.: Pittsburgh Press, 1963).

[6]Raymond Vernon, The Changing Economic Functions of the Central City (New York: Committee for Economic Development, 1959).

[7]John D. Kasarda, "The Impact of Suburban Population Growth on Central City Service Functions," American Journal of Sociology 77, No. 6 (1972): 1111-1124.

The report of the National Advisory Commission on Civil disorders joined the various problems in a statement which contains the two elements of the crisis:

> . . . the decay of the central city continues--its revenue base eroded by the retreat of industry and white middle-class families to the suburbs, its budget and tax rate inflated by rising costs and increasing numbers of dependent citizens, and its public plant . . . deteriorated by age and long deferred maintenance.[8]

The current crisis centers on the decline of the central city and the fiscal stress being experienced by these cities.

The signs of central city decay mentioned from the report are measurable. Federal aid programs for urban areas, especially those developed subsequent to the Model Cities program of 1966, have been allocated on the basis of a formula or index of need. The indices are for the purpose of identifying the physical, economic, and social hardships encountered by cities, and they are the operational devices for directing aid to those cities with the greatest hardship.[9] By 1980 approximately fifteen urban distress indices had been developed for the purpose of determining eligibility and distribution of federal aid under Economic Development Administration, Community Development and Urban Development Action grants and the Revenue Sharing

---

[8]National Advisory Commission on Civil Disorders, Report (New York: Bantam Books, 1968), 283.

[9]Robert W. Burchell, David Listokin, George Sternlieb, James W. Hughes, and Stephen C. Casey, "Measuring Urban Distress: A Summary of the Major Urban Hardship Indices and Resource Allocation Systems," in Cities Under Stress: The Fiscal Crisis of Urban American, eds. Robert W. Burchell and David Listokin (Piscataway, N.J.: The Center for Urban Policy Research, Rutgers University, 1981), 163.

program, and for informational purposes such as those used by the Brookings Institute, the Institute for the Future, and the Congressional Budget Office.[10]

The indices developed by the federal agencies and research institutes are grouped into three general types according to use. The first group are called programmatic area eligibility indices. These consist of operational indicators used by federal agencies to establish jurisdictional eligibility for participating in federal grant programs. The second type are relative distress/need indices. The indices in this group are used to measure relative need and rank cities according to their condition of distress. This groups is used for evaluative or illustrative purposes. The third type of indices are resource allocative in that the operational formulae are used for the purpose of distributing federal aid among eligible jurisdictions.[11]

The research review which is the main focus of this chapter is not centered on the indices mentioned above. The variables and linkages of these indices, however, contribute to the urban decline and fiscal distress studies to be reviewed.

Flax has divided urban indicator studies into two purpositive categories. The first category consists of studies which are descriptive and are written for the purpose of comparing specific cities or metropolitan areas, for ranking cities or metropolitan areas, and for

---

[10] Ibid., 165.

[11] Ibid.

providing information. The three general groups outlined above fit into this category. The second category consists of studies which are descriptive but are primarily for advancing and testing hypotheses to illustrate certain situations or to suggest certain policy actions.[12] This latter category of indicator studies will be the focus of this review because these studies provide the support for looking beyond a city's budget decisions to invest or disinvest in its infrastructure to the reasons why such decisions might be made.

Even though it has been stated heretofore that urban distress and fiscal stress studies share characteristics and indicators, the research is separated in this review because the objective of the research is clearly different. The review, however, will demonstrate the similarities of the studies.

Urban Decline Studies

Nathan and Adams were interested in examining the seriousness of social and economic problems faced by the nation's largest metropolitan cities, and the extent of their political isolation in relation to the metropolitan areas of which the cities are a part. For policy decisions, relief measures would be crucial to a central city faced with significant economic and social hardship relative to its suburbs and

---

[12]Michael J. Flax, Survey of Urban Indicator Data 1970-1977 (Washington, D.C.: The Urban Institute, February, 1978), 49.

where it accounted for a relatively smaller proportion of the total metropolitan population.[13]

Central cities are more immediately affected by whatever differences exist in the severity of social and economic problems within its own boundaries in relation to its adjacent suburbs than by competition with other geographically dispersed central cities.

In order to measure central city hardship, an index was developed by Nathan and Adams which used 1970 census data on SMSAs with populations of over 500,000. The six variables measured by Nathan and Adams were unemployment, dependency, educational attainment, income level, crowded housing, and poverty.

City-suburban ratios were calculated for each of the five "undesirable" characteristics, by dividing the city-area value by the suburban value. For the "desirable" characteristic of per capita income, the suburban amount was divided by the city-area amount. The ratios, after being standardized to give equal weight to each characteristic, were summed to get a set of composite index numbers. The composite index numbers were adjusted to a base level of 100. Index figures over 100 denote a primary central city disadvantaged in relation to the balance of its SMSA; the higher the figure the greater the disadvantage. A figure under 100 designates a central city better off than its suburbs.[14]

---

[13]Richard P. Nathan and Charles Adams, "Understanding Central City Hardship," Political Science Quarterly 91, no. 1, (Spring 1976): 47.

[14]Ibid., 49.

Nathan and Adams comment in their conclusion that a number of large central cities face serious social and economic problems in relation to adjoining suburbs. To a significant degree, according to the authors, the social and economic hardship conditions of the central cities studies area a function of governmental structure which leaves them isolated from the surrounding SMSA.[15] Reform measures such as consolidation, annexation, and regionalization are suggested as remedies.

R. D. Norton also found that the "frozen boundaries" of central cities in growing SMSAs is characteristic of old declining cities. Norton's central objective is to develop an historical perspective on two possible federal policy directions in response to the nation's urban problem. The two possible responses are: economic rejuvenation of the older city or the dispersal of the urban poor to areas offering superior job opportunities.[16] In this context, however, the importance of Norton's research is in defining city age and the characteristics of a declining city. According to Norton, the fundamental urban problem is one of nineteenth century cities in a late twentieth century economy, and he set out to develop an index of city age that captures the city's economic and political development.[17] The economic and political legacies of cities offer an explanation for the fiscal policies of

---

[15]Ibid., 60.

[16]R. D. Norton, City Life-Cycles and American Urban Policy (New York: Academic Press, 1979), xii.

[17]Ibid., 17.

old declining cities which differ decisively from the fiscal policies of young cities.

The indicators set forth by Norton offer a set of contrasts between young and old cities. The four crucial contrasts are initial industrial structure of the city; subsequent city and metropolitan growth: city-suburban political separation; and city fiscal position.[18] The data gathered to support his hypotheses are briefly described.

First, Norton ranked in descending order the thirty largest U.S. cities according to their 1910 population. Following his premise that the old cities are industrial artifacts, he divided the thirty cities into two age classes termed old industrial cities and young cities. A third class of six cities were termed anomalous because urban growth in them were not easily ascribed to either of the two major classes.[19]

To establish the contrasting condition of differing economic structure during the growth period of the cities, employment data in manufacturing demonstrated that old cities depended upon manufacturing for economic growth up until 1950. Then growth in manufacturing shifted to the young cities.[20] In addition, Norton investigated job growth in a postindustrial economy by separating manufacturing from trade and service employment and calculating the percentage change from 1947 to 1972. The older cities show a marked decline in manufacturing and an increase in trade and service employment, but the greatest growth in both manufacturing and service employment is in growing cities.[21]

---

[18] Ibid., 23.

[19] Ibid., 18.

[20] Ibid., 19.

[21] Ibid., 108.

Subsequent city and metropolitan growth of old industrial cities in contrast to young cities has differed. Norton gathered data on city population in the thirty largest cities from 1950 to 1975 to measure change in city population, change in the SMSA population, change in the percent of white and nonwhite residents, and the average household income expressed as a ratio of city to SMSA ring.[22] The cities characterized as young doubled in aggregate population while the old industrial cities have lost comparable population. A look at the population change in city and SMSA reveals lost population in the old cities and growth in the SMSA population. The young cities show growth in city population and growth in the SMSA.

Data on racial composition of population change show a declining percentage of whites in the old cities with a greater increase in nonwhite population. In young cities there is a growth in white population as well as growth in nonwhite population, but old industrial cities experienced sharper racial changes coupled with the white population loss.

These population realignments are attributable to decentralization, annexation, and urban-area growth according to Norton. Norton emphasizes that a city's growth is dependent on the degree to which annexation and rapid urban growth counter the tendency toward suburbanization by the white population.[23] In every old industrial city

---

[22]Ibid., 29, 42.

[23]Ibid., 31.

where SMSA population did increase and central city population declined there occurred little or no change in the city's political boundaries. In other words, growing areas were not annexed by the old city to counter its population loss.[24] Population changes have thus caused the old industrial cities to be divided along city-suburban lines and these lines encircle a politically isolated and territorially contained central city. By contrast, young growing cities have expanded their territories into the larger urban areas.[25]

The divergent economic and political legacies of the old industrial cities and young growing cities are reflected in the expenditure and taxes of the city groups. Norton's data on city and local per capita spending in the thirty largest cities show clearly that old industrial cities average more than twice that of the young cities.[26] Norton advanced municipal program assignment and city territorial coverage as explanation for the tendency toward higher spending in old cities, and he found them statistically significant.[27]

On the revenue side, municipal taxes in the industrial old cities were shown to be higher than in young growing cities.[28] Since expenditures are higher does it follow that taxes must be higher, or is there a choice? Norton quotes a former mayor of Houston, Texas:

> In Houston and other Texas cities we are willing to spend property taxes for city services, but only for basic

---

[24] Ibid., 29.

[25] Ibid., 63.

[26] Ibid., 135.

[27] Ibid., 139-140.

[28] Ibid., 146.

> city services like fire and police protection, streets and sewers. Not for welfare matching. Not for a wide range of social service functions that many other cities [do].[29]

Norton thinks there may not be such a choice in old industrial cities. Old cities traditionally carry a heavier program load, but unlike young cities, the taxes cannot be spread among a growing population. Norton found that spending ranged higher in the tightly bounded old cities, whose boundaries contain massive poverty, and that local fiscal institutions affect the taxes. Given the persistence of the economic and political legacies of the old industrial cities, Norton asks whether the old city's officials can "manage decline without driving away more of the tax base?"[30]

The inability of a city or urban agglomerate to perform its economic and social functions as it should is indicative of urban decline according to Bradbury, Downs and Small. In Urban Decline and the Future of American Cities, they analyze urban decline in order to relate it to specific theories about its causes. To test the various theories, the authors define urban decline in both descriptive and functional terms.[31]

In a descriptive sense, urban decline refers to a decrease in such measures as population or employment. Functionally, urban decline means changes that somehow impair the functioning of a city or other

---

[29]Ibid., 141.

[30]Ibid., 147.

[31]Katherine L. Bradbury, Anthony Downs, and Kenneth A. Small, Urban Decline and the Future of American Cities (Washington, D.C.: The Brookings Institution, 1982), 18.

urban agglomeration such as declining per capita income, increase in poverty, increase in crime rates, and declining age composition of the housing stock.

To measure descriptive decline in cities and SMSAs, Bradbury, Downs and Small studied 121 cities of over 100,000 population as of 1970. These cities were the largest in their SMSA. According to population change over time, cities were classified as growing, stagnant (falling in population but not in number of households), or severely declining (falling in both population and households). Standard Metropolitan Statistical Areas were classified as growing or declining.[32]

Indices of decline and distress and measurable components for these indices were developed to measure the functional change in cities. The measurable variables were unemployment rates, violent crime rates, per capita income, percent of population poor, percent of housing built prior to 1940, local government tax effort, and city government debt burden.[33]

Bradbury, Downs and Small gathered data showing a positive relationship between measures of descriptive decline and indicators of functional decline for cities.[34] For SMSAs connections between descriptive decline and functional conditions are less certain; thus cities seem to bear the heaviest burden of functional decline when

---

[32] Ibid.

[33] Ibid., 49.

[34] Ibid., 59.

adjusting to the loss of population and employment within their boundaries.

For this reason, the authors also examined disparities in functional dimensions between primary cities and their SMSAs by constructing an index of disparity and an index of divergence to measure worsening disparity. Correlation coefficients on the data indicate the degree to which decline, distress, disparity, and divergence occur in the same places. In general, however, cities were not doing as well as their SMSAs during the period studied as they had more unemployment, poverty, crime and old housing, and lower per capita income than the SMSAs. In addition, mean disparity and divergence scores for cities underscore the plight of declining cities in declining SMSAs. When cities were ranked in accordance with relative scores on the indices of decline, distress, disparity and divergence, the list shows that all cities which ranked in either of the two dimensions of distress or decline always ranked in the category of worst disparity when compared to its SMSA. On the other hand, cities with the least distress or decline also ranked in the column of least divergence with its SMSA.[35]

With this understanding of decline as both descriptive and functional, Bradbury, Downs and Small go on to test theories of urban decline and their explanatory value for growth and decline of SMSAs and cities growth and decline relative to their SMSAs. They concluded

---

[35]Ibid., 9.

that employment and population loss are key factors in urban decline. Jobs followed people and people followed jobs among SMSAs, but only slight movement to jobs occurred within SMSAs suggesting that workers, regardless of where they live are willing to commute to their jobs in the city or the suburbs.

Their analysis also revealed that some factors of descriptive distress, representing negative changes in key conditions, contribute to functional decline or low levels of desirability as a place to live. For example, high unemployment in the SMSA slowed subsequent SMSA population, and City-SMSA disparities in taxes and concentration of old housing increased the flight to the suburbs by those who were better off and able to afford a move out of the central city.[36]

The studies reviewed heretofore had as an objective the description and measurement of urban decline. There are common indicators in all three studies that are used to measure decline and distress. Yong Hyo Cho and David Puryear have summarized the basic characteristics for measuring urban decline and distress as loss of population, income level and poverty, and levels of unemployment. Other characteristics included in studies are age of housing, crowded housing conditions, proportion of dependent population, education levels, local tax base, and level of local government debt obligation.[37]

---

[36]Ibid., 107-108.

[37]Yong Hyo Cho and David Puryear, "Distressed Cities: Targeting HUD Programs," in Urban Revitalization, ed. Donald B. Rosenthal, vol. 18, Urban Affairs Annual Review (Beverly Hills, Calif.: Sage Publications, 1980), 192, 193.

The characteristics of distress and decline used by researchers are also the same as those identified in the 1978 National Urban Policy report of President Carter as typical of a distressed city. The distressed city was formerly a center of manufacturing; its residential and commercial structures area aged; the city is landlocked by surrounding incorporated municipalities; the city is fully developed; and a substantial minority population lives within the city.

Fiscal Distress Studies

In an analysis of fiscal difference between growing and declining urban areas, Thomas Muller examined the extent to which interregional migration, constraints on boundary expansion by central cities, and related factors contribute to the economic problems of urban areas.[38] Muller defines declining cities and areas in terms of absolute population loss with substantial outmigration by young, middle-income households. From a fiscal perspective, migration is important because it affects personal income, employment, and demographic characteristics which in turn affect the ability of the local population to pay for public services.[39]

According to Muller's data, there appears to be a correlation between private employment loss and large scale outmigration. Most large cities losing population are also losing employment, especially in

---

[38]Thomas Muller, Growing and Declining Urban Areas: A Fiscal Comparison (Washington, D.C.: The Urban Institute, 1976), 2.

[39]Ibid., 4.

the manufacturing sector.[40] Other demographic differences between the declining cities and growing cities include racial composition and economic status of the remaining residents. Black residents as a percent of the population and households below the standard poverty level are higher in declining cities.[41]

Population loss in declining cities, however, does not reduce the per capita expenditures by the public sector for services. In fact, Muller finds that per capita outlays average higher in declining cities than in cities categorized as growing. Muller points out that personnel costs for municipal workers account for a large share of local service outlays which he attributes to the difference in number of workers employed by declining cities and growing cities. Factors advanced as contributing to the large number of municipal employees in declining cities are differences in population characteristics, in age of both the public and private structures, average population density, and concentration of daytime population in a central business district.[42] Another factor contributing to the number of municipal employees is the demand for labor intensive services which Muller writes, "tends to rise as a city expands."[43] The population loss to outer areas or other regions does not reduce the need for fire and police protection or miles of streets, utility lines or parks to maintain.[44] Furthermore, once a

---

[40] Ibid., 35.

[41] Ibid., 36.

[42] Ibid., 42.

[43] Ibid.

[44] Ibid.

large city has undertaken the provision of services, it is difficult to reduce services due to resistance by beneficiaries as well as strong resistance from local employee associations to reduce their ranks.[45]

On the other side of the expenditure ledger are revenues which Muller states increased in declining cities by 113 percent between 1965 and 1973. Per capita payments for property tax are 44 percent higher in declining cities than in growing cities.[46]

Muller found that the main fiscal difference between declining cities and growing cities is that the declining cities spend more for public service, and that operating outlays account for more of the difference than fixed outlays. However, fixed outlays such as current capital expenditures and those reflected in nonutility long-term debt levels are substantially higher in declining cities.[47] The major factor contributing to the higher operating outlays in declining cities is personnel.[48]

From a fiscal perspective, annexation is beneficial to the central city because per capita outlays for public services are lowered by capturing middle-income residents who are leaving the urban core or immigrating from other areas. More importantly, however, it absorbs large areas of open land where future expansion is most likely to take place.[49] There is little prospect for declining cities to grow by

---

[45] Ibid.

[46] Ibid., 67.

[47] Ibid., 75.

[48] Ibid.

[49] Ibid., 77.

annexation, however, and their population strength at metropolitan, state and federal levels diminish as their percent of total voting population decreases.[50]

Though Muller's study focused on fiscal differences between growing and declining urban areas, in an appendix he briefly discusses intrametropolitan differences in cost to provide public service. It is no surprise that he found in large metropolitan areas that the central city characterized as declining employed substantially more workers at higher wages than the surrounding inner and outer suburbs or the county.[51]

In a study of municipal fiscal stress undertaken by the First National Bank of Boston and Touche Ross & Company, one of the principal findings was that older industrially aged cities are the ones most likely to have high tax, debt, and expense ratios and to be fiscally stressed.[52]

Howell and Stamm, the principal researchers for this study, contend that municipal stress cannot be described on the basis of economic, social, and structural conditions alone, but must include financial indicators.[53] The financial variables used by Howell and Stamm measured revenues, debt and public expense.[54]

---

[50]Ibid., 80.

[51]Ibid., 105.

[52]James M. Howell and Charles F. Stamm, Urban Fiscal Stress: A Comparative Analysis of 66 U.S. Cities (Lexington, Mass.: Lexington Books, 1979), 4.

[53]Ibid.

[54]Ibid., 40-44.

In order to determine the relationship between economic, social and structural conditions and the financial performance variables, a list of nonfinancial indicators, traditionally used as proxies for municipal financial variables by some researchers, was drawn up. The economic variables included change in population, percent change in single-family housing starts, manufacturing capital spending, change in manufacturing employment ratio, percent change in manufacturing capital spending, and median family income. The social variables were percent of minority population, percent of families below low-income level, unemployment rate, and percent of pre-1939 housing stock. The structural variable was the density of the city population.[55]

Howell and Stamm examined variations in municipal financial performance with regard to their sensitivity to the economic, social and structural conditions across the sixty-six large cities. Further, the economic indicators were used to classify the cities by stages of economic growth or decline in order to measure municipal financial performance against the industrial aging of the cities.[56]

After analysis, linkages between economic, social and structural conditions and municipal financial performance across all variables were uneven. There did appear clear linkage between the socioeconomic and structural variables and the financial variable of ratio of local taxes to personal income, local taxes per capita, fire expenses per capita,

---

[55]Ibid., 6.

[56]Ibid., 59.

health expenses per capita, and ratio of city full time equivalent employment to total local employment.[57]

The relationships follows a consistent pattern which revealed that when worsening economic conditions are coupled with large dependent or high density population, per capita fire and health expenses as well as full time equivalent employment will go up. In time, this condition can be translated into higher taxes which in turn may lead to higher expenses.[58]

On the revenue side, the role of intergovernmental transfers provided a significant finding. As population density and dependent population increase cities qualify for more federal and state funds. When worsening economic conditions are added to the equation, however, there is little change in intergovernmental transfers. Thus when economic decline is joined with increasing population density and dependence, fiscal stress is often the result. Under these conditions, local financial sources are diminished but there is not a corresponding increase in intergovernmental aid.[59]

In analyzing the data for relationships between municipal financial performance and aging industrial cities there are three important conclusions. First among old industrialized cities there is high municipal capital spending per capita.[60] There are several possible explanations advanced for this. Some portion of capital spending may in reality be

---

[57] Ibid., 76.

[58] Ibid.

[59] Ibid., 77.

[60] Ibid., 107.

current expenses, or costs of capital repair and maintenance of existing and outdated infrastructure may be high.[61]

Second, tax effort, taxes per capita, and operating expenses per capita become much higher as the industrial age of a city progresses, reaching the highest ratio of expenses to taxes in the middle phase of aging. The researchers hypothesize that the rise in taxes results from long-term deterioration of the aggregate value of taxable property in the economic base as manufacturing firms leave the city.[62]

Third, the ratio of full time equivalent municipal employment to total employment is quite high in old industrialized cities, more than twice the mean of all cities studied.[63]

Howell and Stamm define fiscal stress as a dynamic adjustment process between a city's financial capacity and the citizenry's demand for public goods and services. An imbalance between financial capacity and demand for public goods and services cannot be sustained for long without seriously affecting the tax rate and debt service of a city.[64]

In contrast to Howell and Stamm, another study has associated urban decline cities with increasing support from intergovernmental aid. Cities which have lost a substantial part of their economic base and revenue producing capacity become dependent on revenue from multiple levels of government in order to provide routine public

---

[61] Ibid., 109.

[62] Ibid.

[63] Ibid., 112.

[64] Ibid., 123.

services. These cities, called intergovernmental cities, are the subject of a study by the Center for Urban Policy Research.[65] The study traces the emergence of this group of cities over the past two decades, and compares the performance of their resource base with a group of nonintergovernmental cities.

Intergovernmental and nonintergovernmental cities studied were selected on the basis of their population size, direction of population change, and dependence on other than local intergovernmental revenue transfers.[66]

Cities isolated as intergovernmental in this study are also those cities identified as distressed on city hardship rankings such as the HUD-UDAG Index, the CBO Urban Need Index, and the Urban Institute Economic Performance Index.[67] The agreement in the ordering of hardship across cities point to a constellation of communities that appear impacted and a grouping of cities which seem to be in much better condition.[68]

The isolation of older, declining cities by distress criteria meant that funds distributed by the governmental agency that directly or indirectly developed the index would flow to these distressed cities rather than to healthy, growing cities. Since most indices produce

---

[65]Robert W. Burchell, James H. Carr, Richard L. Florida and James Nemeth, The New Reality of Municipal Finance: The Rise and Fall of the Intergovernmental City (New Brunswich, N.J.: Center for Urban Policy Research, 1984).

[66]Ibid., 19.

[67]Ibid., 32.

[68]Ibid., 36.

similar results, a distressed city most likely would be the recipient of considerable intergovernmental transfers. To an overwhelming extent the cities classified as intergovernmental in 1980 were assigned the most severe distress rankings in the 1970s.[69]

In summary, intergovernmental cities are those where the major portions of outlays for local public services were paid for by other levels of government. These cities have had to raise more revenues to cover local expenditures than other comparably sized cities and to do so from evershrinking property tax bases. As this situation was faced by these cities, they turned to the revenue resources of other governments. Service delivery and staffing were no longer exclusively determined at the local level but were a reflection of the priorities of these other governments. On the other hand, nonintergovernmental cities spent less money to finance public services, and most of the revenues came from their own resources.[70]

From the study there are a number of basic findings central to understanding municipal budgeting in intergovernmental cities. On the expenditure side, aging intergovernmental cities spend more overall than younger nonintergovernmental cities. Intergovernmental cities spend larger shares of local revenues for essential services such as police and fire protection but significantly less for infrastruction development, an area which exhibits tremendous need for upgrading

---

[69] Ibid.

[70] Ibid., 37.

due to the conscious deferral of capital improvements as part of a strategy to overcome fiscal constraints.[71]

These conclusions lead one back to Howell and Stamm's description of fiscal stress as a dynamic adjustment process between financial capacity and demand. There is implied in the balancing process the concept of limits to the amount of resources available to satisfy municipal service among competing needs, such as public safety, education, aid to the indigent, general government services, and maintenance, rehabilitation and additions to the city's capital stock.

Summary

Urban decline, especially central city decline, is rooted in demographic and economic changes. Demographic shifts in the nation, regionally and locally, have left central cities increasingly the focal point for the distressed and impoverished. Employment opportunities in the nation have also shifted. Unemployment is higher among central city residents than in suburbia and higher in the old industrial urban areas than in the new manufacturing centers of the growing cities.

Demographic and economic shifts have an impact on the fiscal health of the central city. Population loss, especially of the better-educated, higher-income families, magnifies the financial strain on cities by depleting taxable resources. Public expenditures do not drop proportional to the population loss. In fact, there are forces at work which increase the expenditures of declining cities.

---

[71] Ibid., 256.

An imbalance between the demand for public services and available taxable resources to pay for the services lead to fiscal stress. At the point where public sector costs are overdeveloped compared to local financial capacity, it is necessary for elected officials to make adjustments in the imbalance by decreasing services or raising taxes. One of the ways city officials have adjusted the imbalance is to disinvest in the city's capital assets. This takes the form of reducing outlays for maintenance and lower levels of expenditure for new capital investment. In essence, it is borrowing against the city's capital facilities for ready cash to fill the gap between demand for services and available resources. The decision to disinvest is the subject of this study and the model of infrastructure disinvestment in a central city.

CHAPTER III

THEORETICAL FRAMEWORK AND RESEARCH DESIGN

The purpose of this study is to describe the extent to which infrastructure disinvestment has occurred in the City of Knoxville and to look for answers as to why this has happened. The predominant reasons for disinvestment, according to the contemporary literature, are fiscal constraints imposed on local government by voter resistance to increasing taxes, declining intergovernmental aid, and declining own-source revenues. Political reasons for disinvestment, however, are crucial in seeking answers to why. The refrain that "streets don't vote" has been employed as an explanation, but city residents who live and drive on the streets do vote. The political reasons go beyond this simple saw to decisions and choices made by public officials at the time budgets are adopted and taxes are set. These decisions do reflect the political interests and bargains that predominate at the time, and the decisions are part of the fiscal constraints that may cause a city to disinvest in its capital facilities.

In order to begin to explain why a city engages in disinvestment in its infrastructure it is necessary to approach the question within a conceptual framework, and in order to prevent this study from being particular to one city it is necessary to seek explanations which are general to cities.

To generalize the explanation two concepts from urban research have been adopted. These two concepts are urban decline and fiscal

stress, and they are the basis for development of a model of urban infrastructure disinvestment. The purpose of this model is to provide the skeletal representation of interrelationships of variables in the urban environment which are important to the general problem as stated in the research questions. The model presents the concepts and the operational definitions of the concepts. The model, in this study, is empirically applied to one city, but because it is general and operationalized by universal indicators capable of being observed in other cities it is testable by other researchers. The model also provides a means of explanation of change. The word disinvestment implies that change has occurred. The operationalized concepts provide a means to measure the change and provide the basis for an indepth analysis of the process of disinvestment.

An Explanation of the Model

The model, as an abstracted simplification of reality, incorporates factors and their relationships which are significant in this study of infrastructure disinvestment by a city. The significant factors have been grouped in components which are defined and operationalized in measurable terms in order to observe if reality fits the model of infrastructure disinvestment. Each component provides the basis for a proposition which describes the outcome of the mix of component factors and the relationship of that component to the chain of events in the model which result in investment or disinvestment in the city's capital stock. Figure III-1 is an illustration of the model. The model

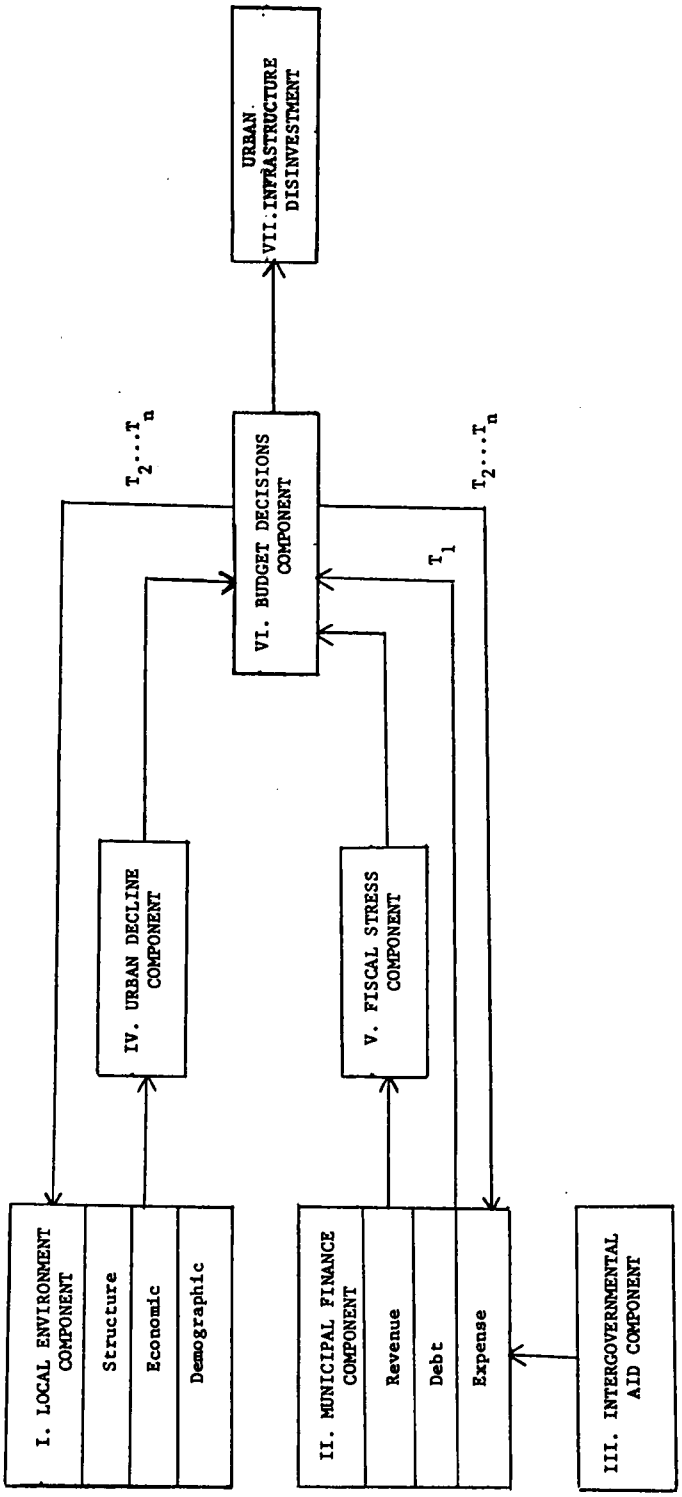


FIGURE III-1. A MODEL FOR DISINVESTMENT IN URBAN INFRASTRUCTURE.

is composed of the key components which have been used to describe urban decline and fiscal stress and the factors which are likely to impinge on the decisions of policymakers to invest or disinvest in the city's capital stock. Each component of the model and its operationalization is explained in the sections to follow.

Component I. Local Environment

The elements of the first component are structure, economic and demographic factors particular to the city. Structure in this study has two parts. It means the physical jurisdiction of the city, but it also includes the physical characteristics of the city in the age of its housing structures and the density of the population. The economic element of the local environment is the city's revenue resource base as well as the base for job opportunities available to the city's inhabitants. The demographic element describes certain characteristics of the city's population which researcher have used as indicators of urban decline. Three of these factors describe a dependent population, and the fourth is a measure of population loss or gain. The elements of the local environment component will be studied over a period of twenty years in order to determine change in these elements.

In Table III-1, the elements of the local environment component are displayed with the measurable indicators selected to describe the environment which affects the provision of public services delivered by a city and its ability to pay for these public services. Brief statements link the indicators to the proposition. Proposition I forms the basis for the analysis of the local environment component.

TABLE III-1

OPERATIONAL DEFINITIONS FOR LOCAL ENVIRONMENT COMPONENT

Component	Indicator	Link to Proposition
Local Environment		
A. Structural	1. Square Miles Incorporated	Failure to incorporate middle-income residential households within city increases per capita outlays for services; reduces nonbusiness revenues per capita
	2. Percent of Total Housing Stock Built Prior to 1940	Increase in percent of aged housing indicates newer residential property not being added to city's tax base; increasing age of housing increases city expenditures for fire protection, codes enforcement
	3. Density per Square Mile	Decrease in density without compensating increase in incorporated area indicates loss of residential population; lower resident population does not reduce service costs per capita or maintenance costs
B. Economic	1. Change in Manufacturing Employment	Decline in manufacturing employment indicates loss of job opportunities for city residents; loss of manufacturing enterprises by city
	2. Number of Employees in Retail; Service Industries; and Wholesale Trade as Ratio to Total Labor Force	If manufacturing employment declines, is there compensating growth in other sectors? Loss or slow growth indicates a decline in economic and employment opportunities for city; loss may be to areas outside city
	3. Unemployment Rate	Increase in rate of unemployed persons or slow decline in this statistic indicates depressed job opportunities for city residents
	4. Ratio of Employment to Population	Decline in ratio of employment to population indicates restricted job opportunities

TABLE III-1 (continued)

Component	Indicator	Link to Proposition
	5. Per Capita Income	Slow growth is indicative of potential problems in the ability of government to provide current levels of service with less ability to raise revenues
C. Demographic	1. Population Loss or Gain from 1965 to 1984	Indicates that a city is losing its population to areas outside its incorporated limits
	2. Percent Black Population	Blacks generally have lower incomes and higher unemployment; concentration of blacks in city may be source of special needs that take part of city's budgeted resources without potential to contribut to city's resource pool
	3. Percent Families Below Low-Income Level	Increase in percent of families in poverty impacts revenue and expenditure side of city's budget, indicating higher-than-average needs in services with a lack of ability to pay taxes and lack of purchasing power in city's economy
	4. Percent Population Below 18 Years of Age	Used as a measure of dependency; persons under 18 are generally not counted as part of productive labor force; increase in number of persons under 18 does produce need for city to provide educational and recreational services; decline in this age group should be reflected in less money for education
	5. Percent Populationge group Over 65 Years of Age	Indicator of dependency; persons over 65 are not counted as part of productive labor force; increase in this age group may be reflected in increased need for senior citizens' recreational services and public transportation; increasing old population in city indicates younger productive persons are moving out or not moving into city

Proposition I

A. When a city's boundaries are not extended to incorporate areas of new or potential development, the city fails to "capture" middle-income residents who are leaving the city and thus expand its taxable resources and lower per capita outlays for services. The failure to incorporate new areas increases the percentage of aged structures in the city, thus increasing the costs for public protection and decreasing the desirability of the city as a place to reside.

B. A city experiencing slow growth or a deline in job opportunities and per capita income of citizens will be less able to generate own-source revenues to sustain current levels of public services and investment in its capital facilities.

3. A city which is losing the productive segment of its population, and increasing in population segments which are dependent, will be less able to increase own-source revenues to pay for public services and investment in its capital facilities.

Component II. Municipal Finance

The municipal finance component is comprised of the basic elements of a city's financial performance. The revenue element is the money generated by the city from local taxes and charges used to finance the government's operations and debt. The debt element represents the fixed costs to repay the principal and interest on money borrowed on a long-term and short-term basis by the city for

operating expenses and capital expenditures. The expense element represents expenditures by the city for services, for capital expenditures, and maintenance of the capital infrastructures.

The municipal finance component encompasses what the city delivers in the way of services and how it pays for the services. This component, studied over a period of twenty years, offers the opportunity to observe a trend in the costs of services delivered, how the costs have changed among various services, and how taxes and other revenue sources have been adjusted to pay for government's costs. When analyzed with changes in the local environment component, the following propositions form the basis for analysis.

Proposition II

A. Inability to tax new sources concentrates the taxes on city residents and existing resources. Tax increases on a slow growing or declining tax base will be resisted by citizens remaining in the city and by elected officials.

B. Increasing debt per capita in a city with a declining population places a burdensome future liability on the city already limited by its taxing capability. This situation will inhibit future debt incurrence by the city for capital improvements and maintenance of its infrastructure.

C. Increasing expenses of government require that revenues be increased to cover them. Expenses increase because of demands for services on the part of the population, demands

by city employee associations for higher wages and benefits, and resistance to reducing current levels of services.

Indicators of the elements in the municipal finance component and their link to Proposition II are shown in Table III-2.

The municipal finance component will be affected by intergovernmental aid, both federal and state. Intergovernmental aid targeted for specific programs and projects may direct local resources to these programs and away from some other services provided by local government. General purpose intergovernmental aid may enable a city to continue to provide services, despite rising costs, without increasing local revenues. The intergovernmental aid component and its proposition follow.

Component III. Intergovernmental Aid

Intergovernmental aid is money transferred directly to the city by the federal government for special purposes or projects and for general purposes. Intergovernmental aid also includes federal aid which is passed through the state government to local projects, and state aid for special purposes, state transfers to the city of shared taxes, and transfer payments from the county to the city government. Intergovernmental aid is usually listed as revenue in a city's budget. The intergovernmental aid indicators and the links to the proposition are shown in Table III-3. The proposition is as follows.

Proposition III

Intergovernmental aid for specific programs or projects will direct local resources to these programs and projects. When the aid is

TABLE III-2

OPERATIONAL DEFINITIONS FOR MUNICIPAL FINANCE COMPONENT

Component	Indicator	Link to Proposition
Municipal Finance		
A. Revenue	1. Ratio of Local Taxes to Property Value	Increasing ratio of local taxes to city property value indicates city has increased its taxes in order to generate income from declining or slow growing tax base
	2. Local Taxes per Capita	Measures the extent of increase; may indicate per capita increases as city population decreases
B. Debt	1. Total Debt per Capita	Increasing debt per capita indicates city committed to future liability which may prevent city from undertaking additional debt obligations
	2. Interest per Capita	Total current interest is an annual expense which must be covered by budget
C. Expenses	1. Municipal Capital Spending per Capita	Capital spending increases as economic, social and structural conditions worsen; increasing capital spending may suggest city is beginning the costly process of upgrading aging infrastructure
	2. Fire Expenses per Capita	As economic conditions worsen, fire expenses rise; large dependent populations, high density populations, and aged structures increases fire expenses
	3. Police Expenses per Capita	Concentration of daytime population in city increases need for police protection; emptying out of city at night time, with concentration of low-income and deteriorating neighborhoods, increases need for police protection
	4. Other General Government Expenses per Capita	Per Capita spending for government services increases in declining city
	5. Ratio of City FTE Employment to Local Employemnt	Ratio of municipal FTE employment to total local employment increases as economic, social and structural conditions worsen
	6. Average Monthly Wages of Municipal Workers	Increasing wages of municipal workers indicate ability of employee associations to press for favorable wages and benefits

TABLE III-3

OPERATIONAL DEFINITION FOR INTERGOVERNMENTAL AID COMPONENT

Component	Indicator	Link to Proposition
Intergovernmental Aid	1. Federal Aid for Specific Programs and Projects	When there is an increase in federal aid for specific programs which require local matching funds, city will use its local resources to match federal funds; when this aid is reduced, city will have to increase its funding to maintain program at current levels
	2. Federal Aid for General Purposes	When there is an increase in federal aid for general purposes, cit will use these funds rather than increase local revenues to maintain services; when these funds are reduced, new local revenues will have to be increased or services reduced
	3. State Aid for Specific Programs and Projects	
	4. State Transfers of Shared Taxes for General Purposes	

reduced or discontinued, a city will have to increase its revenues to continue the programs. Intergovernmental aid for general purposes will allow the city to carry on services without increasing revenues, but when general purpose aid is reduced or discontinued, the city will have to increase its revenues to continue services or reduce the services without an increase in taxes.

Component IV. Urban Decline

Urban decline, in this study, is a deteriorating condition of a city at the present time relative to its past. Urban decline means that a city has lost population and job opportunities, and has not been able to capture by annexation growth occurring in the surrounding metropolitan area. Measurable decline in productive population, employment, and taxable resources impair the social and economic functions of a city by creating additional needs without creating additional potential to pay for them.

The indicators of urban decline incorporate the descriptive indicators of the local environment. Table III-4 lists the indicators and the link to the proposition on urban decline.

Proposition IV

A city is suffering from urban decline when it fails to expand and incorporate into its jurisdiction unincorporated developing residential and commercial areas on its fringes in order to "capture" these taxable resources and reduce the aging process of its own area. The condition is exacerbated by the loss of employment

TABLE III-4

OPERATIONAL DEFINITION FOR URBAN DECLINE COMPONENT

Component	Indicator	Link to Proposition
Urban Decline	1. Failure to Expand City Limits	Increasing demand and need for governmental services without an increasing ability to pay for governmental services
	2. Increasing Percent of Housing Stock Aged	
	3. Loss of Industry	
	4. Loss of Employment Opportunities	
	5. Slow Growth in Population	
	6. Increasing Dependent Population	

opportunities in the city and the loss of the city's productive population coupled with an increasing dependent population. These conditions create demands for services which the city is less able to afford.

Component V. Fiscal Stress

Fiscal stress is an imbalance between financial capacity and the demand for public goods and services. Fiscal stress arises when a city cannot sustain its services with the revenues available to it.

The indicators of fiscal stress are based on the municipal finance and intergovernmental aid components. The indicators and the link to the proposition on fiscal stress are listed in Table III-5. The proposition is as follows.

Proposition V

When city expenses increase and taxes and debt are increased to cover these costs, at the same time that the city's capacity to increase own-source revenues is declining, an imbalance occurs between financial capacity and the demand for city expenditures.

Component VI. Budget Decisions

Budget decisions are the decisions of a city's mayor and legislative body to levy taxes and charges and to use other sources of revenue to finance the city's appropriations for public goods and services. Budget decisions are made at the time a city's budget is adopted and taxes are established, but budget decisions may be made throughout the fiscal year in executing the adopted budget. These

TABLE III-5

OPERATIONAL DEFINITION FOR FISCAL STRESS COMPONENT

Component	Indicator	Link to Proposition
Fiscal Stress	1. Increasing Taxes and Debt per Capita with Slow Growing or Declining Taxable Resources	Increasing taxes and debt without an increase in ability to pay and increasing governmental expenses create an imbalance between financial capacity of city and the provision of governmental services
	2. Increasing Expenses	
	3. No Reduction in Expenses	

latter decisions will be significant to this study only if they involve a reduction in the budget by reducing services or city employees, or cancellation of scheduled projects because of shortfalls in revenue collections.

Budget decisions are made within the context of the local environment which generates needs that demand a level of service and within the context of the municipal finance component or past financial performance of the city. When the local environment is characteristic of a city suffering from urban decline it is likely that the demand for public services and costs to provide them will continue to increase. When the city cannot sustain its current level of services with the revenues available to it, the city is also experiencing fiscal stress. The elements of the budget decision component to be examined are listed in Table III-6. The proposition is as follows.

Proposition VI

> Elected officials as budgetmakers will make decisions to raise taxes and incur greater debt liability in order to continue to provide the same level or increased levels of services, or decisions will be made not to raise taxes and to reduce service levels in order to balance the city's expenditures with its revenues. The budget decisions are made in an environment of competing demands for the city's resources.

Component VII

Infrastructure disinvestment means a decline in capital expenditures for acquisition and investment expenditures for maintenance of a

TABLE III-6

OPERATIONAL DEFINITION FOR BUDGET DECISIONS COMPONENT

Component	Indicator	Link to Proposition
Budget Decisions	1. Increase Taxes	Budgetmakers will increase taxes to cover increased expenses; taxes will not be increased and reductions in city expenditures will be made
	2. Increase Expenditures	
	3. No Increase in Taxes	

city's physical assets. As pointed out in the section on significance of a study in infrastructure disinvestment, maintenance of a city's capital stock is one of the first victims of fiscal stress and cutback management in the nation's declining cities.

The elements to be examined in the city's budget for infrastructure disinvestment are listed in Table III-7 with the link to the proposition.

Proposition VII

> Infrastructure disinvestment will occur when a city is suffering from urban decline and fiscal stress which reduces its capacity to generate additional own-source revenues to cover the costs of current services and the acquisition, maintenance, and rehabilitation of its capital facilities.

The components of the model of infrastructure disinvestment have been set out in terms of indicators which are measurable for change over the time period to be covered by this study. The components and the propositions are linked to an outcome which can be measured by how much the city has spent through the years on acquisition and maintenance of its physical assets. The methodology and setting for the study are covered in the next section.

Methodology for a Case Study

The methodology used to investigate the question on infrastructure disinvestment within the constructs of urban decline and fiscal stress is the case study. The case study is an indepth analysis of a

TABLE III-7

OPERATIONAL DEFINITION FOR INFRASTRUCTURE DISINVESTMENT COMPONENT

Component	Indicator	Link to Proposition
Infracstructure Disinvestment	1. Less Money Spent for Capital Facility Acquisition	Budgetmakers will decrease expenditures for capital facilities acquisition and maintenance of infrastructure to fill the gap between other governmental expenses and revenues
	2. Less Money Spent for Maintenance and Upgrading of Existing Infrastructure	

single unit for the purpose of describing an outcome, testing theories, or developing hypotheses.[1]

In this study the research question asked is, to what extent has Knoxville engaged in infrastructure disinvestment and why? Thus there is an outcome to be described. Disinvestment has occurred or not occurred in a particular city. The second part of the question, why has disinvestment occurred or not occurred, describes selected ex post facto events and conditions which are antecedents to the outcome. The questions, however, are related to two theoretically constructed concepts: urban decline and fiscal stress. These two concepts single out the relevant factors and information to be used to describe the dynamics of disinvestment in a city's infrastructure.

The relevant information are social, structural and economic indicators which are integrated into a model of urban decline, and fiscal performance measures or indicators integrated into a model of fiscal stress. The case study then goes beyond description to analysis and integration into a model which seeks to specify a relationship between the constructs of urban decline and fiscal stress and infrastructure disinvestment.[2]

The case study method requires the use of data used by contemporary historians, but the analysis and interpretation of the data

---

[1]Stephen L. Wasby, Political Science: The Discipline and Its Dimensions, An Introduction (New York: Charles Scribner's Sons, 1970), 157-158.

[2]Terry Nichols Clark, "Community Social Indicators: From Analytical Models to Policy Applications," Urban Affairs Quarterly, 9, no. 1, (September 1973): 3-5.

rely on urban economics and political theories reviewed previously. The major sources of data will be governmental documents, specifically budget appropriations and financial audits, official records of city council meetings, along with the resulting resolutions and ordinances, official memorandum when appropriate, newspaper accounts, and elite interviews when the information sheds light on the reasons for specific decisions or nondecisions.[3]

In addition to the data from city documents and interviews, this research will require the use of extensive economic, social and population data. Most of the information is available from documents published by the Bureau of the Census and Bureau of Economic Analysis, U.S. Department of Commerce, and the Bureau of Labor Statistics, U.S. Department of Labor. The use of this information is not without disadvantages. Nationally published data are aggregated data compiled on the local jurisdictional level by mass questionnaires distributed by the national government. Because the data are collected periodically, there are problems encountered with the collection of the data and the "lag" time between collection, compilation, and publication which may range from months to three years. The use of nationally collected aggregate data, however, is valid materials source for the study of the external structures of a community.

There are other sources to complete gaps in this information. These other sources are the Tennessee Statistical Abstract published

---

[3]Lewis Anthony Dexter, Elite and Specialized Interviewing (Evanston, Ill.: Northwestern University Press, 1970), 5.

by the Center for Business and Economic Research at the University of Tennessee and publications from the Knoxville-Knox County Metropolitan Planning Commission.

Analysis of the data collected for this study will be to calculate change over time in the indices selected. The model of infrastructure disinvestment has been built around indicators which may establish a direction of change in the variables over time. Since the data cover a twenty year period it is possible to establish long-term or secular trends in the variables. The time-series analysis may be graphically displayed as a test of the propositions contained in the model.

Change in the indicators are relevant to the constructs of urban decline and fiscal stress, and changes in the indicators are linked to the propositions in the model of infrastructure disinvestment. Variations in the trends are expected to occur and these are important to this research. In studying the politics of infrastructure disinvestment one needs to explain why there will be city activities which will receive a large share of the city's resources at one time or another. This is part of the politics of competition for and allocation of the city's resources through the budget process.

The Setting

The setting for the case study is Knoxville, Tennessee, a city of 175,045 people in 1980. The study covers the period from 1960, two years before the last large annexation by the city, to 1982, the year of the 1982 World's Fair, called by its promoters as Knoxville's "quantum jump" toward being a modern city in the postindustrial age.

Knoxville is a unique city. It cannot be characterized as a growing city of the Sunbelt, but neither is it an old industrial city of the Frostbelt. It is in a southern state, but geographically it has been an isolated city, surrounded by large mountain chains that cut it off from other southern cities. Knoxville's history has also been different from other southern cities, having been strongly influenced by the Appalachian culture of its early population. According to historians McDonald and Wheeler, the "otherness" of Appalachia still influences the culture, the politics, and the economics of Knoxville.[4]

After the Civil War, Knoxville became a major southern commercial center aided by its railroad connections. In 1885 it was the fourth leading wholesale center in the south behind New Orleans, Atlanta and Nashville,[5] and by this time the city's manufacturing sector was growing in importance. The presence of natural resources such as coal and iron stimulated the manufacturing growth. Between 1880 and 1887 ninety-seven new factories were built in Knoxville. These included iron mills, machine shops that manufactured iron products, cloth mills, furniture and shoe factories, and coal and marble extraction industries. The value of goods manufactured in the city rose from $923,211 in 1870 to $6,201,840 in 1899.[6]

Knoxville's population grew as the commercial and manufacturing sectors grew. In 1860 the city had a population count of 3,704, and

---

[4]Michael J. McDonald and William Bruce Wheeler, Knoxville, Tennessee: Continuity and Change in an Appalachian City (Knoxville: The University of Tennessee Press, 1983), 3-9.

[5]Ibid., 18.

[6]Ibid., 21-22.

by the end of thirty years of economic success, the population had risen to 32,637. In addition, the city had expanded its land area by annexing growing communities on its fringes; the Mechanicsville area in 1883 and the Fort Sanders area in 1898.[7]

Economic growth, however, did not last. Knoxville suffered from the depression like any other American city, but it prospered little from the war activity in the early 1940s. Smaller cities in the Knoxville metropolitan area had more success; these being Alcoa with its aluminum industry important to the war effort, and Oak Ridge, the base for the Manhatten Project.

After World War II Knoxville also failed to participate in postwar prosperity. The city was beginning to feel the effects of suburbanization, the decline of retail activity in the central business district, and the loss of industry due to the aging of production equipment and new technology. The only industry to gain in employees was the "needle" trade which employed primarily women at low wages.

With the economic decline per capita income was slow to grow. From 1950 to 1960 the real per capita income in Knox County grew only 9.1 percent, a growth rate behind that of Chattanooga, Nashville, the state, and the southeast region.[8] The city population also declined in this ten year period from 124,183 to 111,800. In the Knox County Area outside the city's limits lived 138,700 people.[9]

---

[7] Ibid., 24.

[8] Ibid., 99.

[9] Ibid., 103.

By the 1960s Knoxville, like many of the nation's cities, was the victim of suburbanization, automobility, and downtown decay. Job opportunities were declining relative to the population, and the existing housing stock was deteriorating daily as the middle-income families moved to suburban county fringes leaving behind a city populated by the poor, the aged, and minorities.[10]

Political efforts to consolidate city-county governments failed, and annexation was seldom tried even though annexation laws had not yet been amended to make annexation more difficult. The elected legislative and executive trustees of city government feared the necessity for higher taxes if urban services had to be extended beyond existing boundaries.

In fact, holding the line on taxes has always been a popular stand for Knoxville politicians from Councilman Lee Monday in the 1920s and 1930s to Councilwoman Jean Teague in the 1980s. The desire to keep taxes low and still provide basic city services has created for Knoxvillians a high per capita net indebtedness. In 1930 the cost to run the city government was among the highest in the state even though Knoxville was not the largest municipality, and per capita indebtedness was twice that of any other Tennessee city.[11]

Today Knoxville appears to be a city suffering from urban decline and fiscal stress. In 1984 when the city's budget was being considered by City Council, a fight developed between the mayor and council

---

[10] Ibid., 129-133.

[11] Ibid., 48.

over the amount to increase property taxes. As a consequence, no tax increase was enacted and city employee pay raises and most capital improvements were deleted from the budget which was adopted. Whether this was a single political struggle between mayor and council or symptomatic of a condition or urban decline and fiscal stress is the subject of this study.

Study Limitations

This study on infrastructure disinvestment will be confined to one city and the findings may be peculiar to this one city. The same historical circumstances may not exist elsewhere. The city of Knoxville was selected because it is the city in which this research lives, works, and studies, and the information required to complete the study is convenient. The city, however, is an old city in terms of the research on aging of cities, and it does exhibit symptoms of urban decline and fiscal stress.

Disadvantages and limitations which will be attributed to a case study, such as inability to generalize, have been mitigated by the use of a model of infrastructure disinvestment which has defined the parameters of the study at the outset. This model is capable of being replicated in another urban central city.

In developing a model it is necessary to exclude a large part of the universe of variables which exist. The theoretical approach to the study defines the selection of variables. The variables or indicators which have been selected to define urban decline and fiscal stress are

also selected from among many indicators which have been used by urban scholars as well as governmental agencies concerned with urban affairs.

The selection of variables was made on the basis of reading the research which has been done using indicators, and selecting those which researchers have found to be adequate or significant measures to describe and define the two constructs of urban decline and fiscal stress. The effort has been made to use valid indices within the limitations of the data available. This research and subsequent research by others using this model may add to or subtract from the validity of the indicators and the model itself, but it is not within the purview of this study to test the validity of the selected indicators convergently or for criterion validity.

CHAPTER IV

AN EMPIRICAL ANALYSIS OF THE COMPONENTS OF THE MODEL

Budget decisions by policy makers to invest or not invest in a city's urban infrastructure are made within the context of the city's environmental needs which are generated by its physical, economic, and population characteristics, and the financial context which consists of the city's current debt, expenses, revenues, and revenue resources. In this study the environmental and financial contexts are analyzed in terms of the constructs of urban decline and fiscal stress. Research by economists and urban scholars on urban decline and fiscal stress have provided a framework of indices which characterize these conditions. In the study urban decline and fiscal stress have been linked in a model of infrastructure disinvestment. The components of the model have been operationalized in terms which are measurable and for which data are available. This chapter analyzes the data which characterize the components of the infrastructure disinvestment model gathered from the Knoxville case study. Urban decline and fiscal stress are conditions which do not occur in a one or two year time span but are conditions which result from years of public and private decisions. For this reason the data are longitudinal, covering a twenty-two year period.

The first part of the chapter examines the factors associated with the urban decline component. The financial environment of the city,

together with intergovernmental aid, are analyzed in the second section. In a third section an intercity comparison is made of Knoxville with twenty southeastern cities using factors associated with urban decline and fiscal stress. These two components provide the context for analysis of budget decisions by city officials which result in investment or disinvestment in the city's infrastructure. This later part of the model, budget decisions, particularly those regarding taxing, spending, and the infrastructure of the city, are examined in Chapters V and VI.

Urban Decline Component

This component of the infrastructure disinvestment model is based on changes in the structural, demographic, and economic factors particular to the city. The city which is declining has often failed to ameliorate its aging process by capturing the growth occurring in the surrounding county of SMSA, or it is declining along with the county, the SMSA, and the region as is the case of many northeastern cities.

Negative changes in population, employment, and per capita real income were used as measures of decline by Bradbury, Downs, and Small.[1] Muller found declining cities have an aging housing stock, and were losing, or not gaining, households which were young, educated, and with higher incomes when compared to households which remained in the declining cities.[2] Nathan and Adams used employment,

---

[1]Bradbury, 4.

[2]Muller, 8, 25.

dependency, education, income, housing, and poverty as measures of city hardship when compared to the surrounding SMSA.[3] Howell and Stamm used a mix of structural, economic, and social conditions to characterize cities as growing or declining, and to relate these conditions to municipal financial performance.[4] Measures which were significant in these studies are used here to identify Knoxville's environment as one of growth or decline, and, when appropriate, the measures will be compared with indices for the county where there has been growth.

Local Environment

Structure

The structural factors of the local environment are square miles within the city's boundaries, the density of the city population, and the age composition of the housing stock. These factors are presented separate from demographic factors, but the city's boundaries certainly affect the demographics of the city, just as a city's limits affect the economic factors of the city's environment. The separation is for topical convenience, but all of these factors are combined in the urban decline component.

Norton found that success or nonsuccess in the expansion of a city's incorporated boundaries shaped real growth of the city. The

---

[3]Nathan, 47.

[4]Howell, 59-61.

greater a city's annexation power, the greater its protection from the cycle of flight of the tax base to the suburbs, upward pressure on city tax rates, and erosion of the city's taxable resources. Declining cities are frozen within boundaries which aggravate already weak competitive positions vis-à-vis surrounding suburbs, while growing cities, through annexation, preempt the organization of competitive tax enclaves beyond municipal borders.[5]

In assessing the capacity of Knoxville to capture residential and commercial growth which has occurred around it, this section analyzes the expansion of the city's boundaries, population density per square mile, and the age of its housing stock.

Prior to 1955 neither Tennessee municipalities nor their residents could initiate annexation proceedings. Annexation had to be accomplished through local legislation passed by the state legislature. Annexation legislation passed in 1955 by the Tennessee General Assembly empowered the governing body of a city to annex territory by ordinance, after notice and a public hearing. Annexation could also be initiated by petition of residents in the municipality or residents of the area to be annexed.[6] Wheeler has ranked the extant annexation law for Tennessee municipalities as "easy," thus it does not operate as a legal constraint on expansion of a city's incorporated

---

[5]Norton, 94.

[6]Victor C. Hobday, Annexation Handbook for Cities and Towns in Tennessee (Knoxville: University of Tennessee, Bureau of Public Administration, 1969), 5.

boundaries.[7] The politics of annexation and the need and ability to extend urban services to unincorporated areas are probably more important in determining the success of annexation initiatives in Knoxville. The politics of annexation is not the subject of this study; however, annexation of additional territory with taxable property and population is used as an indicator, thus it is important to determine whether the annexation law of the state has been a significant factor in expansion or nonexpansion of the city's boundaries during the period under study.

During the study period of twenty-two years, a period of rapid suburbanization, Knoxville expanded significantly its boundaries only once to incorporate the growing western regions of Knoxville and the Fountain City area. The territory annexed in 1962 consisted of 51.3 square miles and increased the city's population by 30 percent with 56,138 new residents. The annexation, as shown in Table IV-1, increased the city's population but decreased the density of the city since much of the new area consisted of new residential housing on large suburban lots and large undeveloped areas in the western area. Annexation also helped to decrease dramatically the percent of older housing in the city which had been and was in the process of being torn down for urban renewal projects and the interstate highway system which skirted the inner city. Annexation shifted housing from predominantly renter-occupied in 1960 to owner-occupied in 1970, but

---

[7] Raymond H. Wheeler, "Annexation Law and Annexation Success," Land Economics, 41 (November 1965), 356.

TABLE IV-1

KNOXVILLE: AREA, ANNEXATION, AND DENSITY

Year	Area (Sq. Mi.)	Area Change (Percent)	Density (Sq. Mi.)
1960	25.4		4,403
1970	77.0	203.1	2,267
1980	77.6	.8	2,256

Source: U.S. Department of Commerce, Bureau of the Census, Characteristics of the Population: Tennessee for the years cited.

the percent of owner-occupied housing has decreased in Knoxville since the 1970 census, as seen in Table IV-2. The value of property assessed in Knoxville after annexation increased by 52 percent thus enabling the city to reduce its property tax rate from $3.10 per hundred dollars of value in 1962 to $2.85 in 1963.

TABLE IV-2

KNOXVILLE: HOUSING UNITS BUILT BEFORE 1939 AND OWNER-OCCUPIED UNITS

Year	Total Housing	Older Housing	Percent of Total	Percent Owner-Occupied
1960	36,759	26,335	72	49.8
1970	61,042	22,561	37	53.6
1980	68,574	14,859	22	51.1

Sources: U.S. Department of Commerce, Bureau of Census, Census of Housing, 1960; Census of Population and Housing: Census Tracts Knoxville, Tn., SMSA and Adjacent AReas, 1970; and Census of Housing, Metropolitan Housing, Characteristics, Knoxville, Tn., 1980.

Since 1962 annexation has occurred mostly along major thoroughfares to incorporate commercial development for the purposes of providing sewer, water, police, and fire protection. Extensive new residential development west of the city's limits have remained unannexed. Annexation attempts which have been made after the population growth occurred outside the city's boundaries have failed when put before the voters. In most of the new areas water and sewer services are provided by two independent public utilities which were created after the passage of enabling legislation in 1957, and fire protection is provided by a private fire-fighting company.

The growth of the county's population outside the city's boundaries and the lack of expansion of the city's legal limits have had an impact on the demographics of the city. These aspects are covered in the following section.

Demographics

Table IV-3 shows the growth and decline of Knoxville population since 1910. The 1917 annexation of 22 square miles, which included Sequoyah Hills, South Knoxville, Oakwood, Park City, Burlington, Mountain View, and Lonsdale, more than doubled the city's population for the 1920 census. The city's population, which constituted 68 percent of Knox County's inhabitants, continued to increase through the 1930 census, but the city population grew only 5.46 percent by 1940. When adjusted for the 5,100 University of Tennessee students who were counted for the first time in the 1950 census, the city growth

TABLE IV-3

KNOXVILLE: POPULATION GROWTH, 1910-1980

Year	Population	Percentage Change
1910	36,346	
1920	77,818	114.10
1930	105,802	35.96
1940	111,580	5.46
1950	124,769	11.82
1960	111,827	-10.37
1970	174,587	56.12
1980	175,045	.25

Source: U.S. Department of Commerce, Bureau of the Census, Number of Inhabitants: Tennessee; Characteristics of the Population for the years cited.

was only 7 percent from 1940 to 1950. During the next ten years the city's population declined.

In the remainder of the county, Table IV-4, the population was increasing until 55 percent of Knox County's inhabitants lived outside Knoxville's city limits in 1960. The 1962 annexation increased the city's population at the expense of the remainder of the county, but by the 1980 census, the city population was barely increasing while the remainder of the county grew rapidly. The 1984 Bureau of Census estimate has 53 percent of the county's population living outside of Knoxville's city limits.

Over the twenty years covered by the 1960 to 1980 censuses, the population growth within the city had changed in its composition of minorities and dependent population. Prior to the 1962 annexation of

TABLE IV-4

KNOXVILLE AND KNOX COUNTY: POPULATION GROWTH, 1930-1980

Year	Knoxville	Percentage Change	Remainder of Knox County	Percentage Change
1930	105,802		50,100	
1940	111,580	5.46	66,888	33.50
1950	124,769	11.82	98,238	46.87
1960	111,827	-10.37	138,696	41.18
1970	174,587	56.12	101,706	-26.67
1980	175,045	.25	144,649	42.22

Source: U.S. Department of Commerce, Bureau of the Census, Characteristics of the Population: Tennessee for the years cited.

Fountain City and west Knoxville which were almost exclusively white, the minority population in Knoxville was 18.7 percent. Annexation decreased the percent of minorities living in the city even though the total numbers increased. By 1980 the minority percent had increased to 15.3 percent of the total population.

The age composition of an area's population has been used in some urban policy studies as an indicator of the urban condition. Economic studies concentrate on the age profile of a city as a correlate for job opportunities in the city economy.[8] Age profiles are divided into the working age group, comprised of the population between 18 and 65 years of age, and the dependency group which is composed of

[8]Hammer and Company, Associates, The Economy of Metropolitan Knoxville (Washington, D.C.: Hammer and Company, Associates, November 1962), 43.

the young (under 18 years) and the old (over 65 years). The rationale for concentrating on productive and dependent age groups is that the production and earnings of the working age population must generate the support needed by the dependent group for a variety of public programs including education, health, and welfare.[9]

In 1960 the dependent population in Knoxville constituted 41 percent of the total population (Table IV-5). This group increased to 42 percent of the total in 1970, but in the 1980 census the dependency group comprised only 38 percent of the population. Within the dependency group, however, there has been a change which is significant for public programs. The young dependent group has decreased

TABLE IV-5

KNOXVILLE: POPULATION CHARACTERISTICS, 1960-1980

Characteristics	1960	1970	1980
Total Population	111,827	174,587	175,045
Minority Population	20,886	22,817	26,792
Percent Minority	18.7	13.1	15.3
Population Under 18	35,674	54,360	42,525
Percent Young	31.9	31.1	24.3
Population Over 65	10,609	19,270	24,172
Percent Old	9.5	11.0	13.8

Source: U.S. Department of Commerce, Bureau of the Census, Characteristics of the Population: Tennessee for the years cited.

[9]Government Finance Research Center of the Municipal Finance Officers Association, Indicators, III-38.

as a percent of the total population. This is typical for a city where there has been a flight of young, middle-income families to the outer suburbs, and this fact should have implications for public decisions on education, especially the decision to continue to operate certain schools in the city which are not filled to capacity.

The dependent group over 65 years has increased in numbers and as a percent of the total population over the period from 1960 to 1980, but the working age group has remained the majority group in Knoxville over this period. The job opportunities for this working age group and the economy of the city are examined in the following section.

Economic

The Knoxville urban area, consisting of the city and its close-in unincorporated suburbs, contain the main concentration of enterprises making up the metropolitan economy. The economy is integrated; containing enterprises which produce goods and provide services. At the beginning of the period under study, manufacturing accounted for the largest fraction of total employment, employing nearly five out of ten city residents with jobs in 1963, and the manufacturing jobs were concentrated in the city. By the end of the period, manufacturing jobs in the city had decreased by 11 percent, employing roughly one out of every five city residents holding jobs in 1982. By this time retail had replaced manufacturing as the largest employer with three out of every ten city residents employed in retail sales.

The decline of manufacturing in Knoxville, which started in the post-World War II period, was not typical for the state or region. A comparison of the rates of change in nonfarm employment for the United States, the southeastern region, Tennessee, and Knoxville between 1951 and 1960 is shown in Table IV-6. The Knoxville economy did not participate in the rapid growth of the industrial sector of the economy which occurred in the southeast after World War II.[10] A possible explanation for this phenomena is that Knoxville experienced the bulk of its industrial expansion prior to World War II, and thus was following a pattern of development typical of aging urban industrial centers in which a shift occurs from dependence on goods-producing to service-producing industries. Table IV-7 shows the absolute loss in

TABLE IV-6

SUMMARY COMPARISON OF RATES OF CHANGE IN NONFARM EMPLOYMENT, 1951-1960

	Goods-Producing Industries	Service-Producing Industries	All Nonfarm Industries
Knoxville	-5.3	10.1	2.6
Tennessee	11.9	20.1	16.8
Southeast	9.8	22.8	17.2
United States	2.1	21.7	13.6

Source: Hammer and Company Associates, The Economy of Metropolitan Knoxville (Washington, D.C., November 1962), 19.

[10] Hammer and Company, Associates, 19.

TABLE IV-7

PERCENT CHANGE IN KNOXVILLE'S EMPLOYMENT IN MANUFACTURING TRADES AND SERVICES, 1963-1982

Manufacturing	Trades	Services
-11	70	232

Sources: U.S. Department of Commerce; Bureau of Census, Census of Manufacturers: Area Statistics; Census of Retail Trade: Area Statistics; Census of Service Industries: Geographical Area Statistics; Census of Wholesale Trade: Area Statistics for the years cited.

manufacturing employment from 1963 to 1982 and the employment gains in the trade and service sectors.

The loss of manufacturing employment in the city was being offset by an increase in manufacturing sector jobs in the remainder of Knox County. From 1963 to 1982, 2,310 less people were being employed by city manufacturing establishments, but 3,421 manufacturing jobs were created in the remaining areas of Knox County. Table IV-8 shows manufacturing employment in Knoxville and the remainder of Knox County from 1963 to 1982, and the percentage change in employment in the manufacturing sectors for these two areas. Rapid gains in employment in the trades and service industries had also occurred in the Knox County area outside the city by the close of the study period as also shown in Table IV-8.

A service-producing economy like Knoxville's is dependent upon mass consumer buying, and its growth is tied to increases in personal

TABLE IV-8

COMPARISON OF EMPLOYMENT IN MANUFACTURING, TRADES, AND SERVICE INDUSTRIES IN KNOXVILLE AND REMAINDER OF KNOX COUNTY, 1963-1982

Sector and Year	Knoxville		Remainder of Knox County	
	Number of Employees	Percent Change	Number of Employees	Percent Change
Manufacturing				
1963	20,210		1,579	
1967	23,900	18.26	1,600	1.33
1972	23,600	-1.25	2,700	68.75
1976	20,300	-13.98	3,200	18.51
1982	17,900	-11.82	5,000	56.25
Retail Trade				
1963	11,272		2,059	
1967	12,793	13.49	1,755	-14.76
1972	15,954	24.70	1,532	-12.71
1976	19,078	19.60	2,527	64.90
1982	21,302	11.70	4,571	80.90
Wholesale Trade				
1963	6,381		177	
1967	7,418	16.25	198	11.86
1972	7,789	5.00	966	387.88
1976	8,984	15.30	1,002	3.70
1982	8,643	-3.80	2,771	176.50
Service Industry				
1963	4,405		271	
1967	5,585	26.78	169	37.64
1972	6,788	21.54	468	176.92
1976	8,772	28.50	876	87.20
1982	14,642	67.90	3,968	353.00

Sources: U.S. Department of Commerce, Bureau of Census, Census of Manufacturing: Area Statistics; Census of Retail Trade: Area Statistics; Census of Service Industries: Geographic Area Statistics; Census of Wholesale Trade: Area Statistics for the years cited.

income of the consumer and continued demand for services.[11] The sections which follow look at the position of Knoxville's residents in the economic environment.

Per Capita Income. Per capita and family income levels are both results and causes of economic development. On the other hand, sluggish growth in income occurs when an economic community is declining. Per capita income is the best measure available to determine the ability of persons to meet their needs through private spending and to provide for local public programs. It measures financial capacity in the aggregate with no recognition of income distribution differences. It also measures the financial capacity of a community whether or not the total resources of persons in a city are actually used to support spending for the benefit of all.[12]

Per capita income in Knoxville, when adjusted for inflation by using 1972 real dollars, has increased 45 percent over the twenty year period from 1960 to 1980, but it increased by only 4.6 percent the last ten years of that period. This slow growth of per capita income from 1970 to 1980 differs markedly from per capita income figures for Knox County, the SMSA, and Tennessee as shown in Table IV-9. Per capita income over the same ten year period for these jurisdictions averaged a 32 percent increase.

---

[11] Ibid., 25.

[12] Government Finance Research Center of the Municipal Finance Officers Association, Indicators, III-54.

TABLE IV-9

PER CAPITA REAL INCOME IN KNOXVILLE, KNOX COUNTY, SMSA AND TENNESSEE, 1960-1980

	Knoxville		Knox County		SMSA		Tennessee	
Year	Per Capita Income	Percent Change	Per Capita Income	Percent Change	Per Capita Income	Percent Change	Per Capita Income	Percent Change
1960	$2,493		$2,664		$2,566		$2,293	
1970	3,450	38.4	3,546	33.1	3,500	36.4	3,409	48.7
1980	3,607	4.6	4,775	34.7	4,733	35.2	4,289	25.8

Source: U.S. Department of Commerce, Bureau of Census, Census of Population and Housing: Census Tracts, Knoxville, Tennessee for the years cited and University of Tennessee, Center for Business and Economic Research, College of Business Administration, Tennessee Statistical Abstract, 1983/84, 1980 and 1968.

Although statistics are not available for per capita income in the Knox County area outside of Knoxville's limits, it is reasonable to assume from the Knox County figures that the per capita income would be higher than that of city residents. This follows Norton's theory that the life-cycle growth patterns of cities have both economic as well as political sources; that city-suburban social cleavages are more pronounced in the old industrial areas than in young cities. Norton found that average income for city residents in 1974 fell sharply below those of suburban households in old areas--but not in young cities. Instead, young cities tended to have average incomes that equal or exceed those of suburban households.[13] The political basis of the differences is that the boundaries of the old cities have been frozen.

Per capita income in Knoxville grew 38.4 percent from 1960 to 1970, the period during which Knoxville annexed a large portion of

[13]Norton, 21.

developed suburban areas. In the next ten years, when annexation amounted to less than a square mile, the per capita income of the city barely increased while the county's per capita income grew by 34.7 percent.

Muller found the same relationship between areas and above average gains in personal income. Cities which capture the growth around them increase the cost of providing public services but the gains in personal income increase their ability to pay for public services. If high employment rates can be maintained, a fiscal balance can result without necessarily increasing tax burdens.[14] How well Knoxville has maintained employment opportunities for its residents is the subject examined in the following section.

Employment. Though this section is entitled employment and seeks to describe job opportunities available to Knoxville residents, unemployment is the statistic which is examined. Unemployment, as a measure, includes those in the civilian labor force who have lost jobs and are looking for other work, and those who are looking for work for the first time. It is probably the best single statistic of the hardship associated with not being able to find work in the community where one resides.[15]

---

[14]Muller, 12-13.

[15]Government Finance Research Center of the Municipal Finance Officers Association, Indicators, III-55.

Knoxville metropolitan area was a place of chronic unemployment from 1951 to 1960. Over this period unemployment averaged 6.5 percent of the civilian labor force while the average unemployment rate in the United States as a whole over the same period was about 4.6 percent.[16] In 1960 the unemployed labor force in the city amounted to 6.68 percent. In that year there were 44,786 people comprising the labor force. Over the twenty-two year period covered by this study, the labor force increased by 86 percent; the unemployment in the labor force had increased by 174 percent.

On the other hand, using a measure of economic opportunity developed by dividing employment by population at different points in time, it is possible to determine whether the ratio of employment to population has increased or decreased. The employment ratio reveals that job opportunities have increased for Knoxville residents. In 1960 the employment ratio was 37 percent of the population and in the next decade it increased only one point, but by 1980 the employment ratio was 43 percent. These figures are displayed in Table IV-10. Since the increase in employment has been service sector jobs it is reasonable to assume that the increase in job opportunities has been in this sector where wages are lower than in the traditional manufacturing sector where jobs have declined. Have increased employment opportunities been able to decrease the number of Knoxville residents who live in poverty? The number of residents counted in the poverty statistics is considered in the next section.

---

[16]Hammer and Company, Associates, 61.

TABLE IV-10

UNEMPLOYMENT AND EMPLOYMENT OPPORTUNITIES IN KNOXVILLE, 1960-1980

Year	Population	Civilian Labor Force	Employed	Unemployed	Percentage Unemployed	Ratio of Employed to Population
1960	111,827	44,786	41,792	2,990	6.7	37
1970	174,587	68,927	66,249	2,678	3.9	38
1980	175,045	80,405	74,746	5,659	7.0	43

Source: U.S. Department of Commerce, Bureau of Census, Census of Population and Housing: Census Tracts, Knoxville, Tennessee, SMSA, and Adjacent Areas for the years cited.

Poverty Status. Poverty statistics presented in the U.S. Census reports are based on a definition originated by the Social Security Administration in 1964 and subsequently modified by federal interagency committees in 1969 and 1980. For this reason, poverty statistics are used for 1970 and 1980 only. In Knoxville the number of people who live in poverty increased slightly from 1970 to 1980, but as a percent of the population there was no change. When compared to the remainder of Knox County, Table IV-11, it is clear that the poorest residents in the county reside in the city. Susan Ambler, who prepared a report on poverty in the area for the Knoxville-Knox County Community Action Committee, reached this same conclusion. "More people who are moving from other places appear to be moving into the county rather than the city, and those people are likely to be middle-income or better, not poor people."[17]

[17]"Most Knox Poverty in City, Study Says," Knoxville News-Sentinel, 23 May 1985, sec. 1A, 6.

TABLE IV-11

PERSONS BELOW POVERTY LEVEL IN KNOXVILLE AND KNOX COUNTY, 1970 and 1980

	Knoxville		Balance of Knox County		Total Knox County	
Year	Percent of Total Population	Number in Population	Percent of Total Population	Number in Population	Percent of Total Population	Number in Population
1970	19.6	32,104	14.5	14,618	17.7	46,722
1980	19.6	32,191	9.1	13,152	14.7	45,343

Sources: U.S. Department of Commerce, Bureau of Census, Census of Population and Housing: Census Tracts, 1970, and University of Tennessee, Center for Business and Economic Research, College of Business Administration, Tennessee Statistical Abstract, 1983/84.

Summary on the Data and Propositions

The lengthy propositions on the local environment presented in Chapter III are combined and stated in Proposition IV. This proposition is restated below:

> A city is suffering from urban decline when it fails to expand and incorporate into its jurisdiction unincorporated developing residential and commercial areas on its fringes in order to "capture" these taxable resources and reduce the aging process of its own area. The condition is exacerbated by the loss of employment opportunities in the city and the loss of the city's productive population coupled with an increasing dependent population. These conditions create demands for services which the city is less able to afford.

How does the data presented for Knoxville fit with this proposition?

Knoxville was a growing city up to the mid-1950s, the beginning of the era of suburbanization. In 1960 the city registered a 10 percent decline in population. The 1962 annexation of suburban development expanded the territory, population, and taxable resources of the city. Annexation, however, virtually ended at this time, and the city started again on a cycle of decline. The 1962 annexation transformed

the city's housing composition in favor of newer owner-occupied structures. In recent years, however, the percent of owner-occupied units is again decreasing, signaling the abandonment of the city by young middle-class homeowners.

The composition of the population also signals abandonment of the city by the middle-class family and the city's failure to expand its boundaries to capture the flight. The minority population is again increasing as a percent of the total population after the percentage declined with the 1963 annexation. The city's population of persons over 65 years of age had increased steadily from 1960 to 1980, and those under 18 years of age have declined steadily over the same period. When population statistics are compared to the total county, the city is the residence of the county's minority and aging population.

The city, once the center for manufacturing jobs, has lost employment opportunities in this sector to areas outside the city. Its gains in employment have been confined exclusively to trade and service sector jobs which are traditionally less renumerative than manufacturing occupations. The per capita income of the residents has increased but not at the same rate as per capita income for the county. In fact, the 4.6 percent growth of city per capita real income from 1970 to 1980 is even more striking when compared to the 34.7 percent growth for the county as a whole.

From most of the measurable indicators, Knoxville is a declining city. It began the downward spiral in the 1960s, but was able to

reverse the declining trend only after extensive annexation in 1962. The effects of this annexation are evident in the 1970 data, but by the next census report the 1980 data suggest that the city is again experiencing conditions typical of urban decline. Have these conditions had an effect on the fiscal position of the city by creating a demand for services which the city finds difficult to finance with resources which are available to it? This question is examined in the following section on the financial performance of the city analyzed within the context of fiscal stress. Ultimately, we move to the question of the effects of urban decline and fiscal stress on budget decisions to invest or disinvest in the city's aging infrastructure and capital assets.

The Fiscal Stress Component

Fiscal stress is an imbalance between financial capacity and the demand for public goods and services. Fiscal stress arises when a city cannot sustain its services with the revenues available to it. Levine defined fiscal stress as

> . . . [the] gap between the needs and expectations of citizens and government employees for government services and benefits and the inability of the economy to generate enough economic growth to expand or even sustain, in some places, tax-supported programs without putting unacceptable demands on taxpayers. . . .[18]

Fiscal stress is not a condition which arises in a city overnight, but it is a combination of the decline of economic conditions in a city

---

[18]Charles H. Levine, "The New Crisis in the Public Sector," in Managing Fiscal Stress: The Crisis in the Public Sector, ed. Charles H. Levine (Chatham, N.J.: Chatham House Publishers, Inc., 1980), 4.

and the accumulation of past decisions by city policymakers over a number of years. Cities are in fiscal trouble because of static or declining populations and economic bases, rising costs of services due to inflation and personnel demands, lagging growth in revenues, and expedient, indifferent fiscal management on the part of local governments.[19]

To be more descriptive, as cities decline pressures are exerted on both the revenue and expenditure side of the municipal budget. In an economic sense, private disinvestment in manufacturing, commercial and housing enterprises in the city erode into revenue-generating capacity. In social terms, as the better-off middle class families decide not to reside in the city it becomes the residence of a large dependent population with demands for social services which are associated with public employment increases. The city, however, still remains as the place for employment for many people who drive into work, use the city's facilities, and expect the protection of the city's public safety personnel. The pressures on municipal outlays are further compounded by the need to encourage private reinvestment through enhanced municipal services and public facilities. With expenditures mounting concurrently with shrinkages in locally raised revenues acute fiscal strains emerge from the declining city.

---

[19]David T. Stanley. "Cities in Trouble," in Managing Fiscal Stress: The Crisis in the Public Sector, ed. Charles H. Levine (Chatham, N.J.: Chatham House Publishers, Inc., 1980), 102.

Municipal Finance Elements

In this study a proposition of fiscal stress has been advanced: when city expenses increase and taxes and debt are increasing to cover these costs, while at the same time the city's capacity to increase own-source revenues is declining, an imbalance occurs between financial capacity and the demand for city expenditures.

In order to test this proposition certain municipal finance elements composed of revenue, debt, and expenses are examined over a twenty-two year period of time to observe trends in the costs of services delivered, how the costs have changed among various services, and how taxes and other own-source revenues have been adjusted to pay for the city services. The municipal finance components of revenue, debt, and expenses are framed for analysis in propositions stated in Chapter III.

Revenue Element

Knoxville's general fund finances the majority of nondiscretionary municipal services such as police and fire protection, garbage pickup, street cleaning, recreation, and debt service. General fund revenues are derived from five sources: property and other taxes, shared taxes from the state, license and permit revenues, fines and forfeitures, and sales and charges for services. The property tax is the single largest source of general fund revenues, accounting for greater than 50 percent of the total. The second largest source of revenues for the general fund comes from state shared taxes. During the period under study there have been few new sources of revenue for

the city's general fund. Federal general revenue sharing money is the only substantial new source of money for general city operations, but this revenue is examined separately in the section of the intergovernmental revenue component.

Changes in a city's property tax base are central to its financial performance. The value of taxable property reflects the local economy and provides a good indication of the fiscal health of a city. In declining cities, private disinvestment has combined with political fragmentation or frozen boundaries to bring about a prolonged decline of taxable assets. When growing suburban communities remain outside the jurisdiction of the inner core city, as has been the case in declining cities, it becomes necessary to squeeze considerable amounts of revenue out of the faltering local economy in order to keep up with expenditures.

Figure IV-1 details percentage changes in the nominal assessed value of property in Knoxville for the twenty-two year period from 1960 to 1982. Figure IV-2 displays percentage changes in property valuations for the same period in 1972 dollars in order to show actual change and the effect of inflation.

From 1960 to 1982 the overall average increase in the nominal value of taxable property was 4.42 percent. The largest increase in value occurred with the addition of annexed property to the city's tax roll in 1963. The 1971 increase resulted from reevaluation of property, but this increase is followed by an 18.84 percent decline, primarily the result of successful property assessment appeals. In real

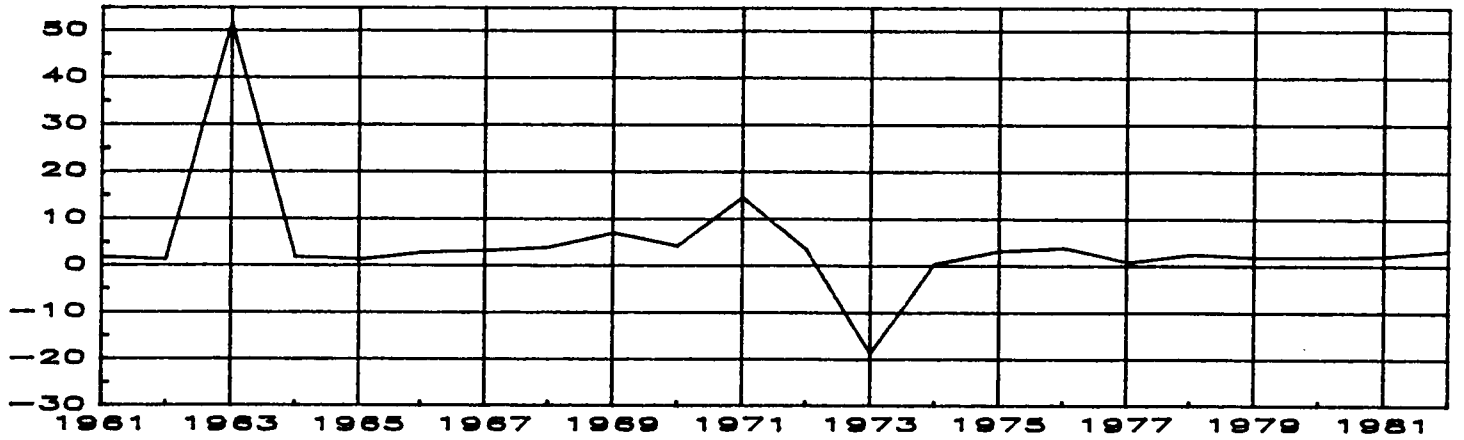


FIGURE IV-1. THE PERCENT CHANGE IN NOMINAL ASSESSED VALUE OF PROPERTY TAXED.

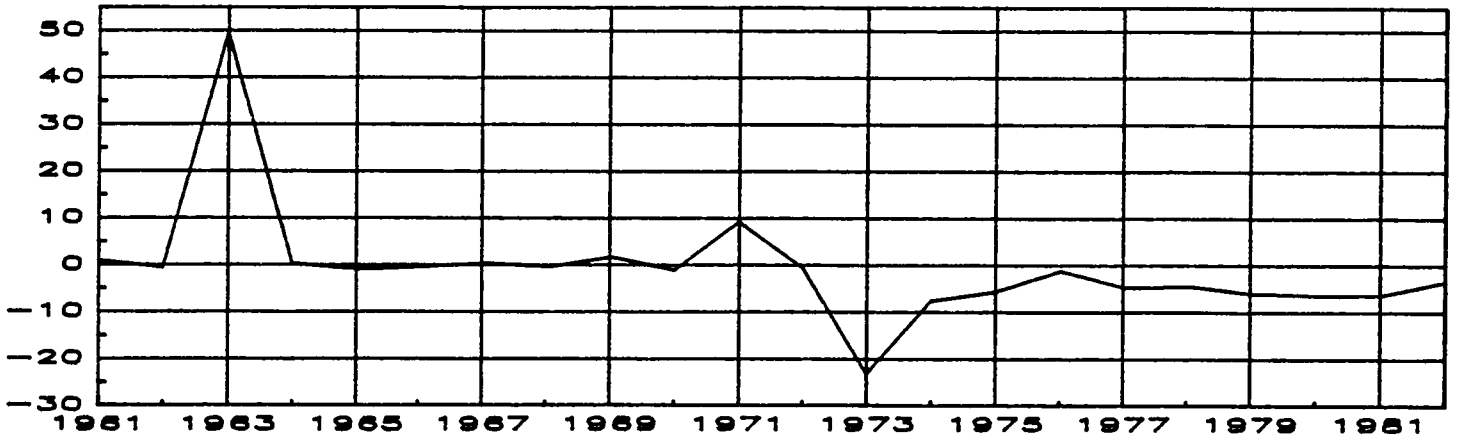


FIGURE IV-2. THE PERCENT CHANGE IN REAL ASSESSED VALUE OF PROPERTY TAXED.

terms, property values decreased by an overall average of .58 percent from 1960 to 1982. The only substantial increases in taxable property occurring in 1963, after annexation, and after the 1971 property re-evaluation.

Figure IV-3 depicts the annual percentage increases or decreases in the assessed nominal value of taxed property and the nominal tax revenues realized by the general fund. Years in which property taxes were increased are marked with an asterisk. Since the tax revenues are increasing at double the percentage increase in the assessed value of property the city relies upon property tax rate increases to raise needed revenues. On a per capita basis, the ratio of local taxes collected to assessed value of property was 3.19 in 1960. In 1970 the ratio was 3.23, but by the end of the next decade the ratio was 6.35, a 99 percent increase in twenty years.

Shared state taxes, the second largest source of revenues for the general fund, are derived from the city's share of the state sales tax, the Knox County sales tax, the Tennessee shared income tax, Tennessee shared beer and alcoholic beverage taxes, and TVA payments-in-lieu of taxes. These revenues exclude the city's share of state gasoline tax which is earmarked for state street repairs, used by a special fund, and treated in this study under a separate topic. The state shared taxes reported in the city's general fund are listed in Table IV-12, along with the percentage distribution.

State shared taxes have increased at a greater rate than local property taxes and as a percent of total general fund revenues for

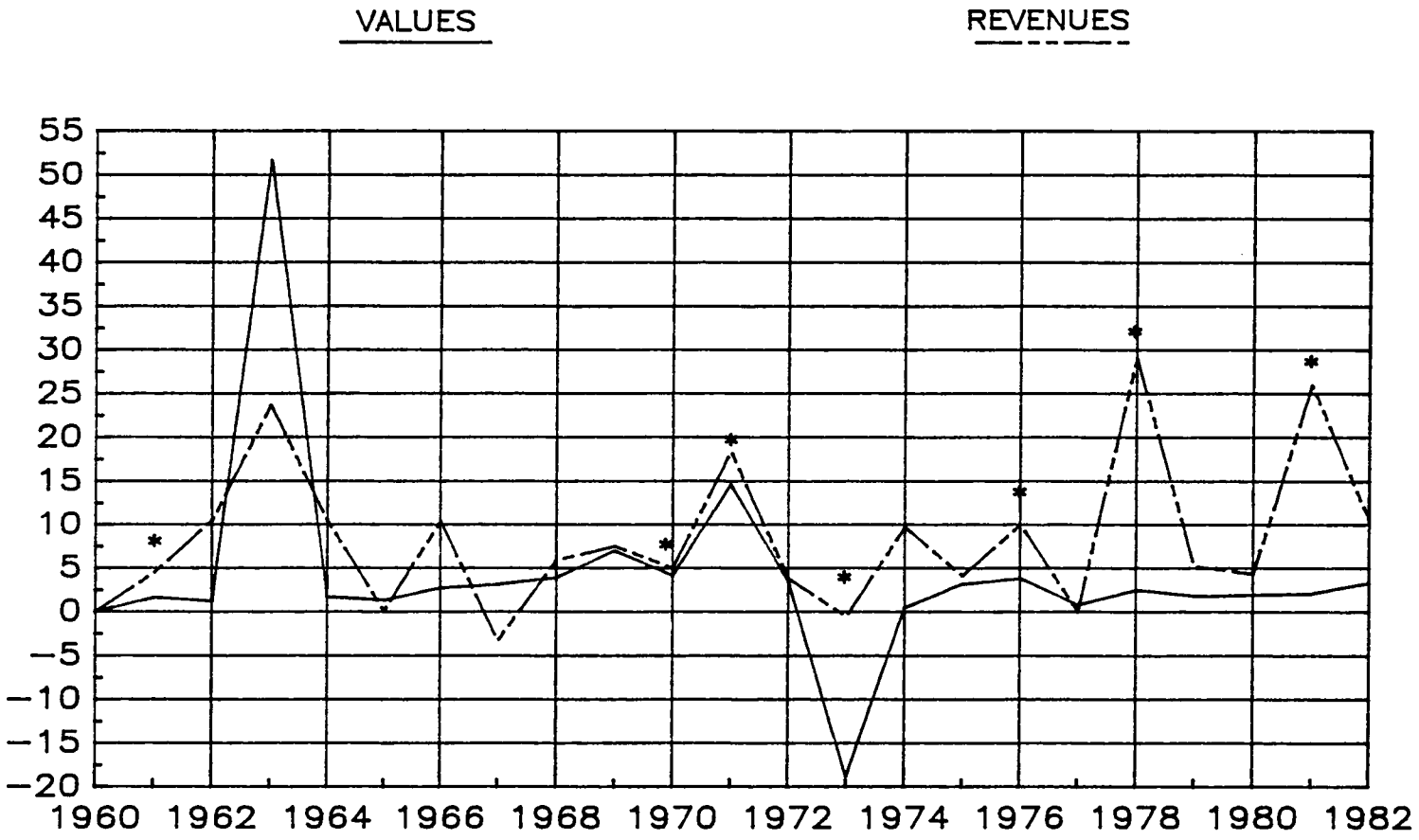


FIGURE IV-3. COMPARISON OF PERCENT CHANGE IN NOMINAL VALUE OF PROPERTY TAXED AND NOMINAL PROPERTY TAX REVENUES.

TABLE IV-12

STATE SHARED TAXES

Shared Taxes	Percentage Distribution		
	State	City	County
Alcohol Beverage	82.50	-	17.50
Beer Tax	76.40	11.76	11.76
Mixed Drink	51.92	31.02	17.06
Income	68.24	24.56	7.20
Sales	94.40	5.60	-
TVA Payments-in-lieu of Taxes	72.05	7.52	20.43

Source: Harry A. Green, Local Government Finance in Tennessee (Nashville: The Tennessee Advisory Commission on Intergovernmental Relations, 1982), 73.

Knoxville. The increases in indices measuring local taxes and shared taxes are summarized in Table IV-13. Knoxville is utilizing all the local revenue sources provided by state law except the motor vehicle tax or "wheel tax." This tax, however, must be levied by the county and approved by referendum. To data only twenty-eight counties in Tennessee utilize this tax.

Expanded use of the sales tax is an option for the city to increase general fund revenues, but it is one which is unpopulated with the voters. Tennessee state law provides for a county-wide levy of up to 2.25 percent of the state sales tax subject to citizen approval by referendum.[20] Where the county-wide local sales tax exists, a

[20] Tennessee Code Annotated, sec. 67-6-701 et seq.

TABLE IV-13

REVENUE, DEBT AND EXPENSE INDICES

Financial Elements	Year		
	1960	1970	1980
Revenue			
Ratio of Per Capita Local Taxes to Assessed Property Value	3.18	3.24	6.35
Local Taxes	$ 65.79	$ 84.47	$182.99
State Shared Taxes as Percent of Total General Fund Revenues	8.08	9.77	22.05
State Shared Taxes Per Capita	$ 7.05	$ 11.76	$ 61.94
State Aid to Education Per Capita	$ 17.90	$ 47.18	$ 98.43
Debt			
Total Debt Per Capita	$270.87	$206.03	$381.44
Annual Interest Per Capita	$ 8.42	$ 7.74	$ 23.63
Annual Debt Service Per Capita	$ 24.67	$ 22.28	$ 39.67
Expenses			
Fire Expenses Per Capita	$ 9.18	$ 22.06	$ 58.19
Police Expenses Per Capita	10.17	17.94	54.04
All General Fund Expenses Per Capita	73.32	121.22	278.50
Average City Employee Annual Salary (General Fund)	NA	5,532.00	13,044.00
FTE General Fund Employee per 1,000 Residents	NA	10.6	11.7
FTE All City Employees per 1,000 Residents	NA	11.4	13.7

Sources: Knoxville, Tennessee. Annual Financial Report for the years cited.

municipality in that county may levy a sales tax equal to the difference between the county tax and the maximum rate. In 1965 voters approved a county-wide one cent sales tax with half of the proceeds being distributed to city and county school systems and the other 50 percent distributed to the political jurisdiction of collection. The city voters approved an additional one-half cent sales tax in 1971. An increase in the local option sales tax was submitted to city voters in 1977, 1980 and 1981, but these attempts to raise additional revenues failed.

The revenue proposition states that the inability to tax new resources concentrates taxes on city residents and existing resources. Tax increases on a slow growing or declining tax base will be resisted by city residents and by elected officials. The slow growth of Knoxville's property tax base is evident from the data presented. Revenues from property taxes have not grown because the property base has not increased in value. Property tax revenue increases have been the result of tax rate increases, the one exception being the increase in the city's taxable property with the 1962 annexation.

The other main source of revenue, state shared taxes, has increased as a percent of the total general fund revenues. These taxes are legislated and collected at the state level. State legislated taxes that must be authorized at the local level, such as the local option sales tax, are not utilized to the maximum legal limit because of voter opposition.

A slow growing tax base coupled with increasing expenditures provide fertile ground for fiscal stress in a city. The expenditure

side of the municipal finance component is examined in the following sections.

Revenue from state shared taxes have increased in importance for the general fund, but great concern has been expressed that the state/local tax system in Tennessee is inelastic and would not produce adequate revenues to meet public service demands and the responsibilities of government especially in light of decreasing federal support for local government.[21]

Debt Element

The debt element of the financial component is limited to the city's long-term debt excluding debt for the sewer system and airport which are enterprise funds with revenues from charges dedicated to repayment of debt. The debt element in this study, or the net bonded debt as it is called, is the debt which is paid from the general fund and secured by property taxes. It is used to measure the level of future commitment which has been undertaken by the city for public improvements and development.

Muller found that declining cities pay more interest and more on total debt service per capita than growing cities. The per capita "full-faith-and-credit" debt is higher in declining cities than in growing cities.[22] In this study debt per capita is not compared to the debt figures of growing or declining cities found in Muller's study,

---

[21]Green, 166.

[22]Muller, 60-61.

but the debt per capita for Knoxville is compared over time to determine how much it is increasing and whether an increasing debt will inhibit future debt incurrence for capital improvements and maintenance of the city's infrastructure.

The net bonded debt per capita has followed an up-down-up path over the years of this study as seen in Table IV-13. The debt per capita decreased in 1970 from the 1960 figure by 24 percent, but in 1980 the debt per capita increased 85 percent from the 1970 low. The overall increase of debt per capita has been 41 percent. The decrease in per capita net bonded debt in 1970 is due to the change in population from 1960 to 1970. The 1962 annexation added over 56,000 more residents to the city population so that the 19 percent increase in net bonded debt is translated into a decrease when measured on a per capita basis.

Debt restructuring and refinancing also accounts for the decline in 1970. The decrease in debt in 1966 resulted from the shift of $7.8 million general obligation bonds from debt payable from property taxes to the sewer revenue fund, and the retirement of $5.6 million bond anticipation notes with proceeds from the sale of sewer revenue-general obligation bonds. In the event the city does not charge sewer rates sufficient to pay the debt on these bonds ad valorem taxes must be levied and collected to cover the deficiencies.

After 1970 the net bonded debt began to increase each year as bonds were issued for the purposes of public improvements. Among the projects financed by bonds were Middlebrook Pike, Summit Hill,

and First Creek Drainage improvements. Bonds issued for improvements relating to the planned 1982 World's Fair increased the net bonded debt after 1978.

Expense Element

Howell and Stamm found that the direct link between changes in the economic, social and structural conditions of a city and the city's expenditures make the expense side of municipal fiscal performance a more important indicator of the financial condition of a city than the revenue side. Once the commitment to a certain level of expenditure has been made taxes must be raised, transfers made, or debt incurred in order to bring the city's revenues in line with expenditures.[23]

One of the factors that has to be considered in studying municipal expenditures, however, is inflation which increased costs rapidly in the late 1960s and all through the 1970s. Per capita spending grew 163 percent for the ten year period from 1962 to 1972 in all state and local governments and 198 percent in twenty-eight big cities.[24] According to economists, about 27 percent of the increased costs in cities was attributable to inflation. Another 17 percent was due to real growth in employee compensation, and the remaining 55 percent increase resulted from more employees, materials, and supplies to deliver government services.[25]

---

[23]Howell, 71.

[24]Stanley, 103.

[25]Ibid., 104.

Inflation has contributed greatly to the increasing costs of government for Knoxville. From 1960 to 1970 inflation accounted for about 61 percent of the increase in general fund expenses, but in the next ten years, 85 percent of the increase in expenditures can be explained by inflation. On the other hand, inflation eroded the value of the increasing tax rate on property. The other causes cited for the rapid increases in costs of government services are increased work force, wages, and benefits which will be examined briefly in this study.

Table IV-14 shows the per capita costs in 1972 dollars and percent change of selected services and expenses that are paid from the general fund. The most obvious effect of the calculations on this table is to reduce the dramatic increases in 1980 from 1970 and to shift much

TABLE IV-14

PER CAPITA COSTS OF LOCAL SERVICES IN 1972 DOLLARS FUNDED BY GENERAL FUND

	1960	1970	Percent Change	1980	Percent Change
Annual Debt (Includes Interest)	$ 35.90	$ 24.35	-32	$ 22.35	-8
Annual Interest on Debt	12.25	8.45	-31	13.31	58
Fire Expenses	13.37	24.11	80	32.78	36
Police Expenses	14.81	19.61	32	30.44	55
Other General Fund Expenses	41.13	64.02	56	72.58	13
All General Fund Expenses	106.73	132.48	24	156.90	18

Source: Knoxville, Tennessee. Annual Financial Reports for the years cited.

of the real increase in costs to the 1970 column which would include the costs of extended municipal services to those areas annexed in 1962. The extension of municipal services to the annexed areas paid out of the general fund involve labor intensive services such as police and fire protection, street cleaning and maintenance, garbage pickup, codes inspection and enforcement. The addition of territory also involved additional capital costs to build fire stations in these areas.

The discussion which follows attempts to examine the factors other than inflation and annexation which would increase the city's operating costs. These are work force, wages, and employee benefits since personnel costs account for the dominant share of local service outlays.

Work Force. City employment figures are not available for the first two years of this study. After 1962 the city treasurer's office has compiled an employee count for the U.S. Department of Labor. In 1962 the average annual full-time employment for the general fund was 1,103. Based on 1960 census figures this translates into 9.9 full-time employees per 1,000 residents. In 1970 the city employed 10.6 full-time personnel per 1,000 inhabitants which amounts to a 7 percent increase from 1962. By 1980 there was a 10 percent increase to 11.7 full-time employees. These figures are not compared to any standards, but Muller found an average of seven workers per 1,000 residents in 1967 for all cities under half a million residents and in 1972 an average of 7.5 workers for the same sample.[26] When one considers

---

[26]Muller, 39.

that the full-time employment figures used for Knoxville are only those under the general fund, Knoxville's city employment rolls are considerably higher than these averages. When total employment figures, which include employees in enterprise and special funds and federally sponsored programs, are used there were eleven city employees per 1,000 residents in 1970, and fourteen per 1,000 in 1980, a 27 percent increase. In 1975 the city employed the highest number of workers at 3,108. Sixteen percent of these employees were paid under the federally sponsored CETA program.

Wage and Benefits. Personnel costs, including regular salaries plus benefits, comprised 46 percent of total general fund expenditures in 1965. In 1970 personnel expenses were 49 percent of the total expenditures, and they comprised 54 percent of the budget by 1980. These increases are due to the increased number of employees, as mentioned heretofore, and increased wages and benefits. In 1965 the average annual salary of a city employee was $4,020. A 38 percent increase from this level to 1970 made the annual salary amount to $5,532. By 1980 the annual salary was $13,044, a 136 percent increase. When 1972 dollar values are used the 1970 increase was 12 percent and 22 percent in 1980.

Once again the effects of inflation are evident, but salaries do not increase automatically to adjust to inflation. Salary increases result from employee demands for more pay and agreement by budget-makers to increase salaries. Cost-of-living increases become necessary

to compensate for inflation, but salary increases have also been targeted to certain groups of city employees for the purposes of retaining experienced workers, improving services, and maintaining parity with similar employees in peer cities. Work hazards, no doubt, also contribute to wage differentials among employees.

Muller found that in both declining and growing cities higher wages are paid to uniformed personnel--police and fire department staff--than to other city workers.[27] This is true also for Knoxville. After a 1967 wage survey, in which it was demonstrated that city policemen and firemen were not only paid far below the national average for cities of similar size but were the lowest for any city of comparable size in the southeast region, a pay improvement plan costing $500,000 was approved for uniformed personnel by City Council. Revenues to cover the pay raises were to be recovered by increasing the inspection fee on alcoholic beverages. The state legislature, however, stopped this revenue increase by setting a maximum on the inspection fee at its 5 percent level. Belt tightening and cuts by other city departments funded the police and firemen pay plan included in the 1968 annual budget.[28]

Municipal employee unionization and the increasing political strength of municipal workers in cities where traditional political party controls have declined have also been cited as factors in increasing

---

[27]Ibid., 44.

[28]See Letter of Transmittal by Edward C. Snoddy, Director of Finance, City of Knoxville Financial Audit, 1968, dated February 27, 1969.

wage and benefit costs for cities.[29] The use of Knoxville city employees to elect or defeat city officials has long been rumored, but their power may be illusory. The threat of nonsupport of a council member or a mayor standing for reelection has been used by employee organizations but the effects have not been demonstrated.

The city is not required by local or state legislation to collectively bargain with organized groups of city employees except teacher associations. The mayor, however, may meet and confer with employee representatives for the purpose of reaching understandings relative to wages, salaries, fringe benefits or other employment conditions. Of course, employee organizations may, like any other interest group, plead their cause before city council during public hearings on the budget.

Aggregation of city employee interests are through three organizations with one objective being to improve wages and benefits for their members. These organizations are the Knoxville Fraternal Order of Police, the Knoxville Firefighters Association, and the City Employees League. The uniformed organizations are stronger and more active than the City Employees League. Firemen and policemen, whose services are perceived as vital by the general public, have been more adament in demanding wage benefit increases than the nonuniformed organization. The uniformed groups have also been successful in carrying their appeals to the public in order to generate support for

---

[29]Muller, 40.

their demands. This has paid off for uniformed personnel in that their benefits, especially insurance, disability, and retirement, are more generous than for nonuniformed employees.

Summary on the Financial Data and Fiscal Stress Proposition

Fiscal stress has been defined as an imbalance between financial capacity and the demand for public goods and services. The proposition on fiscal stress states that the imbalance occurs when city expenses increase and taxes and debt are increased to cover the costs while at the same time the city's capacity to increase own-source revenues is declining.

The data on the revenue side of Knoxville's fiscal condition indicate that the city has a declining tax base and its capacity to grow with expenditure needs are limited. The city's property tax base, the main source of general fund revenues, has grown at an overall average rate of 4 percent while expenses have increased at twice that rate.

Urban economists have attributed part of the problem of dwindling tax revenues to frozen city boundaries. After the last large scale annexation of territory by Knoxville in 1962, the city's property tax base did increase by nearly 50 percent. This would have provided ample tax resources for expanded services and capital improvements in the new areas had the existing tax rates not been reduced from $3.10 per $100 value in 1962 to $2.85 in 1964. The reasons for this tax cut will be examined in Chapter VI, but for the purpose of this summary the effects of the cut had long-term implications for the city's fiscal

position. The increased costs to provide services for an expanded city were imposed on tax revenues that were essentially the same as prior to annexation, and the costs of expanded labor-intensive services and capital improvements had to be covered by later property tax increase.

Inflation has had a great impact on the city's fisc also. About 61 percent of the increased costs to deliver city services from 1960 to 1970 are due to inflation, and 85 percent of the increase from 1970 to 1980 is explained by inflation when one uses 1972 dollars as a base. At the same time, inflation was eroding the increasing tax rates on property.

To fill the gap between increasing expenses and sluggish revenue growth, other sources of revenues became important to the city. One of these sources was state shared taxes. These taxes were only 8 percent of the general fund revenues in 1960, but by 1980 they comprised 22 percent of the revenues. The other sources of funds are intergovernmental revenues, both state and federal, which are specific in purpose, and federal general revenue sharing money which may be used for general government purposes. The latter sources, intergovernmental revenues, are examined in the next section.

Intergovernmental Aid Component

Intergovernmental aid is the transfer of revenue to a municipality from county, state, or federal governmental units for specific or discretionary purposes. Part of intergovernmental aid is in the form of

shared taxes from the state. Shared taxes are collected by the state government and a predetermined share is distributed to city and county governments. The shared taxes which are reported in Knoxville's general fund were examined in the previous section on city revenues, and, with the exception of gasoline and motor vehicle fuel taxes, will not be treated as intergovernmental revenues in order to concentrate on the impact of state and federal categorical grants, earmarked shared taxes, and federal general revenue sharing on the city's financial performance.

In the past twenty years Knoxville has received an increasing share of its revenue from higher levels of government. In 1960 the city received a total of $2,910,725 in aid from the state and federal governments, an amount equal to 30 percent of the total general fund revenues. In 1980 the city received $42,257,620 in specific grants and general revenue sharing money, an amount equal to 68 percent of general fund revenues. Like many other cities in the nation, Knoxville became the provider of services directed and financed by other levels of government since most of the federal and state assistance received was earmarked for special purposes.

Federal Intergovernmental Aid

In 1960 the federal government's share of intergovernmental aid was only 4 percent of the total received by Knoxville, but by 1980 this share increased to 24 percent. Initially federal aid was for educational purposes only, but by the mid-1970s the city was receiving funds for

training the unemployed, community and economic development, transportation, and sewage treatment improvements.

Federal general revenue sharing money is the only general purpose grant received by the city from the federal government. Funds from Title I of the State and Local Fiscal Assistance Act of 1972 have averaged $4,000,000 annually. Restricted by minimal conditions, general revenue sharing may be used to finance almost any governmental objective, and from 1973 to 1979 the city used this money for general purpose city operations such as development of its computer information service, for libraries, and the municipal zoo. After 1980, however, general revenue sharing money was used exclusively to help fund operation of the city school system.

Specific federal grants which have been significant for the city since the mid-1970s are the Community Development Block Grant, Urban Development Action Grants, and Environmental Protection Agency grants. All federal funds, specific and general, are shown in Figures IV-4 and IV-5. The impact of the three specific grants mentioned above are discussed briefly.

The 1974 Community Development Block Grant program, focused primarily on low- and moderate-income persons, supports a wide array of neighborhood redevelopment activities. Funds may be used for the acquisition, development, and rehabilitation of real property, provision and improvement of public facilities, and relocation and demolition activities. After the first two years of this program, during which CDBG money was spent with little purpose or direction by the city,

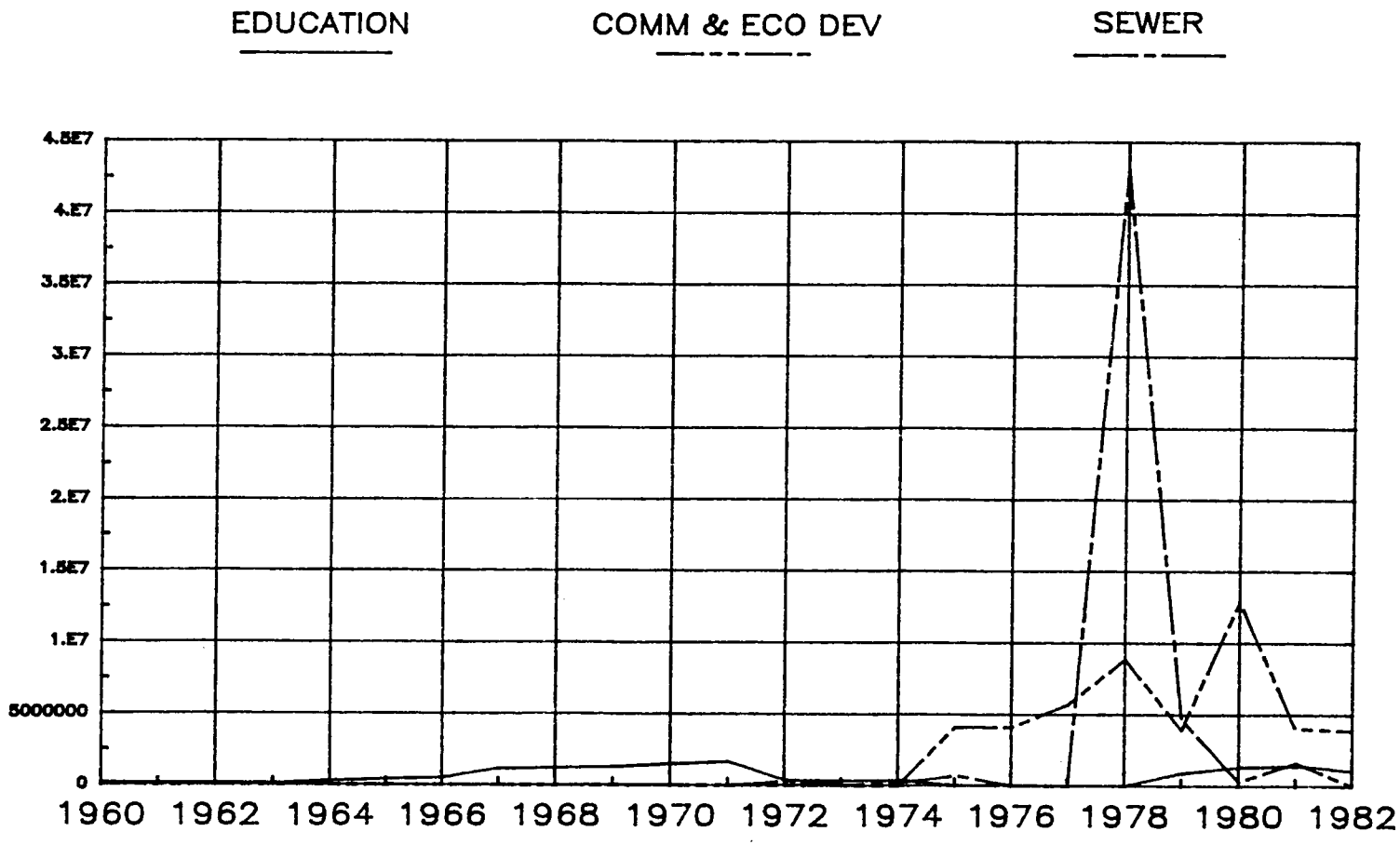


FIGURE IV-4. FEDERAL INTERGOVERNMENTAL AID BY FUNCTIONAL CATEGORIES: EDUCATION, COMMUNITY AND ECONOMIC DEVELOPMENT, AND SEWER.

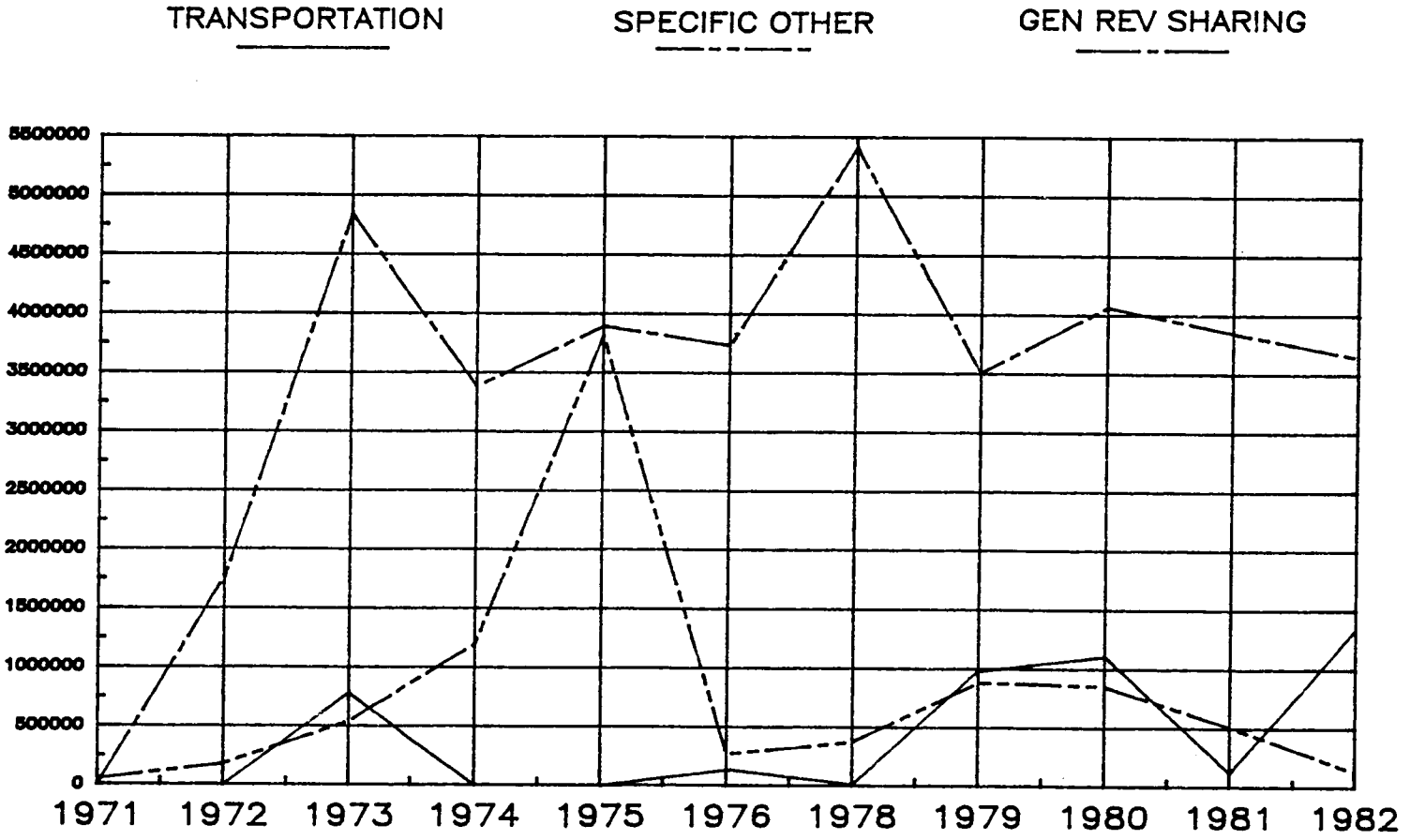


FIGURE IV-5. FEDERAL INTERGOVERNMENTAL AID BY FUNCTIONAL CATEGORIES: TRANSPORTATION, SPECIFIC OTHER, AND GENERAL REVENUE SHARING.

Knoxville began to concentrate on improvement of housing and public facilities in designated low-income Neighborhood Strategy Areas. A major expenditure of $6.2 million was for a multipurpose community facility, the Mechanicsville-Beaumont-Lonsdale Center, which was in a declining low-income area and provided space for social service organizations, a branch library, and firestation. Community Development grants to the city, requiring no local matching funds, have average $4,000,000 a year. The average, however, masks the decline, both relatively and absolutely, in this program since 1980.

Urban Development Action Grants, instituted during the administration of President Carter were awarded to severely distressed cities and urban counties. In order to be eligible for the UDAG program a city had to pass three minimum standards, but a city in which the poverty level was less than half the minimum standard had to pass four. The standards were per capita income, unemployment, poverty, age of housing, population lag/decline, and job lag/decline. Cities were ranked from worst to best in these categories and a composite distress list compiled. In the listing of distressed cities, Knoxville was classified as moderately distressed, ranking 237 in a range from 1 to 447, the higher number being the least distressed. Further, city eligibility for the UDAG program was ranked by a specially devised impaction ranking system encompassing standardized scores of city poverty, population, and other decline indicators. Knoxville was ranked 322 in a range of 1 to 447, the high number being the least impacted city.

Before grants were awared, however, the eligible city had to demonstrate that city officials and private business could work in close cooperation on economic development ventures since the UDAG program was designed to achieve a high degree of private fund leverage. The private financial commitment had to be in place before funds were awarded to the city. Knoxville received over $13,000,000 in UDAG money for acquisition and development of the 1982 World's Fair site. Private funds in this venture were estimated to be $15,080,000.

Knoxville's sewage treatment system, under a federal court order to improve the quality of its effluent before discharging into the public waterways, benefitted from the federal Environmental Protection Agency construction grant program which covered up to 75 percent of the costs for rehabilitation and construction of wastewater treatment facilities. The city received approximately $50,400,000 in federal funds, and raised its 25 percent share from the sale of sewer revenue bonds. The use of federal funds and the bond covenants required the city council and the mayor to fix, establish, and maintain rates, fees, and charges which would be sufficient to produce revenues to repay the annual debt and to pay for the operation and maintenance costs of the wastewater system.

State Intergovernmental Aid

Education has been the dominant function supported by state aid. In 1960 education accounted for 72 percent of the state aid received by the city, and 34 percent of the local share of education costs. In

1980, 84 percent of state aid was for education. This amounted to 47 percent of local education funds.

State street aid, used only for the construction, maintenance, and improvement of public streets other than state and federal highways, is the second largest category of earmarked funds which the city received from the state of Tennessee. In 1960 education and street aid were the only categorical grants received by the City. Street aid comprised 28 percent of the total in 1960, but by 1980 it was only 8 percent of the total state aid. Education had increased as a percent of total state intergovernmental aid, even though it grew by less than 5 percent from 1973 to 1980, and new state funded programs had been instituted. State street aid also shrank as a percent of total aid because of the slow growth in state gasoline tax revenues. When state street aid is adjusted to 1972 dollar values, Knoxville received less money in 1982 than in 1960. Inflation had also eaten into the amount of street maintenance and construction that could be accomplished. This is dramatically illustrated by Figures IV-6 and IV-7 which show 1972 dollar values and nominal values for revenues and expenditures from the state street aid fund. In real terms the city was spending less in the 1980s for street maintenance and construction than in 1960.

Figure IV-8 shows all state aid revenues by function which have been allocated to Knoxville from 1960 to 1982. After 1980 programs initiated in the early 1970s for senior citizens and law enforcement ceased to be funded. Education and streets were again the functions financed by state aid.

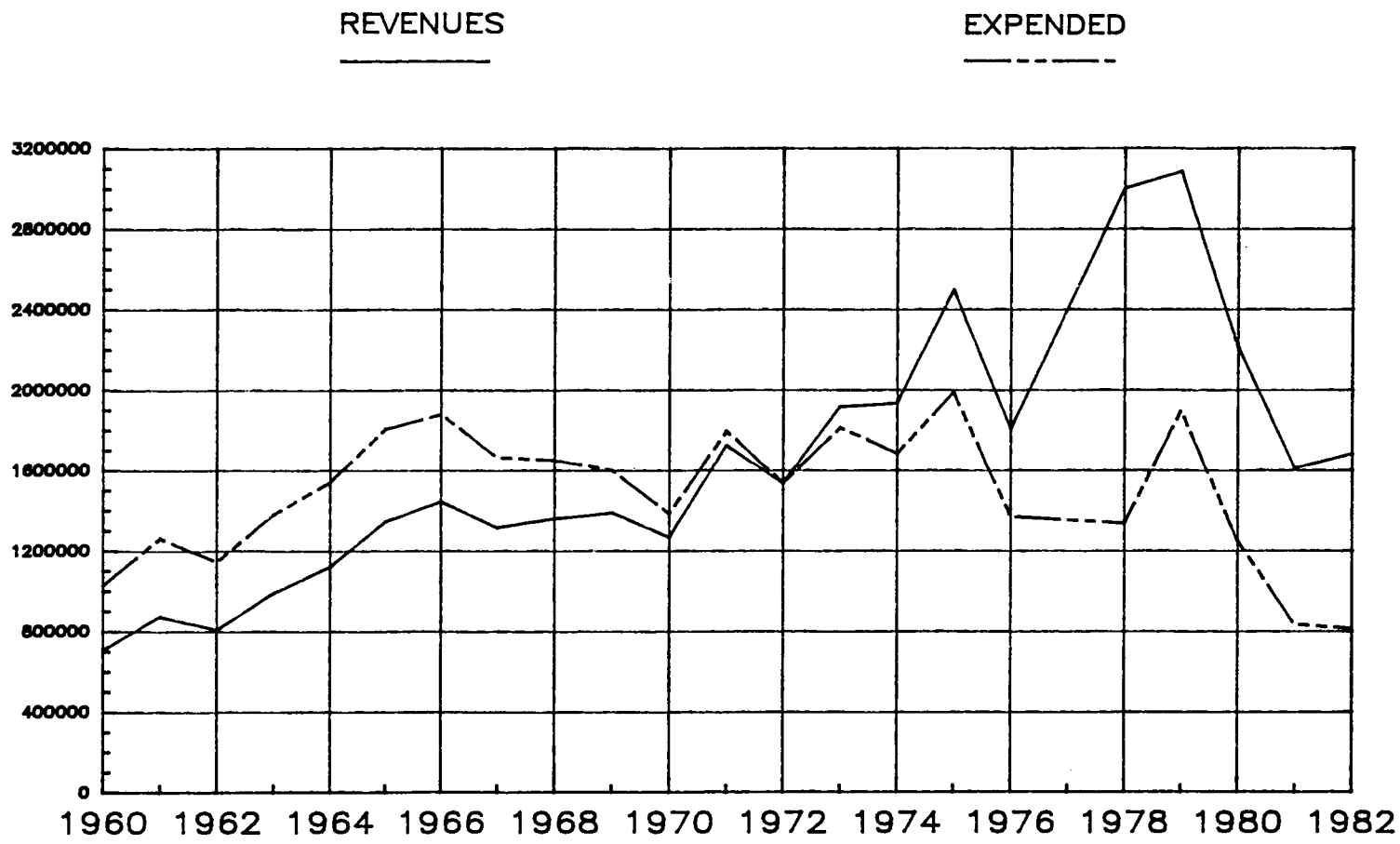


FIGURE IV-6. STATE STREET AID REVENUES AND EXPENDITURES, 1972 DOLLAR VALUES.

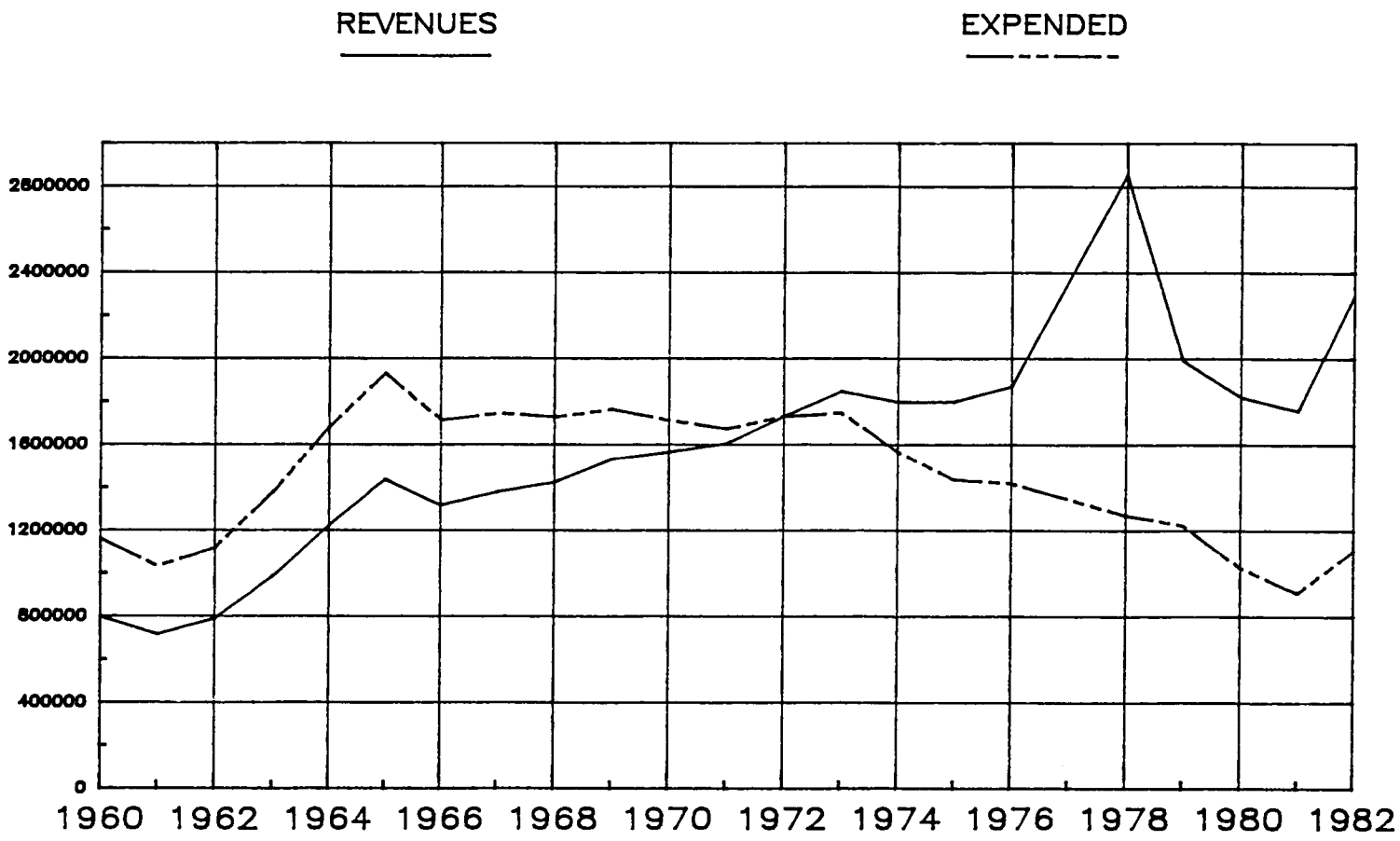


FIGURE IV-7. STATE STREET AID REVENUES AND EXPENDITURES, NOMINAL VALUES.

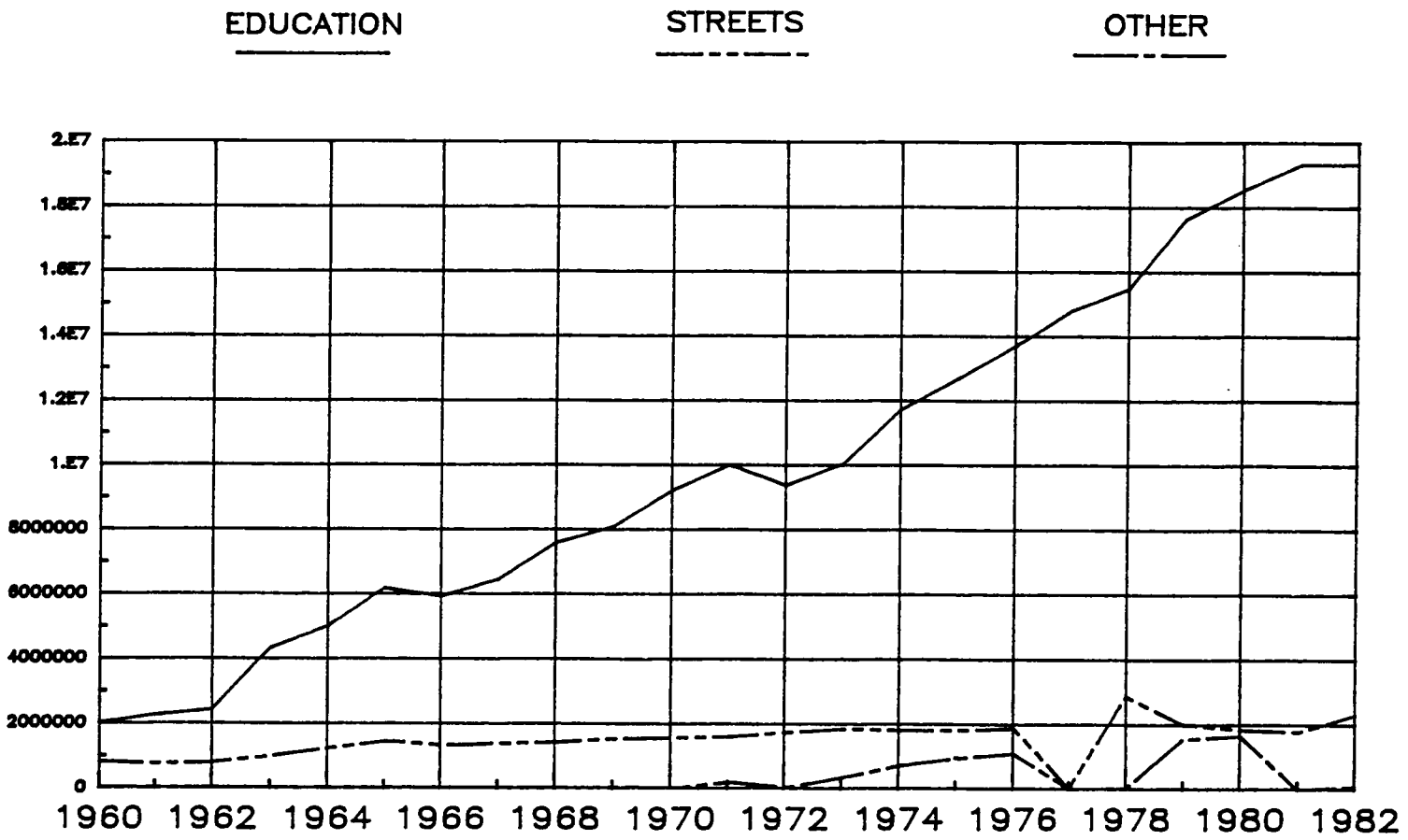


FIGURE IV-8. STATE INTERGOVERNMENTAL AID BY FUNCTIONAL CATEGORY: 1960 TO 1982.

Summary on the Intergovernmental Data and Proposition

Federal and state aid have grown in importance to the city since 1960. This aid has not been just a supplement to help fund municipal services but a primary support of services. Federal and state aid have probably enabled Knoxville to provide some services without having to increase own-source revenues. For example, Community Development funds have enabled the city to construct public facilities and improve city streets and sidewalks in neighborhoods that would not have received the improvements otherwise. The annual appropriation of all federal general revenue sharing money to city schools enabled the city to continue to support increasing municipal service costs in the general fund budget even though own-source revenues have not kept pace with increasing costs.

Toward the close of this study period, federal funds were beginning to be curtailed as trends toward fiscal conservatism were emerging at both state and federal levels. From 1980 to 1982 state aid to local governments in Tennessee grew far less than local general fund budgets even though state aid as a percent of the budge grew in importance to the locality.[30]

In 1980 Knoxville's status as an intergovernmental city, to use the concept as defined in The New Reality of Municipal Finance,[31] is

---

[30]Steven D. Gold, State and Local Fiscal Relations in the Early 1980s (Washington, D.C.: The Urban Institute Press, 1983), 23.

[31]Burchell, 1.

more apparent when Knoxville is compared with peer cities in the southeastern region. This is the subject of the section which follows.

A Comparison of Knoxville with Regional Cities

In this chapter we have tried to determine if Knoxville is a declining city and if it is a city suffering from fiscal stress. The study has centered on a longitudinal analysis of certain economic and social elements of the city's environment and the city's fiscal input and output in the environment. The social and economic indices studied lead to the conclusion that Knoxville is a declining city. The fiscal picture is one of a declining or slow growing tax base from which increasing taxes are drawn to cover increasing expenditures. In order to affirm these conclusions and to look at Knoxville in comparison with peer cities in the southeastern region a brief inter-city comparison follows.

The data are taken from the County and City Data Book for the years based on 1960, 1970, and 1980 census information, thus there is a difference in some data which have been displayed previously. This is especially the case for Knoxville revenues and expenditures which have been used in the longitudinal analysis of Knoxville's fiscal picture. The sources of longitudinal data have been city financial audits and budgets, and the data have been confined to the general fund unless otherwise stated.

The twenty southeastern cities which have been selected for comparison range in 1960 population from 62,800 to 201,600, or at least

50 percent more or 50 percent less in 1960 population than Knoxville. Memphis, Tennessee, however, which had a 1960 population of 497,524 was included so that a comparison could also be made of Knoxville with the three other large cities in Tennessee. The data selected for comparison were limited by availability. The format and scope of the data varied in the County and City Data Book from decennial edition to edition. The cities surveyed and the measurable indicators are displayed in Appendix A.

Comparison of Local Environmental Factors

The local environmental factors available for comparison included certain of the structural, demographic, and economic indicators used in the Knoxville longitudinal analysis. Of the structural comparisons only land area data were consistently gathered over the years compared. Housing data were inconsistent, but the change in owner-occupied housing could be determined. Population change was the only demographic statistic available for all cities surveyed. The economic indicators available for comparison were manufacturing employment, unemployment, per capita and median income, and families in poverty statistics.

Since the analysis is one of change--growth or decline--from one decennial census to the next, percent change was calculated for each city and then the average percent change for all cities was calculated. Cities were arranged as being above or below the average for all cities. For some indicators, such as unemployment rate, median and

per capita income, the percent change was not the basis for comparison, but the figures themselves were averaged, and the cities were arrayed above or below the average median income, above or below the average per capita income, and above or below the average percent unemployment for all cities surveyed. A clear picture of Knoxville as a declining city emerges from the comparison.

In Table IV-15 Knoxville's position with respect to the twenty-one southeastern cities' average is shown for each structural, social, and economic indicator. Knoxville is above the average percent change only in land area and population gains from 1960 to 1970. The above average percentage changes reflect, of course, the impact of the 1962 annexation. On the economic comparisons Knoxville lost more manufacturing jobs than the average loss in the twenty-one cities; Knoxville's median and per capita incomes were less than the averages for 1960, 1970, and 1980; and Knoxville's unemployment rates were above the average in 1960, 1970, and 1980. The number of Knoxville families in poverty, as a percent of the total population, failed to decline from 1970 to 1980, the only period for which these statistics were available, while the twenty-one city average decline was 10 percent.

When Knoxville is compared with Chattanooga, Nashville, and Memphis, Table IV-16, the picture of decline is mixed. In land area and population growth from 1960 to 1970 Knoxville was second in both these growth categories. From 1970 to 1980 there was zero growth in both land and population. The percent of owner-occupied housing to the total occupied housing has been seen to increase in a city after

TABLE IV-15

COMPARISON OF ENVIRONMENTAL FACTORS,
21 SOUTHEASTERN CITIES

Factors	CHANGE		
	1960 to 1970	1970	1970 to 1980
Structural			
Land Area Average	163%		106%
Number Cities Above	5		6
Number Cities Below	16		15
Knoxville	203%		0%
Owner-Occupied Housing	9%		-1%
Number of Cities Above	6		10
Number of Cities Below	15		11
Knoxville	8%		-11%
Demographic			
Population Growth	34%		19%
Number of Cities Above	7		10
Number of Cities Below	14		11
Knoxville	56%		0%
Economic			
Manufacturing Jobs	0%		-10%
Number of Cities Above	9		11
Number of Cities Below	12		10
Knoxville	-10%		-22%
Families Below Poverty Level	NA		-10%
Number of Cities Above			12
Number of Cities Below			9
Knoxville			-0%
	1960		1980
Median Income Average	$ 4,892	$ 8,718	$18,028
Number of Cities Above	11	9	11
Number of Cities Below	10	12	10
Knoxville	$ 3,203	$ 7,891	$15,676
Per Capita Income Average	$ 1,689	$ 2,978	$ 7,014
Number of Cities Above	10	8	10
Number of Cities Below	11	13	11
Knoxville	$ 1,475	$ 2,742	$ 6,378
Unemployment Rate Average	4.8%	3.8%	6.1%
Number of Cities Above	11	11	9
Number of Cities Below	10	10	12
Knoxville	6.7%	3.9%	7.0%

Source: U.S. Department of Commerce, Bureau of Census, County and City Data Book for the years cited.

TABLE IV-16

COMPARISON OF ENVIRONMENTAL FACTORS,
TENNESSEE'S LARGE CITIES

Factors	CHANGE 1960 to 1970	1970	1970 to 1980
Structural			
Land Area Average	290%		110%
Chattanooga	43		136
Knoxville	203		0
Memphis	70		21
Nashville	1,651		-6
Owner-Occupied Housing	14%		-2%
Chattanooga	6		12
Knoxville	8		-11
Memphis	2		-1
Nashville	48		-5
Demographic			
Population Growth Average	50%		6%
Chattanooga	-8		41
Knoxville	56		0
Memphis	25		4
Nashville	162		2
Economic			
Manufacturing Jobs Average	7%		-21%
Chattanooga	7		-22
Knoxville	-10		-22
Memphis	0		-19
Nashville	3		-21
Families Below Poverty Level	NA		-9%
Chattanooga			-32
Knoxville			0
Memphis			-9
Nashville			-8
	1960		1980
Median Income Average	$ 4,093	$ 8,280	$17,167
Chattanooga	4,438	7,112	16,706
Knoxville	3,203	7,891	15,676
Memphis	4,915	8,646	16,921
Nashville	3,816	9,469	19,366
Per Capita Income Average	$ 1,483	$ 2,756	$ 6,612
Chattanooga	1,523	2,487	6,328
Knoxville	1,475	2,742	6,378
Memphis	1,650	2,793	6,466
Nashville	1,282	3,003	7,276
Unemployment Rate Average	5.4%	3.9%	7.0%
Chattanooga	5.3	3.4	7.5
Knoxville	6.7	3.9	7.0
Memphis	4.6	4.7	8.5
Nashville	4.8	3.4	5.1

Source: U.S. Department of Commerce, Bureau of Census, County and City Data Book for the years cited.

the annexation of surrounding suburban areas, and Knoxville's percentage increase was the second highest of the four large Tennessee cities over the 1960 to 1970 period. From 1970 to 1980, when Knoxville expanded its boundaries by less than a square mile, the percent change in owner-occupied housing declined more than in the other three Tennessee cities.

Comparative economic data indicate that the loss of manufacturing jobs had already started in Knoxville in the ten year period from 1960 to 1970 while there was some growth in Chattanooga and Memphis. In the next ten years, however, all four of Tennessee's large cities had a decline of 19 percent or more in this employment sector.

In median and per capita income Knoxville was in the bottom half for 1960, 1970, and 1980. Unemployment in Knoxville was higher than the four-city average in 1960, but in 1970 and 1980 Knoxville's unemployment rate was the same as the four-city average. While the percent of families below the poverty level declined from 1970 to 1980 in Chattanooga, Memphis, and Nashville, the percent remained the same for Knoxville.

From the limited comparison made here of structural, social, and economic indicators between Knoxville and the three other large Tennessee cities, Knoxville was not one of the better-off of Tennessee's large cities in 1980.

Comparison of Fiscal Factors

The revenue elements of the twenty-one southeastern city comparison are limited to per capita total revenues received by the cities,

intergovernmental revenues as a percent of the total revenues, taxes as a percent of the total revenues, and property taxes received. The property tax has also been broken down on a per capita basis for the cities. For each revenue element an average for all cities was calculated along with the percent change for each city. The twenty-one cities were then arranged below or above the average.

The expenditure elements are also limited by availability and consistency. The elements which are compared, total expenditures, police and street expenditures, and debt outstanding, have been calculated on a per capita basis for 1960, 1970, and 1980. Full-time equivalent city employment have been calculated per 1,000 city residents for all three decennial periods. These data were averaged for all cities, and the number of cities above and below the twenty-one city average were noted along with Knoxville's position relative to the all cities average. Tables IV-17 and IV-18 display the revenue and expenditure data for the twenty-one city comparison.

When one looks at total revenues per capita and total expenditures per capita, Knoxville is above the twenty-one city averages for both in 1960, 1970 and 1980. Total revenues have increased to keep up with the expenditures. The expenditure data for police protection are not remarkably higher or lower in Knoxville than the twenty-one city averages, but expenditures for city streets in the three periods surveyed were significantly lower than the twenty-one city averages. Debt outstanding per capita in Knoxville for 1960, 1970 and 1980 were also significantly higher than the twenty-one city averages.

TABLE IV-17

COMPARISON OF REVENUE FACTORS,
21 SOUTHEASTERN CITIES

Revenue Elements	1960	1970	Percent Change	1980	Percent Change
Total Revenues Per Capita					
21-City Average	$ 94.91	$170.63	80	$587.62	244
Number Cities Above	11	11		8	
Number Cities Below	10	10		13	
Knoxville, Tennessee	$152.02	$264.62	74	$797.58	201
Intergovernmental Revenues as Percent of Total					
21-City Average	18.6%	19.9%	7	36.9%	86
Number Cities Above	8	8		9	
Number Cities Below	13	13		12	
Knoxville, Tennessee	35.6%	48.9%	37	54.0%	10
Taxes as Percent of Total					
21-City Average	56.5%	52.8%	-7	36.2%	-31
Number Cities Above	11	12		10	
Number Cities Below	10	9		11	
Knoxville, Tennessee	49.7%	32.9%	-34	26.3%	-20
Property Tax as Percent of Total Taxes					
21-City Average	36.4%	67.0%	84	58.1%	-13
Number Cities Above	11	13		10	
Number Cities Below	10	8		11	
Knoxville, Tennessee	43.3%	83.0%	92	83.7%	1
Property Taxes Per Capita					
21-City Average	$ 33.39	$ 54.29	63	$111.80	106
Number Cities Above	9	9		9	
Number Cities Below	12	12		12	
Knoxville, Tennessee	$ 65.88	$ 72.00	9	$176.00	144

Source: U.S. Department of Commerce, Bureau of Census, County and City Data Book for the years cited.

TABLE IV-18

COMPARISON OF EXPENDITURE FACTORS,
21 SOUTHEASTERN CITIES

Expenditure Elements	1960	1970	Percent Change	1980	Percent Change
Total Expenditures Per Capita					
21-City Average	$103.95	$183.36	76	$535.30	192
Number Cities Above	9	9		8	
Number Cities Below	12	14		13	
Knoxville, Tennessee	$155.85	$292.12	87	$679.88	133
Police Expenditures Per Capita					
21-City Average	$ 10.00	$ 18.71	87	$ 63.80	241
Number Cities Above	7	10		9	
Number Cities Below	14	11		12	
Knoxville, Tennessee	$ 10.52	$ 20.45	94	$ 54.39	166
Street Expenditures Per Capita					
21-City Average	$ 13.00	$ 22.12	69	$ 41.76	89
Number Cities Above	7	10		8	
Number Cities Below	14	11		13	
Knoxville, Tennessee	$ 7.23	$ 11.39	58	$ 24.47	115
Debt Obligation Per Capita					
21-City Average	$259.00	$406.00	57	$669.00	65
Number Cities Above	7	8		9	
Number Cities Below	14	13		12	
Knoxville, Tennessee	$459.00	$599.00	31	$875.00	46
FTE City Employees Per 1,000					
21-City Average	15.1	18.3	21	18.6	2
Number Cities Above	6	7		7	
Number Cities Below	15	14		14	
Knoxville, Tennessee	30.4	35.4	16	33.2	-6

Source: U.S. Department of Commerce, Bureau of Census, County and City Data Book for the years cited.

On the revenue side intergovernmental revenues figure as a higher percent of total revenues for Knoxville than the twenty-one city average in 1960, 1970 and 1980, but the slow increase of these funds from 1970 to 1980 is noticeable. Taxes as a percent of all revenues in Knoxville were below the average for all cities surveyed, and Knoxville reflected the trend of decreases in taxes as a percent of all revenues. Property taxes, however, did not follow a decreasing trend. Not only were property taxes as a percent of all taxes higher in Knoxville than the twenty-one city averages, but they increased more than the twenty-one city average from 1970 to 1980. This same pattern holds when property taxes are converted to a per capita basis.

Perhaps the most important conclusions to be drawn from the above data for Knoxville are that property taxes and intergovernmental revenues are essential elements in the city's revenue picture. Property taxes have been increasing at a rate exceeding the twenty-one city average, and intergovernmental revenues have not been increasing sufficiently to provide enough revenue enhancement to stave off property tax increases. This is especially the case from 1970 to 1980 when per capita property tax increased 144 percent while the twenty-one city average was 106 percent. Intergovernmental revenues as a percent of Knoxville's local revenues increased only 10 percent while the twenty-one city average was 86 percent. This later finding also indicates that Knoxville was more dependent upon intergovernmental revenues in the earlier period than most other cities surveyed.

When Knoxville is compared with Chattanooga, Memphis, and Nashville, the same pattern emerges. As seen in Table IV-19, from

TABLE IV-19

PER CAPITA REVENUES AND EXPENDITURES IN TENNESSEE'S FOUR LARGEST CITIES (NOMINAL VALUES)

Elements	1960	1970	Percent Change	1980	Percent Change
Revenue Elements					
Total Revenues					
Chattanooga	$ 215	$ 380	77	$ 777	104
Knoxville	152	265	74	797	201
Memphis	130	288	122	791	175
Nashville	157	300	91	1,027	242
Total City Taxes					
Chattanooga	$ 52	$ 99	90	$ 208	110
Knoxville	76	87	14	210	141
Memphis	57	75	32	186	148
Nashville	74	1,629	210	465	-71
Property Taxes					
Chattanooga	$ 41	$ 79	93	$ 175	122
Knoxville	66	72	9	176	144
Memphis	43	53	23	132	149
Nashville	46	118	111	272	131
Expenditure Elements					
General Fund Expended					
Chattanooga	$ 214	$ 394	84	$ 797	102
Knoxville	156	292	87	680	133
Memphis	147	294	100	779	165
Nashville	155	342	121	864	153
Police Expenditures					
Chattanooga	$ 9	$ 20	117	$ 64	224
Knoxville	11	20	94	54	166
Memphis	10	24	132	78	231
Nashville	12	14	10	69	405
Street Expenditures					
Chattanooga	$ 36	$ 28	-22	$ 62	119
Knoxville	7	11	58	24	115
Memphis	13	11	-19	40	275
Nashville	12	27	131	39	42
Debt Outstanding					
Chattanooga	$ 223	$ 272	22	$ 422	55
Knoxville	460	599	30	875	46
Memphis	538	588	9	715	22
Nashville	466	682	46	966	42
TFE City Employees (per 1,000 residents)					
Chattanooga	35.8	40.3	13	34.4	-15
Knoxville	30.4	35.4	16	33.2	-6
Memphis	28.6	38.6	35	32.7	-15
Nashville	32.1	31.9	-1	36.7	15

Source: U.S. Department of Commerce, Bureau of Census, County and City Data Book for the years cited.

1970 to 1980 the percent increase in property tax was the second highest among the four large cities. On a per capita basis, the property tax at $176 in 1980 was also the second highest among the four cities. On the other hand, by 1980 intergovernmental revenues grew slowly as a percent of the total city revenues over the ten year period from 1970. These figures are shown in Table IV-20.

TABLE IV-20

INTERGOVERNMENTAL REVENUES AS A PERCENT OF TOTAL CITY REVENUES

Cities	1960	1970	Percent Change	1980	Percent Change
Chattanooga	52	57	10	62	9
Knoxville	36	49	36	54	10
Memphis	39	51	31	58	14
Nashville	41	30	-27	32	7

Source: U.S. Department of Commerce, Bureau of Census, County and City Data Book for years cited.

These conclusions are in agreement with findings of a study by the Tennessee Advisory Commission on Intergovernmental Relations. In 1980 federal aid to the state was a larger share of total revenues from all sources than the property tax. This was the first year that this occurred. Given the devolution of federal functions to states and decreasing federal aid, this probably will not happen again in this decade.[32]

---

[32]Green, 160.

According to the TACIR study, Tennessee cities are above the national average in dependency on the federal government just as the state is more heavily dependent on federal aid than many other states. In addition, local governments in Tennessee are above the average in dependency on sales tax and user charges. In contrast, Tennessee cities are below the national average in revenue from the state government.[33] Unpopularity at the local level for the sales tax prevents Knoxville and many other Tennessee cities from adopting the maximum local sales tax rate since such a measure would have to be approved by the voters. With no reform in the state's taxing system and the lack of a state income tax, this leaves the property tax as the most available tax to be raised in light of declining intergovernmental revenues, and Knoxville has resorted to increases in property taxes to cover increasing governmental costs. When the base for these taxes is shrinking, or barely growing, increasing property taxes to cover escalating costs places the city in the fiscal stress column.

A Summary on the Urban Decline and Fiscal Stress Components

The model of infrastructure disinvestment presented in this study grows from two concepts which describe conditions of a city. The conditions are not overnight phenomenon, but are the result of long term decisions and occurrences. The conditions are urban decline and fiscal stress. Before this study proceeds to investigate the city's

---

[33] Ibid., 164.

infrastructure, and whether or not disinvestment has occurred as a result of decisions by budgetmakers to skimp on maintenance or hold off on new investment in light of shrinking resources, the study must answer the questions inherent in the models' propositions. Is Knoxville suffering from urban decline? Is Knoxville a victim of fiscal stress? Yes; it is on both counts during the period studied.

The urban decline component posits that the city suffering from urban decline has failed to expand its territory, its housing stock is aged, employment opportunities for residents have declined, population growth lags, and its dependent population has increased. These indicators, their meaning and significance to the concept of urban decline, have been explained by reference to the literature and previous empirical studies. The data have been analyzed in detail in each section devoted to specific indicators, and from the analysis, the conclusion is that Knoxville does exhibit characteristics of a city suffering from urban decline.

At the beginning of the decade of the sixties, a period of rapid population growth in Knox County, Knoxville had fewer city residents than the remainder of the county but the 1962 annexation of 51 square miles and 56,138 residents reversed the decline. This annexation also increased the value of taxable property in the city by 50 percent. After 1962, Knoxville annexed less than a square mile over the next nineteen years included in this study, and population growth again started on a decline while the city's minority and aged population increased as a percent of the total. Other characteristics of urban decline are also present.

Though service sector job opportunities increased, manufacturing jobs, historically the base for Knoxville's growth, started decreasing in the early 1960s, a much earlier time period than the decline in manufacturing jobs generally evident in southeastern cities. Higher rates of unemployment and personal incomes that lagged below the average for southeastern cities are other indicators of the economic decline of Knoxville.

The socioeconomic conditions of a city are also reflected in its fiscal performance, and budgetary trends in Knoxville resemble those found in declining cities. Municipal expenditures in Knoxville have been consistently higher than the average for southeastern peer cities, and its debt obligation is higher than the average. On the revenue side, per capita revenues have increased greater than the average for similar southeastern cities, and of the components of city revenues property taxes and intergovernmental transfers have become the most important.

The fiscal stress proposition of this study's model is predicated on conditions of increasing taxes and debt per capita in an environment of slow growing or declining resources. Such a situation creates an imbalance between the financial capacity of the city and its ability to provide the government services needed or demanded by residents. Knoxville, through the decade of the 1970s and early 1980s, has been caught in this imbalance between financial resources and government service demands. Relying greatly on intergovernmental transfers and increasing property taxes at double the rate of taxable property value

growth, city budgetmakers have had to decide which government services to provide, at what level, and how much of the city's resources should be spent on maintaining, improving, and adding to its capital stock. The city's public infrastructure is the subject of the next chapter, and it concentrates on two aspects of the city's capital assets and condition--city streets and the city sewer system. Chapter VI examines the direction or emphasis placed on infrastructure development by elected budgetmakers.

CHAPTER V

THE CITY'S INFRASTRUCTURE

The future of the postindustrial city is shaped, in large part, by the extent to which resources are allocated for the maintenance of its existing public overhead capital. Millions of dollars of public money have been invested in the construction of urban road networks, bridges, sewer and water systems, and public facilities and buildings. These physical assets, which serve the present generation, will also serve the next generations. The costs of constructing the infrastructure are borne by this generation as well as the successive generations because of the long-term nature of bonded indebtedness. Add to the original costs the expense of maintenance and rehabilitation, particularly the high costs that are involved if infrastructure is left to deteriorate badly, and the citizens of the city carry a double burden.

More than dollars for maintenance, rehabilitation, and bond indebtedness are involved in infrastructure decisions. The present and future quality of life in the city is bound by decisions made about its infrastructure. The infrastructure provides the public capital stock for economic redevelopment in a city, and this can be especially important in a city which is declining in job opportunities for its residents.

This study has taken the operationalized concepts of urban decline and fiscal stress and by empirical analysis of the social and economic environment of Knoxville determined that the city exhibits

characteristics of urban decline and fiscal stress. The next major question asked by the study concerns the infrastructure. Has disinvestment occurred in Knoxville's infrastructure? To answer this, the research turns to an examination of the costly investments a city makes in its physical structure, and a determination of the conditions of these physical assets as the city approached the 1980s.

The physical assets to be examined are city streets, roads, and bridges, and the city sewer system. The welfare, safety, and health of the city's residents, as well as that of thousands who travel into the city each day, are dependent on these components of the public infrastructure. The life of these assets are long, some elements such as sewerlines have a useful life of ninety-nine years,[1] but useful life is extended to full term only by maintenance. If street segments are not resurfaced and restored at around the fifteenth year, the quality and safety of the street for travel drops rapidly.[2] Bridges present special hazards for residents and nonresidents traveling in the city. Bridge collapse or accidents caused by narrow widths and inadequate approaches are spectacular and deadly events, but maintenance is a costly and constant expense which goes on unnoticed. Deteriorating

---

[1]Department of Waste Water Control, City of Knoxville, Fixed Assets Classification Plan, by Ron E. Bond, P. E. (Knoxville, TN: Department of Waste Water Control, January 1984).

[2]George E. Peterson, Mary John Miller, Stephen R. Godwin and Carol Shapiro, Guide to Benchmarks of Urban Capital Condition, vol. 3, Guides to Managing Urban Capital, eds. Harry P. Hatry and George E. Peterson (Washington, D.C.: The Urban Institute Press, 1984), 7.

conditions which are not corrected eventually become costly replacement items.

There is another reason for selecting these particular infrastructure systems for examination. These physical assets offer the opportunity to look at how funding sources for maintenance and rehabilitation may effect disinvestment outcome. Sewer systems are generally supported by own-source revenues through service charges. City streets and bridges are maintained through tax revenues. Generally the assets maintained by funds derived from tax sources are the first to suffer from disinvestment as tax revenues grow slowly or are constrained by political decisions. On the other hand, a municipal enterprise that can pass higher costs of operation and maintenance on to the consumer in the form of higher prices, especially if differential quantities can be consumed, are perceived to increase by market-type mechanisms rather than political decisions.

Pagano hypothesized that city outlays for maintenance purposes that are financed from local taxation decrease in fiscally stressed cities, but maintenance outlays for public operations which rely on user charges will not be reflective of the fiscal stress of cities. Differential investment in infrastructure may be traced to the revenue mechanism utilized for financing construction as well as maintenance.[3] The outcome of investment in these two systems of public capital stock which utilize different revenue mechanisms will be reexamined as part of this study.

---

[3]Pagano, 160-161.

In addition, these two systems of infrastructure provide the opportunity to examined federal aid impact on infrastructure. Sewer systems in cities have been aided by federal grants in pursuant of federal policies regarding public water quality. Municipal streets, roads, and local bridges are not subject to a national policy. Though general standards have been promulgated by engineering and public works associations, local government makes the final decision on standards of local streets and bridges. These standards, in practice, have generally been interpreted as, "What can we live with?" This chapter and Chapter VI will explore to an extent the difference in standards between these two infrastructure systems and the impact on the condition of each system.

Data contained in the section on the city sewer system were obtained by an interview with the Director of Waste Water Control and from answers to a questionnaire which is contained in Appendix B. The data on city streets and bridges resulted from interviews with the Director and Deputy Director of the Engineering Department, the Director of the Public Service Department, and answers to the questionnaires included in this study as Appendices C and D.

The Sewer System

Knoxville's sewer system was established as an operating department of city government in 1953. At that time the system, although providing only primary treatment, was deemed adequate to serve the population of the original city. General obligation bonds, totaling

$8,000,000, issued in 1955, 1963 and 1964, financed improvements in the collection and treatment systems, but with the city's 1962 annexation of over 51 square miles, 56,138 people, and the buyout of the Fountain City Utility District, the sewer system doubled its collection lines and average daily flow of waste-water. The sewerage operation had to expand as a result of an expanded territory with more customers.

From 1966 to 1969 over $32,000,000 in bonds were issued to pay for treatment plant construction and collection system improvements. Sewer revenues were pledged as security, but in the event revenues were insufficient, the bonds were additionally secured by ad valorem taxes to be levied by the city on all taxable property within its limits. Due to professional operation of the sewer system, revenues generated from treatment and sewer improvement charges have provided the money for payment of debt obligations, which totaled $62,720,000 by 1980, and the operation/maintenance expenses so that the city's taxes have not had to be raised or funds diverted to pay for the sewer system.

The federal Environmental Protection Agency's grant program for treatment facilities has had a positive influence on the sound financial management of municipally owned wastewater treatment operations, including Knoxville's. Federal laws have provided the incentive and justification for setting rates which would insure self-sufficiency of the wastewater operation.

With the advent of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) and the Clean Water Act of 1977

(Public Law 95-217), the number of wastewater treatment facilities being constructed nationwide increased significantly. While the construction costs for many of the new plants were funded with massive federal grants, no federal subsidies were made available for operating and maintaining the treatment facilities. It was realized by the U.S. Environmental Protection Agency that publically owned sewerage collection and treatment systems would expend more fiscal resources for operation, maintenance, and repair over the lifetime of the facility than the initial investment in capital costs. For these reasons requirements for a user charge system which would insure self-sufficiency of a sewerage operation and provide for replacement of the treatment facility were incorporated in Public Law 92-500 and grants provided under the federal program.[4]

Sewer user charges, pejoratively referred to as the "flush tax" by some, are established by elected officials at the time the sewer department's budget is presented for consideration. City council must approve rate increases, but since an ordinance change in 1974, the mayor may by administrative order increase rates without presenting them to council. The administrative order procedure provides a possible bargaining chip for the mayor with city council will in that the mayor may take the "heat" for sewer rate increases if council will agree to pass property tax increases. On the other hand, rate

---

[4]Environmental Protection Agency, Office of Water Program Operations, Analysis of Operations and Maintenance Costs for Municipal Wastewater Treatment Systems (Washington, D.C.: Environmental Protection Agency, February 1978), I-2 - I-4.

increases by administrative order have enabled the sewer department to finance its debt and its operation and capital budgets at times when the city council opposed tax increases for other general government functions.

The relative financial independence of the sewer system when compared to general fund operations and capital improvements financed through taxes should be reflected in its ability to operate, maintain, and expand its functions and assets according to need even in an environment of retrenchment and cutback. This will be examined in the following section on assessment of the sewer system infrastructure and management strategies for maintenance and expansion of the sewer system assets.

Condition and Maintenance Assessment

Sewer systems are composed of two facility categories. First, the collection system, with its miles of sewerlines and series of pump stations as required by topographical conditions, move wastewater from its residential, business, and industrial origins to the treatment plant, which is the second component of a sewer system. The treatment plant provides primary, secondary and tertiary levels of treatment by screening and grit removal, filtration, sedimentation, digestion, aeration, ammonia removal, chemical treatment, and finally disposal of the sludge by-product.

Knoxville's sewer system reflects the growth of the city's boundaries and the rapid suburbanization of west Knox County which is

served by the sewer collection system of two utility districts but treated by the city under a 1971 contract agreement.

In 1960 the sewer collection system was comprised of 421.5 miles of lines, but after the 1962 annexation and acquisition of the Fountain City Utility District, which served the most populous area annexed, the city's collection system had expanded to 900 miles of sewerlines by 1970. In 1980 there were 1,023 miles of sewer lines collecting wastewater. Over 86 percent of these lines are sewer mains measuring 8 and 10 inches in diameter, and less than 3 percent of all the lines are outside the city's limits. The sewerlines are relatively new, approximately 59 percent having been laid after 1960.

Knoxville has very few combined sewerlines which collect both sewerage and storm water. In 1960 a little over 1 percent of the lines were combined, and by 1980 the percent which carried both sewerage and storm runoff was less than .54 percent of the total. Managers of the city's sewer system consider the absence of combined sewers a blessing in that excess store water during heavy rains burden pumping systems, and would necessitate treatment system by-passes to avoid damage to equipment and flooding of the sewer facilities. Frequent by-passes could also place the sewer operation in danger of violating state and federal mandated discharge permits.

Treatment facilities, both in capacity and treatment levels, have increased as the collection system expanded. In 1960 the city had two plants, Loves Creek and Third Creek, with a combined capacity of 36 million gallons per day (MGD). Construction of an additional facil-

ity in 1966, the Fourth Creek Treatment Plant, and improvements to Third Creek Treatment Plant increased system capacity to 70 MGD by 1970, and complete reconstruction of the Third Creek facility with EPA funds further increased capacity to 80.5 MGD by 1980. Treatment levels advanced from 26 MGD primary in 1960, to 40/30 MGD primary/secondary in 1970, and 40/40/30 MGD primary/secondary/tertiary treatment in 1980.[5] In nominal terms, the treatment facilities were valued at $18,000,000 in 1960, $57,000,000 in 1970, and $110,000,000 in 1980.

Recognizing the economic significance of extraneous water in the sewer systems, the U.S. Congress and the Environmental Protection Agency, in Public Law 92-500, required construction grant applicants to investigate the condition of their sewer systems and show that the collection system discharging into the treatment works was not subject to excessive infiltration and inflow.[6] Federal money was available for these sewer system evaluations, as well as for limited collection system rehabilitation, but in 1980 federal money was being cut in several

---

[5]Primary, secondary, and tertiary levels characterize the extent of treatment wastewater receives before it is discharged into the receiving waters Primary treatment consists of solids removal by screening and grit chambers, and sedimentation usually in heated anaerobic tanks. The sludge by-product is generally wet and difficult to handle for disposal. Secondary treatment accelerates the oxidation processes by the use of forced oxygen in the tanks of waste mix and feeding biota. Disinfection of the final effluent or discharge occurs in both levels. Tertiary treatment involves the reduction of nitrogen and trace elements in the organic waste.

[6]Environmental Protection Agency, Office of Water Program Operations, Handbook for Sewer System Evaluation and Rehabilitation (Washington, D.C.: Environmental Protection Agency, December 1975), I-7.

areas. The EPA grant program shifted emphasis and money almost exclusively to treatment facility improvements and construction. This meant that many problems identified under sewer system evaluation grants, separation of combined sewers, and improvements in collection systems would have to be completed with local funds.

This presented a problem for cities that have poorly maintained sewerlines and a large network of combined sewers. One such city is Cleveland, Ohio, a city which has been classed in several studies as fiscally stressed. Eighty percent of its collection system is combined and aged. The system is plagued with frequent overflows and basement floodings. An estimated $340 million would be needed to correct the flooding problems alone.[7] The cutback in federal aid for collection system rehabilitation hurts this city financially because it forces the repair and rehabilitation to be undertaken through local debt instruments.

Knoxville has not had a history of overflows and flooding sewerlines, partly because of the absence of combined sewers, but a long term strategy of sewerline maintenance and inspection for potential problems has been important for Knoxville. A history of maintenance and inspection become especially important to a city when fiscal stress could result in delayed or reduced maintenance and rehabilitation of its collection system.

---

[7]Humphrey, Cleveland's Capital Plant, 23-25.

Measures to determine the condition of sewer collection systems are not well developed; however, the measures most widely used--if consistently gathered and charted--give managers a good idea of potential trouble areas. The measures are infiltration and inflow testing, gravity flow measures using the Manning formula, and pipe deterioration evident by indirect measures of sewerline failure rates per 1,000 or 100 miles of pipe, measure of hydrogen sulfide accumulation, and inspection by television cameras. Any single measure may be inadequate in itself to determine collection system condition and adequacy, but a combination of measures supplemented by historical records on system failure provide the data base for a maintenance and rehabilitation program.

The most widely used measure of sewer pipe condition are the indirect measures of pipeline failure--sewer backups, blockages, cave-ins, and breaks. Knoxville's Waste Water Control utilizes both internal and external sources of information on sewerline failure. These are inspected by a television camera and public complaints.

Knoxville's sewer system acquired its first sewerline TV equipment in 1975. Its Emergency Services division utilize one camera crew to regularly televise lines. Television inspection involves two steps. First, the lines are cleaned by rodding or flushing. Then the television camera, affixed to a dragline or pulley, is inserted in the sewerline at a manhole station and pulled to the next manhole. Crewmen in the TV truck record and view the images to detect leaky joints and pipeline cracks. It is common practice for cities to use TV

inspection for small sections of the sewer system each year.[8] That is the case in Knoxville also. In 1975, 1978 and 1981, Waste Water Control crews televised 15.9 miles of sewerlines in each year, thus it is estimated that approximately 2 percent of the total system is televised each year.

Citizens complaints about backups and overflows from blocked lines and breaks that emit sewerage or sewer odors are investigated as soon as possible by Emergency Service Crews. Sewer mains that are clogged by roots, grease or debris may be rodded or cleaned by high pressure hydraulics. Backups caused by breaks and cave-ins are turned in on work orders for construction crews to repair.

Waste Water Control records show that Knoxville has had a comparatively low number of backups. As Table V-1 shows, backups average 23.53 per 100 miles of sewerlines. An Urban Institute survey

TABLE V-1

KNOXVILLE SEWER SYSTEM: BACKUPS AND BREAKS PER 100 MILES PIPELINE

Year	Backups	Breaks
1960	24.89	6.00
1970	23.86	2.57
1980	21.83	2.06

Source: Department of Waste Water Control, City of Knoxville.

[8]Stephen R. Godwin and George E. Peterson, Guide to Assessing Capital Stock Condition, vol. 2, Guides to Managing Urban Capital, eds. Harry P. Hatry and George E. Peterson (Washington, D.C.: The Urban Institute Press, 1984), 19.

of 33 cities reveals an average of 8,270 backups per 100 miles of sewerlines. Ogden, Utah, which has the lowest mean of all surveyed cities, at 50 backups per 100 miles is considerably higher than Knoxville's rate.[9]

The same holds true for breaks per 100 miles of pipeline. Table V-1 shows the breaks recorded in 1960, 1970 and 1980. The average is 3.54 breaks per 100 miles of line. The Urban Institute survey previously mentioned found that the mean number of breaks in 21 cities surveyed was 1,430 per 100 miles.[10] Ogden, Utah, again the city with the lowest number of breaks, had a mean of 60 compared to 3.54 in Knoxville. One may conclude that the relative newness of Knoxville's collection system would account for the low number of breaks, but according to the Urban Institute study, sewerline breaks seem to be less related to the age of pipeline than to problems caused by root infiltration, ground movement and poor bedding soils, faulty pipe installation, and inadequate protection from surface weight.[11]

It is evident from the data in Table V-1 that there has been a decline in backups and breaks over the 20 years surveyed. Have improvements in maintenance been the cause? Miles of sewerlines cleaned annually by cities may be used as an indicator for level of maintenance.[12] There has been a significant increase in the miles of

---

[9]Peterson, Urban Capital Condition, 31.

[10]Ibid., 30.

[11]Ibid., 28.

[12]Ibid., 31.

sewerlines cleaned by rodding and hydraulic flushing over this period as shown in Table V-2.

TABLE V-2

KNOXVILLE SEWER SYSTEM: MILES OF SEWERLINES CLEANED

	Years		
	1960	1970	1980
Miles	4.11	107.40	170.44
Percent of Total lines	.97	11.94	16.67

Source: Department of Waste Water Control, City of Knoxville.

A routine of cleaning sewerlines reduced the occurrence of back-ups and blockages. The mean for percent of lines cleaned by 30 city surveyed by the Urban Institute was 26. Clearly, cities that routinely cleaned a high percent of their sewerlines had lower backup rates while cities with the highest backup rates appeared to do the least cleaning. Further, distressed cities, as classified by the Department of Housing and Urban Development UDAG eligibility criteria, carried on the least cleaning.[13] When a city sewer system is able to raise sufficient own-source revenues to cover its operation, maintenance and replacement expenses, even in an environment of fiscal and urban stress, disinvestment need not be the outcome. Sufficient own-source

[13] Ibid., 31-32.

revenues also cushion the fiscal impact of intergovernmental policies that shift or reduce aid transfers from other levels of government.

Cost of Maintenance

With the growth of the collection system and the increase maintenance effort, the costs of maintenance have increased for this component of Knoxville's sewer operation as shown in Table V-3. When the nominal figures are converted to 1972 dollars in order to control for inflation, total dollars and costs per mile of pipeline maintenance decline. It is interesting to note, however, that even though maintenance efforts were low in 1960 and the collection system was about 40 percent of its 1980 size, maintenance costs per mile were high but decline as the system expanded, evidence of the economies of scale in sewer system operations.

TABLE V-3

SEWERLINE MAINTENANCE COSTS: NOMINAL AND 1972 DOLLARS; TOTAL AND PER MILE

	Years				
	1960	1970	Percent Change	1980	Percent Change
Nominal Dollars	$ 79,274	$149,517	87	$258,837	73
Per Mile	188	166	-12	253	52
1972 Dollars	115,392	163,407	42	145,824	-11
Per Mile	274	182	-34	143	-21

Source: Department of Waste Water Control, City of Knoxville.

Sewer treatment charges, which account for over 85 percent of the sewer system revenues, have increased for users as the collection system has expanded, as the treatment capacity has improved, and as maintenance efforts have increased. When the sewer operation was established in 1953, the minimum sewer bill was $ .51 based on 500 cubic feet of water usage. In 1980 the minimum bill was $3.60 based on 400 cubic feet of water usage.

The rate schedule for normal strength wastewater treatment is a graduated rate calculated on 100 percent of the water used. The rate structure, approved by the federal Environmental Protection Agency, reflects the improvements in treatment capacity of the Knoxville sewer system and the need to recover replacement costs necessary for a valuable asset. Table V-4 charts rate increases in selected years for the majority of residential users of the system.

It is evident how bond indebtedness and improvements in the collection and treatment systems increased the sewer rates from 1953 to 1966. Although all rate increases are not shown, after 1966 rate increases are more moderate, but sufficient to cover inflation in operation and maintenance costs and bonded indebtedness incurred for construction and improvements of treatment facilities.

Summary of the Sewer System

By all indications the city-owned sewer system in Knoxville is not in deteriorated condition, nor is there a costly backlog of rehabilitation work. Data on the collection system indicate that maintenance has been standard practice, and it has not diminished even though the city

TABLE V-4

SEWER TREATMENT CHARGES, SELECTED YEARS

Customer	Water Usage, CF	1953 Treatment Charge	1966 Treatment Charge	Percent Change	1974 Treatment Charge	Percent Change	1980 Treatment Charge	Percent Change
Minimum Bill	400	$ .51	$1.60	214	$ 2.52	58	$ 3.60	43
Residential	800[a]	.92	2.92	217	4.72	62	6.88	46
Residential	1,200	1.48	4.24	186	6.92	63	10.16	47
Residential	2,000	2.60	6.88	164	11.32	65	16.72	48

[a]Sixty-seven percent of sewer customers use 800 cubic feet or less of water.

shows evidence of fiscal stress. Treatment capacity and level, once a problem, has been corrected by the reconstruction of the Third Creek Treatment Plant, financed in large part by federal funds.

There are several reasons for the good condition of the sewer infrastructure. It has grown in both miles of collection lines and in treatment level and capacity from 1960 to 1982. The sewer system benefitted from annexation, in that it was able to expand beyond the old city limits thus capturing new rate payers in the areas annexed. It has also been the beneficiary of federal Environmental Protection Agency funds for reconstruction of its largest treatment plant, and federally mandated regulations concerning user charges sufficient to cover operation, maintenance, and replacement of the system have added to its ability to generate needed revenues. In addition, after 1965 sewer system capital improvements have been financed by revenue/general obligation bonds which bear covenants requiring elected officials to set rates sufficient for the operation, maintenance, and debt service of the enterprise. These latter two requirements concerning user charges are strong incentives for the city to operate the sewer system as a self-supporting entity. The nature of sewer user charges have also been a factor in self-sufficiency. User charges that allow for differential pricing based upon consumption aid rate setting by appearing to be market-set price rather than a decision made by the council or mayor.

City streets, roads, and local bridges, however, are open to use by all who travel in the city without charge, and rehabilitation

financing differs from that of the sewer system. The next section investigates the condition of the elements of this infrastructure network.

Streets and Roads

The urban street network in Knoxville has grown in miles as has the city's sewer system. The growth from 1960 to 1970 was the result of the 1962 annexation. Approximately 95 percent of the 408 additional miles were annexed streets, while private development contributed to the city account for the remaining 5 percent. Growth from 1970 to 1980 can be attributed to residential development in the city's western area which was part of the 1962 annexation. Of the 52 miles added to the city's street inventory from 1970 to 1980, 90 percent was accounted for from private development. Four percent of the additional streets were added by the state government; 4 percent by the city, and only 2 percent from annexation.

Figure V-1 shows the miles of urban streets, classified in the use categories of arterial, collector and residential, in 1960, 1970 and 1980. Residential streets, which comprise about 80 percent of all street in the nation's cities, made up most of the increases. After 1970 the city's arterial and collector network remained in its present configuration.

Condition and Maintenance Assessment

Street inventory, condition assessment, and maintenance are now shared by two city departments. Until 1979 one department, the

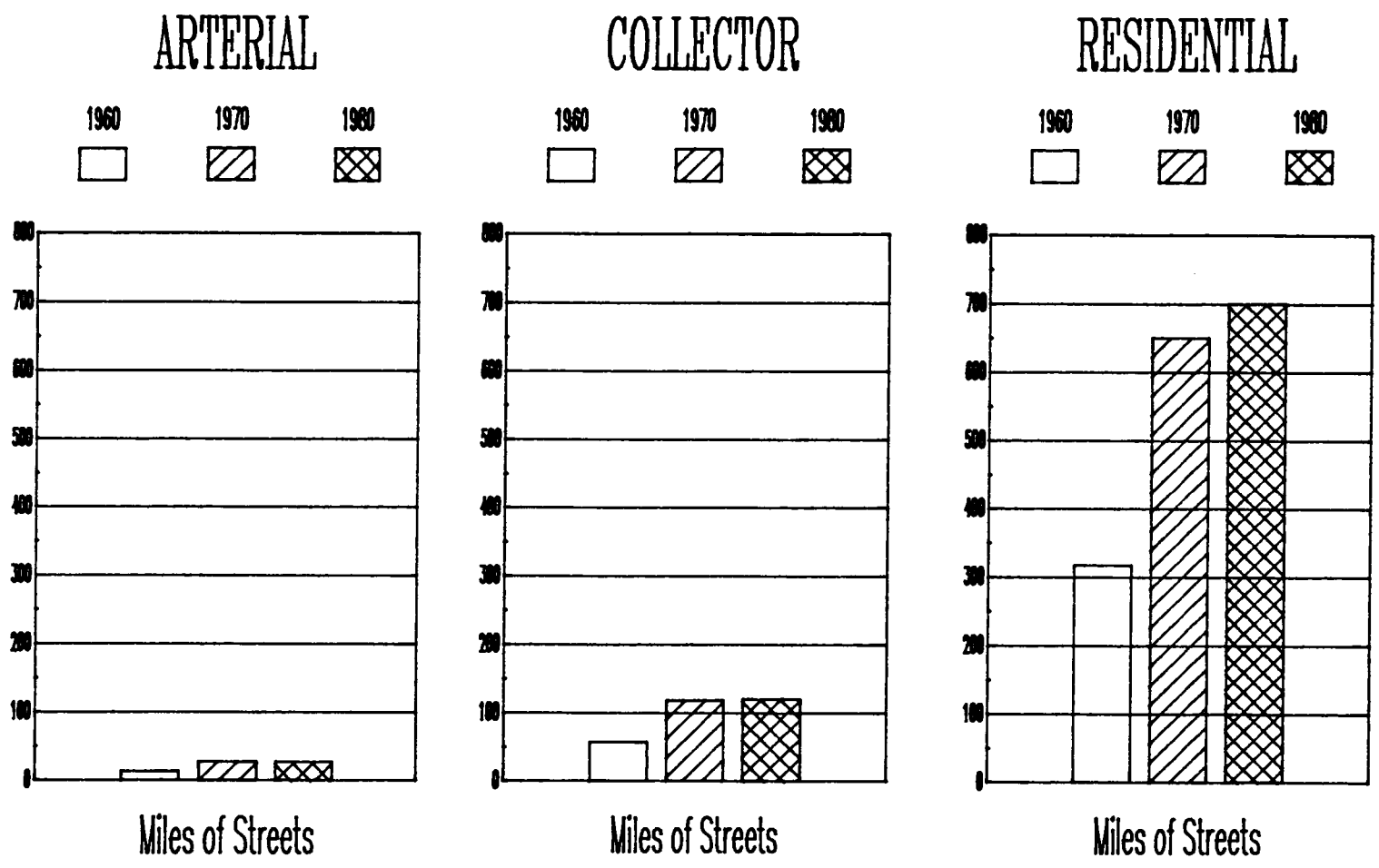


FIGURE V-1. CITY OF KNOXVILLE: MILES OF URBAN STREETS, 1960, 1970, 1980.

Public Service Department, was responsible for engineer and design work on city streets, roadway construction inspection, administration of the State Street Aid fund, and maintenance of streets, roads, drainage and storm systems, and local bridges. In 1979 the engineering function was separated into a department responsible for engineer and design work of public streets, construction inspection, and traffic engineering. This department was also responsible for administering contracts for major street reconstruction and repaving. The Public Service Department retained control of the State Street Aid fund and administers it by supervising the maintenance crews and scheduling the work done out of these funds. Accounting for State Street Aid funds spent is also the responsibility of the Public Service Department. The working relationship between Engineering and Public Service is cooperative and work orders are initiated by either department.

During the time period covered by this study there was not a systematic inventory of city streets for condition or paving history, but a computerized street management program has since been purchased by the Engineering Department and street data are being installed. Thus records of condition assessment of Knoxville streets are not available for 1960, but for the purpose of this research, the Engineering Department reviewed early pavement program contracts in order to interpolate street condition in 1960. The condition of the streets in 1970 and 1980 are based on available paving program records. The city's Engineering Department was asked to rate streets according to descriptive conditions defined by the Federal Highway

Administration. These definitions are presented in the questionnaire listed as Appendix C. The ratings supplied by Engineering show a modest decline in collector street condition from 1970 to 1980, but a more significant decline in residential street condition.

Figure V-2 shows the number of miles of city streets classified as very poor, poor, fair, good and very good in 1960, 1970 and 1980. In Figure V-3 the conditions of street miles are converted to percent of total miles. The decline of streets assessed as very good and good is noticeable in 1980, as well as the concurrent increase in streets judged as fair and poor. Engineering Department personnel were asked to rate street conditions good, fair or poor by the functional categories of arterial, collector and residential. Street conditions decline in all three functional categories from 1970 to 1980 as shown in Figure V-4, but to imply that Knoxville's streets are worse than some national average is difficult.

One of the problems with nationwide assessment of urban infrastructure and estimates of needs is the fact that much data are left out, or, if included, are not comparable because of the basis for gathering the data. This is a problem when generalizing or comparing funding needs for local streets, roads, and bridges. The Federal Highway Administration's biennial needs survey rates interstate highways and arterial and collector roads. Local streets, or residential streets, which comprise 65 to 80 percent of the mileage of all roads in the urban network are not rated.[14] Residential streets in Knoxville

---

[14] Ibid., 7.

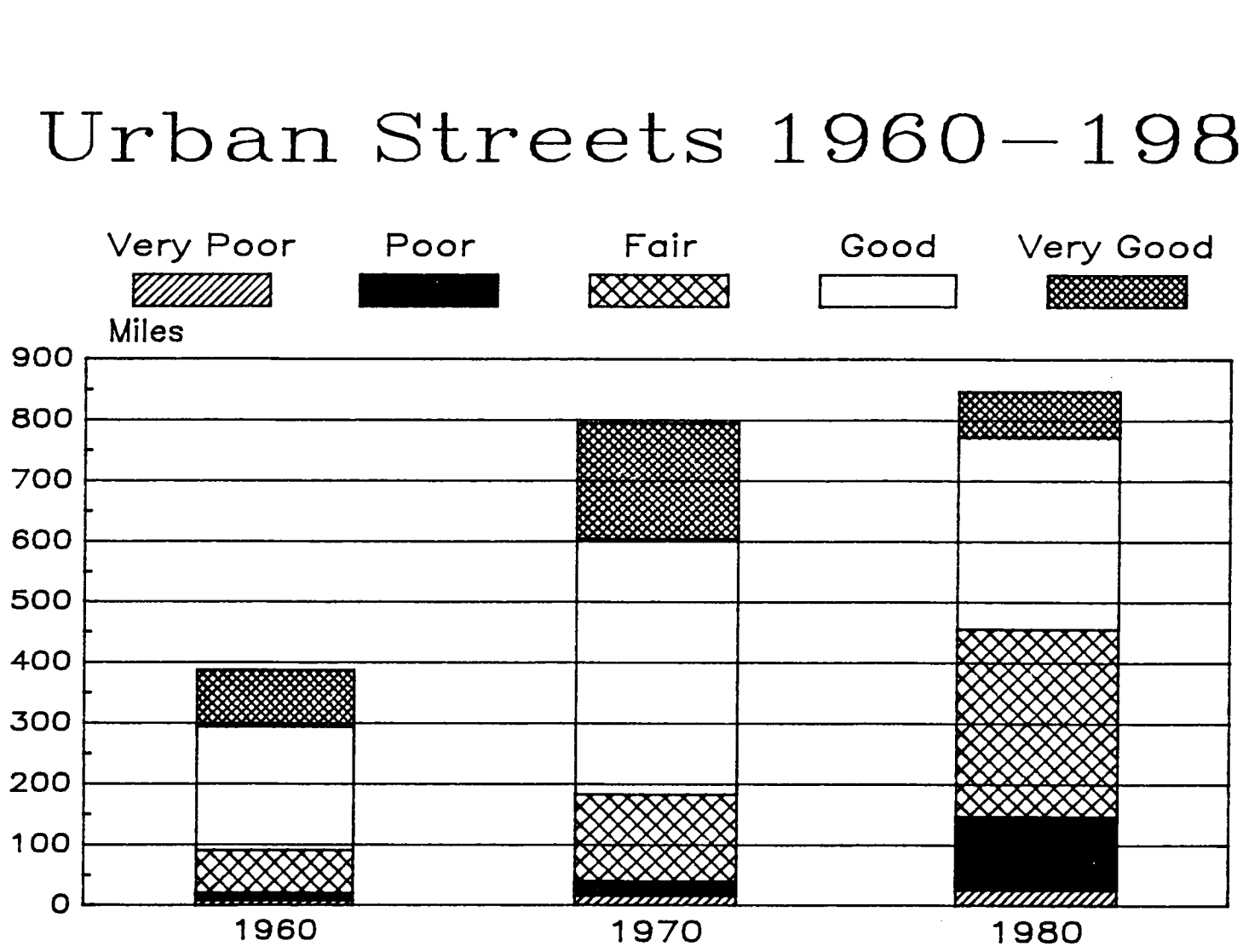


FIGURE V-2. CITY OF KNOXVILLE: MILES OF URBAN STREETS CLASSIFIED AS VERY POOR, POOR, FAIR, GOOD, VERY GOOD--1960, 1970, 1980.

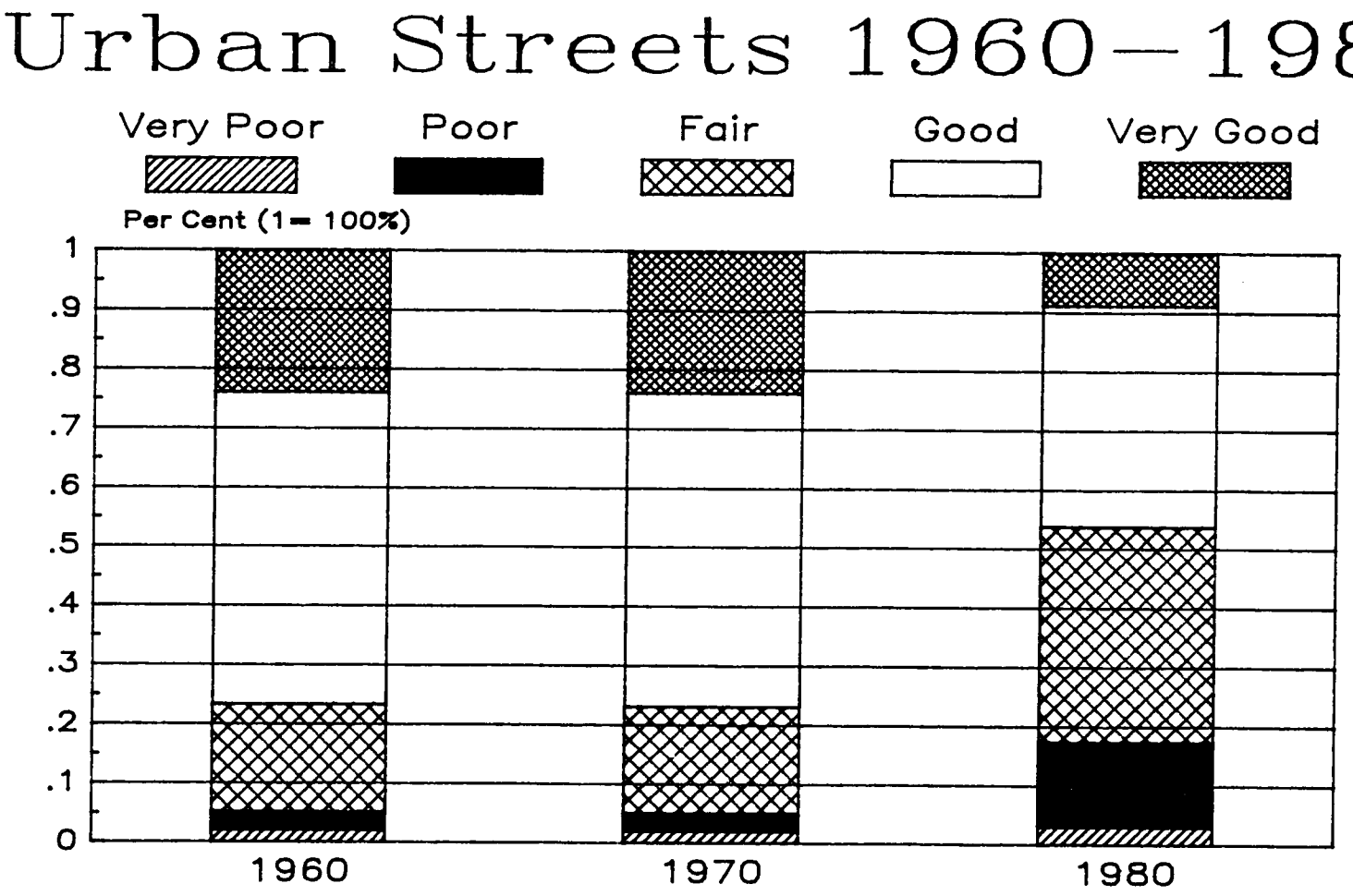


FIGURE V-3. CITY OF KNOXVILLE: PERCENT OF MILES OF URBAN STREETS CLASSIFIED AS VERY POOR, POOR, FAIR, GOOD, VERY GOOD--1960, 1970, 1980.

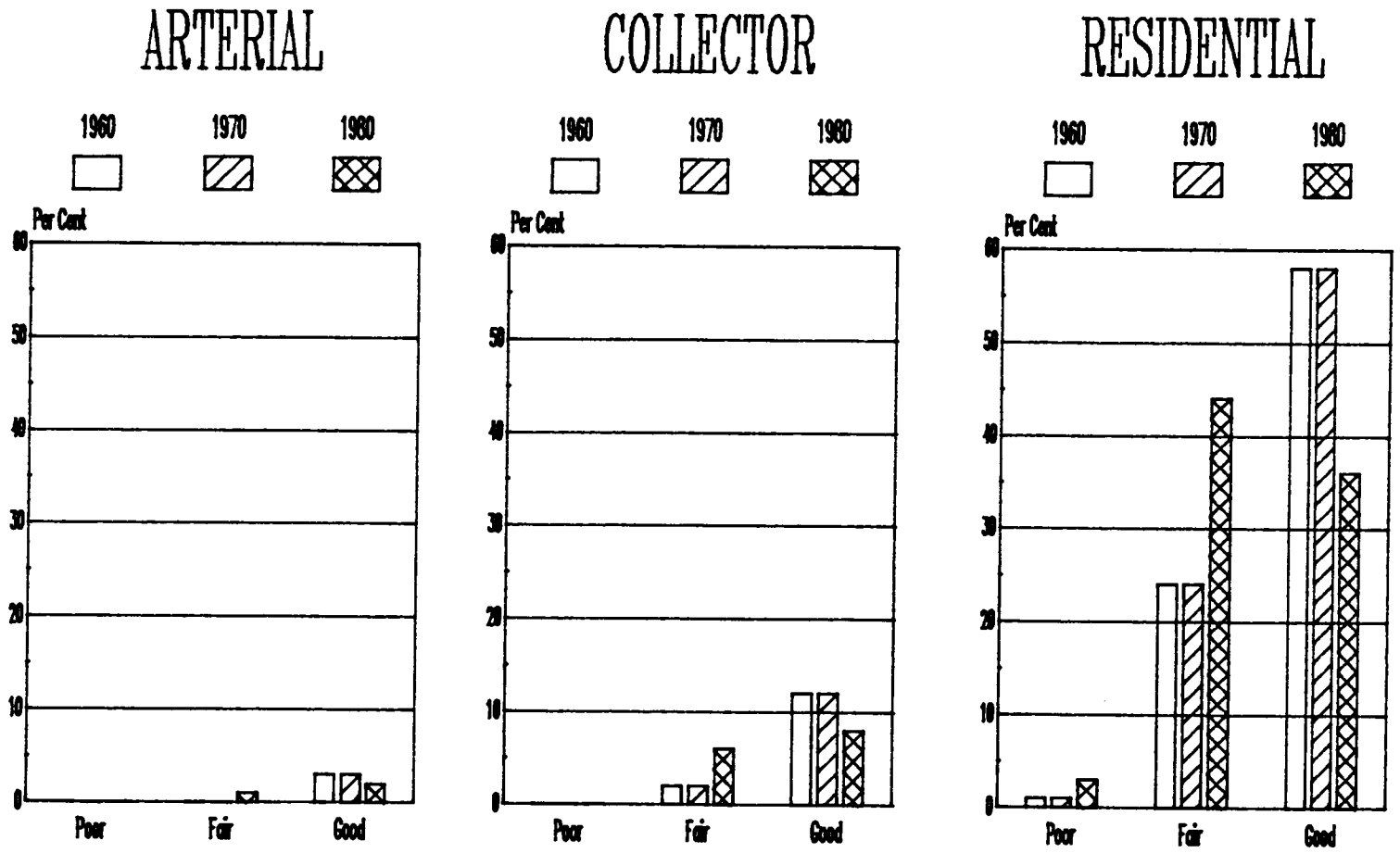


FIGURE V-4. CITY PAVEMENT CONDITION: PERCENTAGE OF MILES CLASSIFIED AS POOR, FAIR AND GOOD.

comprised 83 percent of all its road mileage in 1980. This study has included local streets in the assessment of condition and needs, thus any effort to generalize or compare to a broad survey is restricted to the 17 percent of road network which would be included in an FHWA survey.

In Table V-5 an attempt has been made to provide some comparable data for the condition of Knoxville's arterial and collector roads in 1980 with those of cities included in an Urban Institute Study.[15] Good, fair and poor ratings of the 26 cities for which data were available were averaged, and ratings of Knoxville's arterial and collector roads are shown below the survey average. Arterial and collector roads in Knoxville appear to be in better condition than the survey average, but no comparable data are available for residential streets. Residential streets, in the Knoxville study, suffered a disportionate share of total disinvestment in maintenance and repavement by 1980.

Residential streets carry only 20 to 15 percent of urban traffic, and the condition of residential streets are not subject to any uniform rating standard. The standard for residential streets is a local matter. These are the easiest streets to cut from a citywide paving program, and a local street has not been included in any paving contract let by the city of Knoxville since 1976.[16] In this study residential street needs comprise the bulk of estimated rehabilitation costs.

---

[15] Ibid., 9.

[16] Robert Bowers, Director of Engineering Department, City of Knoxville, Interview by author, May 27, 1987.

TABLE V-5

PERCENT RATINGS FOR ROADS FOR CITIES IN SAMPLE AND FOR KNOXVILLE, 1980

City	Percent Ratings		
	Good	Fair	Poor
Albany	57.4	37.5	5.1
Atlanta	59.7	39.7	0.6
Baltimore	57.0	41.0	2.0
Billings	16.2	80.9	2.9
Boston	88.6	11.4	0.0
Buffalo	9.0	80.5	10.5
Detroit	72.1	16.1	11.8
Eugene	60.9	25.8	13.3
Hampton	63.1	28.8	8.1
Lexington	24.3	73.1	2.6
Lincoln	47.5	50.7	1.8
Louisville	19.6	63.4	17.0
Miami Beach	28.1	55.1	16.8
Minneapolis	29.8	65.8	4.4
New York City	54.0	41.3	4.7
Ogden	42.9	56.3	0.8
Phoenix	44.8	54.0	1.2
Pittsburg	26.5	58.5	15.0
Portland	49.9	45.2	4.9
Rochester	27.6	60.1	12.3
San Diego	62.4	35.1	2.5
Scranton	7.6	89.6	2.8
Sioux Falls	15.5	62.6	21.9
Tucson	54.5	34.4	11.1
Wilmington	16.1	59.0	24.9
Worcester	96.9	3.1	0.0
AVERAGE	43.5	48.8	7.7
Knoxville	57.8	40.1	1.4

Source: George E. Peterson, Mary John Miller, Stephen R. Godwin and Carol Shapiro, Guide to Benchmarks of Urban Capital Condition, vol. 3, Guides to Managing Urban Capital, eds. Harry P. Hatry and George E. Peterson (Washington, D.C.: The Urban Institute Press, 1984), 9, and Engineering Department, City of Knoxville.

Cost of Maintenance

The responsibility for repair and maintenance of Knoxville streets is almost entirely the city's; only 8 percent of street miles within the city limits are repaired and maintained by the state. Funds for street maintenance come from capital improvement bond funds repaid through property taxes, state street aid which is a designated portion of the gasoline tax turned back to local jurisdictions, and some special projects funds such as CDBG money spent in target areas.

For the purposes of determining costs of street restoration and repavement and to find out if there were unmet needs in street maintenance, Engineering Department personnel were asked to estimate costs per square yard to repair and restore city streets classified as fair, poor and very poor. The estimated costs are shown in Table V-6. Using other data supplied by Engineering, estimated costs to repair streets in the use categories of arterial, collector and residential were calculated. The assumptions and formulae for

TABLE V-6

ESTIMATED COSTS PER SQUARE YARD TO REPAIR AND RESTORE CITY STREETS

	Unit Estimates (Sq. Yd.) by Year		
Rating	1960	1970	1980
Fair	$ .24	$ .40	$1.42
Poor	.36	.60	2.13
Very Poor	.60	1.00	3.55

Source: Engineering Department, City of Knoxville.

calculating street mile costs are provided in Appendix E. Miles and actual repair expenditures were then compared to the estimates in order to determine the unmet needs.

The results are shown in Table V-7, and the most notable revelations are the estimated costs to repair streets which were classified as less than good in 1980, and that in 1980 no money was spent on these streets. Residential streets, which comprise the greatest number of miles for total streets, were the worst in need, but collector streets, which are traveled daily as feeders from residential areas to main arteries were beginning to show deterioration and loom as a large expense item. It should be noted that cutbacks in repair and repavement started in 1970.

Table V-7 does not show estimated repavement costs or miles for streets rated as very poor, but in 1960 actual expenditures for very poor streets amounted to $400,000. In 1970, $800,000 was spent on very poor streets in Knoxville. It is evident that by 1970 all needed street restoration and repavement could not be accomplished so choices had to be made.

Summary on City Streets

Through the years covered by this study, Knoxville had no systematic program for assessing the needs or presenting a phased program for restoration and rehabilitation of city streets.[17] Data provided by the city Engineering Department in response to the

[17] Ibid.

TABLE V-7

ESTIMATED COSTS TO REPAIR AND RESTORE STREETS BELOW RATING OF GOOD AND ACTUAL EXPENDITURES

Use Category Rating	1960		1970		1980	
	Miles	Cost	Miles	Cost	Miles	Cost
Arterial						
Fair	0	$ 0	0	$ 0	0	$ 239,773
Poor	0	0	0	0	0	0
Collector						
Fair	9	40,555	16	120,164	53	1,413,058
Poor	0	0	0	0	2	79,984
Residential						
Fair	91	333,146	200	1,219,891	371	8,033,289
Poor	5	45,762	11	100,641	24	779,510
Total Estimated Cost		419,463		1,440,696		10,545,614
Total Expended		400,000		800,000		0
Total Miles Below Good Rating	105		227		456	
Total Miles Repaired Below Good Rating	180		157		1	

Source: Engineering Department, City of Knoxville.

questionnaire indicate that at the beginning of the 1980s, Knoxville's streets were showing signs of neglect. The portion of streets rated very good and good have decreased as streets rated fair and poor have increased. The bulk of streets which are neglected, however, are residential streets which comprise the largest percent and the most mileage of city street totals.

A comparative analysis of Knoxville's arterial and connector roads with a survey of other cities shows that these street categories are not any worse off than the average ratings for the 26 cities. The specific data for Knoxville does reveal a slippage of some connector streets from good condition to fair.

When estimates are gathered to assess the costs of a backlog of street maintenance and restoration, the estimates amounted to $10.5 million in 1980. The largest share of estimated costs was for 396 miles of residential streets which were in fair or poor condition. Fifty-five miles of collector streets in fair and poor condition would need $1.5 million for repairs. It should be made clear that these estimate, though based on figures for unit costs supplied by the Engineering Department, were arrived at independent of the city department. The purpose of an independent estimate was to determine the extent of need and the street category most in need of repair if all were equal. Streets, however, are not treated equal. The priority is on downtown streets and arterial streets. Connector streets are third in line for repairs. Residential streets are last in a priority ranking for repairs.

Local Bridges

The Federal Highway Administration estimates that there are over 200,000 bridges across the United States which are structurally deficient or functionally obsolete, yet records of bridge condition are incomplete in most cities and responsibility for repair and maintenance are the subject of jurisdictional disputes. Bridge accidents, however, are dramatic events which usually result in immediate and emotional appeals for corrective actions.

Bridges within a city's limits may have been built and are maintained by the federal, state or local government, as well as by railroad companies. In some cases responsibility is shared for the maintenance and upkeep. In this section, bridges which are under the federal and state governments and railroad jurisdictions are excluded from the inventory assessment.

The number and combined length of bridges within the city limits of Knoxville are shown in Table V-8. The jurisdiction responsible for maintenance and repair of these bridges is also shown. The increase

TABLE V-8

CITY OF KNOXVILLE: BRIDGE AND JURISDICTIONAL RESPONSIBILITY, 1960, 1970 and 1980

	1960		1970		1980	
Jurisdiction	Number	Total Yards	Number	Total Yards	Number	Total Yards
City	4	1,445	66	2,307	67	2,357
State	10	661	16	1,058	16	1,058
City/Railroad	1	29	1	29	1	29
Totals	52	2,135	83	3,394	84	3,444

Source: Engineering Department, City of Knoxville.

in bridges within the city limits in 1970 over 1960 occurred because of Knoxville's acquisition of 51 square miles in its 1962 annexation of adjacent territory.

Condition and Maintenance Assessment

The soundness of a bridge relates to its structural condition and its ability to serve the traffic demands placed upon it. Factors which affect bridge condition and contribute to deficiencies are the age of the bridge, maintenance level, traffic loading, climate and design. A bridge may have a sound structure but still be deficient because the traffic it currently handles is more than its design capacity.[18] Thus bridge deficiencies are categorized as structural and functional.

A structurally deficient bridge is one that has been either restricted to light vehicles by weight posting or closed because of structural inadequacies in the deck or supports. A survey by the Urban Institute has found that structurally deficient bridges are most common in the northeast. The factors which contribute to this are the age and climate. Bridges which were built more than 50 years prior to 1980 are concentrated in the northeastern region. In addition, the cold winters and snow in the northeast require extensive salting of roadways and bridges. Salt spreading can cause serious damage to bridge decks in a period as short as four years. The Urban Institute

---

[18]Peterson, Urban Capital Condition, 15.

study also found that the majority of structurally deficient bridges are in declining and fiscally distressed cities.[19]

A bridge which is functionally obsolete is one that has a deck geometry, approach, roadway alignment, or load-carrying capacity that can no longer safely service the road system. The Urban Institute study cited above, found that functionally deficient bridges are common in the south. These are most likely found in growing cities and in cities that are fiscally distressed.[20]

Table V-9 is a reproduction of figures from the Urban Institute study, and presented here for the purpose of comparing bridge deficiencies in Knoxville. According to the data presented, the south has an average percent of 10.7 structurally deficient bridges and 15.9 percent functionally obsolete bridges in 1980. In that same year, only 4 percent of Knoxville's bridges were classed as structurally deficient, but 52 percent of the city's bridges were functionally obsolete. Table V-10 shows the distribution of deficient bridges in the city.

The data demonstrate that city growth as well as the daily influx of suburbanites to the city to work have rendered most of the city's bridges obsolete. In light of the findings in Chapter IV, that Knoxville fits the characteristics of a fiscally distressed city, it is not surprising to find a large number of the city's bridges in the functionally obsolete category.

---

[19] Ibid., 16.

[20] Ibid.

TABLE V-9

BRIDGE NEEDS BY REGION

Regions	Average Percentage of Bridges Structurally Deficient	Average Percentage of Bridges Functionally Obsolete
Northeast (N = 12)	25.3	4.7
North Central (N = 17)	15.5	12.8
South (N = 18)	10.7	15.9
West (N = 15)	4.9	10.0

Source: George E. Peterson, Mary John Miller, Stephen R. Godwin and Carol Shapiro, Guide to Benchmarks of Urban Capital Condition, vol. 3, Guides to Managing Urban Capital, eds. Harry P. Hatry and George E. Peterson (Washington, D.C.: The Urban Institute Press, 1984), 17.

TABLE V-10

CITY OF KNOXVILLE: BRIDGE NEEDS AND JURISDICTIONAL RESPONSIBILITY, 1960, 1970 and 1980

	1960		1970		1980	
Jurisdiction	Structural Deficient	Functional Obsolete	Structural Deficient	Functional Obsolete	Structural Deficient	Functional Obsolete
City	0	5	0	15	3	35
State	0	0	0	0	1	1
Totals	0	5	0	15	4	36

Source: Engineering Department, City of Knoxville.

When the number of structurally and functionally obsolete bridges are classified by traffic usage, 40 percent of the functionally obsolete bridges carry from 2,000 to 10,000 vehicles each day. Table V-11 also shows that 9 percent of the functionally obsolete bridges that cannot adequately or safely carry traffic demands that are placed upon them are heavily traveled routes into the city.

TABLE V-11

AVERAGE DAILY TRAFFIC OF DEFICIENT BRIDGES BY JURISDICTIONAL RESPONSIBILITY, 1980

Average Daily Traffic Per Bridge	Structurally Deficient		Functionally Deficient	
	City	State	City	State
Greater than 10,000 vehicles	0	1	3	1
2,000 to 10,000 Vehicles	0	0	14	0
Less than 2,000 Vehicles	3	0	18	0
Totals	3	1	35	1

Source: Engineering Department, City of Knoxville.

Cost of Maintenance

There are not available data on the costs of specific bridge repairs or estimates on future expenditures. Specific figures used in this study are from recall by the Deputy Director of the Engineering Department. The lack of data is symptomatic of the absence of a

systematic process to regularly evaluate and estimate needs of city bridges. Preventive maintenance, or regularly scheduled maintenance, is not carried out. Repair is done on an emergency basis. For example, when a bridge railing is struck by a car, maintenance crews from the city's Public Service Department are dispatched to repair or replace the rail. About $10,000 or less is spent each year by the city on bridge maintenance.[21]

The only expenditures to exceed $10,000 from 1960 to 1982 was $583,815 in 1978 and $30,000 in 1981. In 1978 the Gay Street Bridge was painted, and modifications to the Clinch Avenue Viaduct for the 1982 World's Fair prompted the expenditure in 1981. There are not any plans pending for replacement or construction of any bridges under the city's jurisdiction, thus there is a lack of data in this study on estimated bridge needs.

Summary on Bridges

The problem with bridges in Knoxville is one of obsolence rather than structural unsoundness. Forty-nine percent of the city's bridges carry more traffic than their width and approach design can safely and conveniently accommodate. The results are the nuisances of traffic bottlenecks, but there are no plans to reconstruct these bridges.

Expenditures on bridges are for emergency repairs, principally resulting from vehicles tearing into guard rails. Pothole filling and

---

[21]Stephen King, Deputy Director of Engineering Department, City of Knoxville, Interview by author, May 27, 1987.

pedestrian walkways on major bridges are other frequent repairs. Because of the nature of bridge deficiencies, nuisance rather than positive danger, bridges receive little attention in the capital budgeting process.

Summary and Conclusions on the Infrastructure

As hypothesized in other research, the condition of two distinct categories of infrastructure in Knoxville affirm that there are differences in outcomes for infrastructure investment depending upon the source of funds for maintenance and rehabilitation. The city sewer system which derives its funds from user charges and revenue guaranteed bonds is in good condition. Streets, roads and bridges, taken collectively, are not in as good a condition as the sewer system. There is a backlog of needs for city streets, road and bridges, and these needs have to be met by increasing the city's full faith and credit debt which is dependent upon the property tax resources of the city. These structures--streets, roads and bridges--are also open for use by all who travel in the city, and, for practical reasons, are not subject to differential charges.

The sewer system has also been the beneficiary of federal aid in pursuant of a federal policy to protect the quality of public water. City streets, road and bridges are not held to a national standard of performance--standards are local decisions.

Though the city sewer system was impacted by inflation in both the operation and maintenance function and construction costs, the

federal government, as a condition for receiving grants in aid, imposed regulations on local governments to establish rate structures and policies that would ensure the self-sufficiency of the wastewater collection and treatment systems. Revenue guaranteed bond covenants also require the establishment of rates sufficient to pay operation and maintenance costs and the indebtedness of the facilities.

On the other hand, inflation has effectively decreased the intergovernmental aid funds received by the city from the state for street repairs, but inflation has increased the costs of repairs. A systematic, incremental program for the annual evaluation, estimation, and presentation of street, road and bridge needs has not been the rule in Knoxville, consequently street and bridge restoration are brought up for funding project by project and major repairs are on an emergency basis.

When there is not an established program for the rehabilitation of city streets and bridges, it is easier for elected officials to put off street paving and bridge repairs when fiscal constraints necessitate cutback decisions. The ability of city officials to put off street and bridge maintenance and restoration is enhanced by the lack of required reserves for replacement of this type of infrastructure and by the lack of enforceable standards regarding the condition.

CHAPTER VI

BUDGET TAXING DECISIONS

This chapter is based on the proposition that elected officials make decisions to raise taxes, or to incur greater debt exposure, as a means for providing the same level or increased levels of service. Moreover, these officials make decisions to raise taxes, or to reduce service levels, as a means to balance the city's revenues with its expenditures. The proposition further acknowledges that budget decisions are made in an environment of competing demands for a city's resources. Pressure for investment in infrastructure, whether voiced through a mayor, a department administrator, or an interested party, is only one of many competing demands for budget appropriations.

The previous chapter examined three elements of the city's infrastructure: city streets and roads, bridges, and the sewer system. It was concluded that those streets, roads, and bridges which are maintained by the city through discretionary general funds, bonded indebtedness secured by ad valorem taxes, or intergovernmental revenues have suffered from significant disinvestment. By contrast the sewer system, which is supported by own-source revenues, has been able to support a maintenance and construction program which has improved its capacity and useful condition.

What competing demands in the budget allocation process lead to disinvestment in the city's streets, roads, and bridges but provided for heavy investment in the sewer system? This question is basic to

Chapter VI which will examine the issues surrounding revenue changes to meet appropriated budgets, trends in capital expenditures away from city streets, roads, and bridges, and the role of intergovernmental transfers and grants in the investment or disinvestment equation for urban infrastructure. This question must also be analyzed in terms of urban decline and fiscal stress--two key concepts in the model of urban infrastructure disinvestment. Did urban decline and fiscal stress contribute to decisions to disinvest in the city's streets, roads, and bridges?

The first part of Chapter VI describes the political environment in which budget decisions are made. The second section looks at incidences of local revenue changes during the period from 1960 to 1982, and the public justifications for new tax revenues. The third section reviews the capital expenditure record during the administrations of four city mayors for discernable emphasis on capital expenditures, and for influence on capital expenditure decisions from other levels of governments.

The Political Environment

Public infrastructure has been built and maintained in response to needs generated by the public and acted upon by elected officials. In a political sense the infrastructure itself is not intrinsically valuable to elected officials; but the benefits derived from the construction, use, and maintenance of an infrastructure network are important. One need only review the political history of big city bosses such as

William Marcy Tweed, George B. Cox, and the Kelly-Nash machine to understand the political value of infrastructure development. Today, infrastructure development still has political value for elected officials in providing for visible vote solicitation or acknowledgement of electoral support. Depending upon the specific project, the beneficiaries include groups such as land developers, contractors, or businessmen, as well as neighborhoods or districts. The point to be emphasized is that there are political benefits in addition to general public benefits derived from capital expenditures on public infrastructure.

Political benefits, however, are also derived from the expenditure of public funds for social welfare services, whether it is for police and fire protection, library services, indigent hospital care, recreation services, education, or garbage collection. These activities have interested constituents both inside and outside the government circle, and represent both recipients and providers of the service. As noted in Chapter II emphasis on social programs, beginning in the 1960s, has shifted money away from capital investment programs. Inflation during the 1970s and early 1980s has also played a part. Increased costs of construction materials and the increase in the labor costs of force account maintenance have worked against public infrastructure investment at the same time that social welfare functions carried on by the city have increased dramatically due to inflation, as well as other factors which generally come under the heading of urban decline.

Knoxville, the setting for this study on infrastructure disinvestment, is a home rule municipality governed by a strong mayor-council

system. The mayor is the chief executive officer, and is elected by direct vote in a nonpartisan election every four years. The council consisted of seven members during the first nine years encompassed by the study period, but was expanded to nine members in 1970. Members are elected on a nonpartisan basis for four year terms which are staggered so that four are elected at one biennial election. The council has a sectional bias in that six members are elected from districts and three are members-at-large.

From 1960 to 1982 there have been four Knoxville mayors, two of whom were elected for second terms. The council has been less stable with 34 different council members having been elected from 1960 to 1982. Fifteen of those elected served for only one term, and seven served for a half-term or two years. Only nine council members served two or more terms in office. Six of those reelections occurring during the last ten years of the study.

A simple answer is not available for the high turnover of council members, nor is it known to what extent council shapes the revenues and expenditures for the city. Local newspapers, however, frequently cite that fear of losing a reelection bid prompts council members to vote against a budget which carries with it a tax increase. But past votes for tax increases have been cast by council persons who were up for and who won reelection, thus the record is unclear. Council's influence on budget expenditures and tax increases are minor compared to that of the mayor who proposes the budget and taxing agendas. Councilpersons act more as transmitters of dissent from constituents or

groups who have objections to the budget; however, council support for tax increment budgets is evidenced by the fact that a majority of votes has never been raised to reject a tax increase proposed by the mayor.

To what extent then is the mayor able to propose and obtain approval of a budget for general government operations, social welfare services, and capital improvements? This question is put forth here because of the need to determine if infrastructure investment or disinvestment decisions were made in particular or if the decisions were part of the environment of fiscal stress and urban decline. The mayor's influence is limited in city budget-making. Salanick and Pfeffer have cited three major restrictions on mayoral discretion.

The first restriction relates to the environment and organizational influences on the mayor. These influences are size of the city, its economic base, the characteristics of its population, the city's political condition, and its form of government.[1] A number of the environmental influences mentioned above have been used in the model of infrastructure disinvestment.

A second restriction on the city mayor comes from the general environment of the nation which include inflation rate and the general national unemployment rate. Policies which originate from the national political level but impact city hall policies also come under this general

---

[1]Gerald R. Salanick and Jeffrey Pfeffer, "Constraints on Administrator Discretion: The Limited Influence of Mayors on City Budgets," Urban Affairs Quarterly, vol. 12, no. 4 (1977): 480.

restriction. These would include tax policies, revenue sharing policies, and environmental quality policies which mandate local compliance.[2]

The third source of constraints on mayoral initiative and discretion is the general tendency for political leaders, including mayors, to share power with other groups. In a city these other groups include city employee unions, commercial and business interests, community organizations, and other political leaders.[3]

From their research, Salanick and Pfeffer found that the impact of city mayors on variations in the budget is relatively small, especially when compared to the effect of the city itself. The city effect includes all factors associated with a particular city, including regional and state characteristics.[4] With regard to capital outlays, however, the mayor has the greatest effect in absolute dollars spent and as a proportion of the total dollars spent in the city budget.[5]

These findings then will support a thesis that budget decisions and subsequent taxing measures to fund a budget are shaped very strongly by the environment of the city itself, but that the emphasis or direction of capital expenditures are controlled to some extent by the city mayor. For this reason, when capital expenditures made during the period from 1960 to 1982 are examined, they will be grouped in years that correspond to mayoral administrations. This grouping will demonstrate an emphasis on certain kinds of

---

[2] Ibid.

[3] Ibid., 481.

[4] Ibid., 488-489.

[5] Ibid., 492.

infrastructure investment which lead to a disinvestment in city streets, roads, and bridges. The grouping of mayoral administrations also lend to the analysis of expenditures in relation to the city's environment and the prominence of governmental policies from other political levels.

From this descriptive setting of the environment and influences which effect a city budget, this study moves to an examination of the budgets passed and incidences of property tax increases and sales tax measures enacted to fund the operations and debt of Knoxville.

Decisions on Taxing and Spending

The general fund budget for Knoxville city government has continually increased over the study period. In 1960 per capita general fund expenditures amounted to $156; in 1980 the per capita expenditure was $680. The percentage increase for specific expenditures have been great, especially for police and fire protection. The percentage increase in debt obligations per capita have not been as dramatic. Still, it was found that Knoxville was above the average for 21 peer southeastern cities in expenditures per capita and debt obligation. On the revenue side, Knoxville was higher than the 21 city average for extracting revenues per capita, for taxing property, and for relying on intergovernmental aid. At the same time, the value of property taxed barely increased. In fact, the property tax base declined when values were converted to real terms. In order to sustain increasing expenditures, taxes had to be raised.

This section looks at the issues which were brought before the public by the city's mayor and council members as they considered the

city's budget and any tax increments needed to fund city operations and indebtedness.

Property Tax Levies

The city charter requires council to levy an annual tax on all taxable property, real, personal and mixed, not later than 15 days prior to the start of the fiscal year. The tax rate shall be sufficient, together with other anticipated revenues, fund balances, and reserves, to equal the amount of the appropriated budget and provide a reasonable amount of working capital for the city's funds.[6]

In the period under study the property tax rate has been increased on eight occasions and reduced twice. Table VI-1 shows

TABLE VI-1

TAX RATE INCREASES AND DECREASES: 1960-1982

Year	Amount Increase (Decrease) Per $100 Value
1961	$ .19
1963	- .25
1970	.05
1971	.10
1972	- .15
1973	.90
1976	.30
1977	.75
1980	1.30
1982	.64

[6]City of Knoxville Charter, Article IX, Sec. 901 (G).

the amount of increases and decreases from the previous rate per $100 value. The issues and justifications for these tax changes are described in the following section.

Fiscal Year 1961

The tax rate increase for 1961 over the previous year amounted to 7 percent; the general fund budget, however, increased 9 percent. Mayor John Duncan, who had to cast the deciding vote for the tax measure in order to break the council deadlock, attributed the increase to debt service expenses.[7] Indeed, debt service did increase 14 percent over the previous level. Debt service and general government operations consumed over $2.51, or nearly 81 percent, of the $3.10 tax rate. Principal and interest payments, constituting 40 percent of the total tax levy, was designated by the tax ordinance as receiving $1.2523 of the rate. Other city functions designated portions of the property tax were schools at $ .45, $ .02 for public library services, and $ .07 for probable failure in tax collections. Other general government operations were to receive $1.2636, or 41 percent, of the $3.10 tax rate.

The tax rate increase, according to Finance Director W. H. Peters, was $ .09 short of the amount needed to completely fund the city budget. Council members contended that the $ .09 was waved in the transfer of certain public health functions to the county government. An estimated $212,000 was saved in the general fund budget by

---

[7]"City Tax Rate Hiked 19 Cents: Mayor Breaks Tie," Knoxville News Sentinel, March 15, 1961, p. 1A.

the transfer of the City Health Bureau to the Knox County Welfare Department. The functions assumed by the county were Vital Statistics, nursing services, the mobile X-ray unit, and Well Baby Stations. Inspection services of the Health Bureau which involved meat, grocery, food and milk inspection remained under the city. These inspection services generated enough money from fees to be self-supporting.[8]

The $3.10 per $100 value property tax remained constant through the next fiscal year even though the 1962 operating budget increased by 6 percent, but the principal and interest paid by the city declined slightly. The value of taxed property increased about 1 percent in 1962 over the previous year thus generating approximately $84,000 in additional revenues.

In this year the city annexed 51.3 square miles and increased the city's population with 56,138 residents who lived in the Fountain City and western fringe of Knoxville. The value of the property tax base to be added from annexed areas was $122,638,932, thus increasing the total base by 52 percent. If the tax rate remained at the $3.10 level, the increase in property tax revenues would have amounted to $3,561,127, but the rate was decreased in 1963.

Fiscal Year 1963

In 1963 Mayor Duncan proposed a budget which included a tax decrease of $ .25. According to Finance Director W. H. Peters the

---

[8]"County Set to Operate City Bureau," Knoxville Journal, 28 February, 1961, sec. A, p. 1.

tax rate of $2.85 per $100 value would produce a surplus of $5,000, but he did say that the revenue estimates were on the conservative side.[9] The tax rate proposed was designated as follows: $1.1160, or 39 percent, to be set aside for principal and interest; $1.1140, or 39 percent, for general government functions; $ .45, or 39 percent, for school purposes; $ .1518, or 5 percent, for probable failure of tax collections; and $ .0347, or about 1 percent, for new school construction and equipment.[10]

The general fund budget which the $2.85 tax rate supported increased 33 percent over the previous year base, and the amount for debt service increased 14 percent. Included in the general fund budget were pay raises for city department chiefs, but rank and file employees did not receive pay increases. Councilman Ernest J. O'Connor had tried to get an 18 percent pay increase for all city employees during budget hearings, but his amendment was defeated. In the years to follow, employee pay increases were to become a major part of city budget hearings, tax increases, and sales tax referendums.

The property tax rate remained at the $2.85 level for the next seven years. The value of the assessed property increased by an average of $10,900,000 each year thus providing approximately $310,650 in additional property tax revenues each year. In addition, a

---

[9]"Council Approved $21,551,312 Outlay: Hikes Pay of Chiefs," Knoxville Journal, 27 February 1963, sec. A, p. 1.

[10]City of Knoxville, Ordinance 3276, March 12, 1963.

county-wide one cent sales tax was passed by a referendum in 1965. The local option sales tax proceeds were earmarked for school purposes, and it was divided by the city and county on the basis of average daily attendance in the two systems. The growth in the tax base, attributed to residential development in the recently annexed western area of the city, and the city's portion of the sales tax relieved Knoxville from property tax hikes during the period form 1963 to 1970.

The city budget, however, was growing at a rapid rate. In this seven year period the city debt service barely grew in annual obligations, but the operating budgets increased dramatically, especially in those functions such as police, fire, and garbage collection which had to increase manpower in order to provide services to the city expanded by the 1962 annexation. The budget for general government functions had increased 84 percent in 1969 from its 1963 level; police expenditures increased 79 percent; and by 1969, fire protection had increased over 102 percent. The number of city employees counted as full-time increased by 421, or 29 percent.

During this seven year period the city ended the fiscal year with deficits in 1965 and in 1969. The 1965 deficit amounted to $1,034,526 and was attributable to the failure of Knox County to divide payments-in-lieu of tax monies from Knoxville Utilities Board with the city. Knox County would not agree that the funds were subject to division, but eventually agreed to pay $500,000 to the city out of its 1966 budget. In addition, the County Tax Office, which combined city and

county property taxes on one billing statement, was late in sending out tax bills thus delaying collections and creating a $279,000 shortfall in anticipated revenues for Fiscal Year 1965.[11]

Fiscal Year 1968 would have ended with a deficit has not Mayor Leonard Rogers instituted "belt tightening" measures for city departments in order to cover anticipated alcoholic beverage inspection fees which did not materialize. City council had voted to double existing inspection fees in order to collect $500,000 to pay for salary increases for policemen and firemen. The Tennessee General Assembly, however, enacted legislation to freeze the legal limit for inspection fees at its current level. With the reduction in departmental spending below appropriated amounts, city uniformed employees were able to receive their salary increases and the city audit showed a surplus of $238,923 at the end of 1968.[12]

The growing general government budget, fueled by pressure for city employee salary increases, would define budget and taxing debate for the next ten years. Deficits would also be the reason for property tax increases in 1970, 1971, and 1972.

Fiscal Year 1970

In Fiscal Year 1970, Mayor Leonard Rogers had to propose a $ .05 tax increase in order to cover a year end general fund deficit of

---

[11]City of Knoxville, Annual Financial Reports, 1965, March 28, 1966, p. 4.

[12]City of Knoxville, Annual Financial Report, 1968, February 27, 1969, p. 1.

$241,992 for 1969. The City Charter requires that deficits be covered by additional tax revenues, thus the property tax was proposed to be increased to $2.90 per $100 value. The tax ordinance passed shows that $ .05, or 2 percent of the total rate, was designated for the deficit.[13]

By this time general government functions were allocated 63 percent of the tax rate--$1.841 out of $2.90. Bonded indebtedness received $ .863 of the tax rate, a 30 percent share. The public library system continued to receive $ .02 of the property tax rate, and the reserve for failure to collect anticipated taxes was designated as $ .122, representing 4 percent of the total tax rate.[14]

The budget, on final reading, and the proposed tax increase created a four-to-four split in the council vote, with one councilman absent from the meeting. Mayor Rogers had to cast the deciding vote for his budget and tax increase.[15] Nevertheless, Fiscal Year 1970 ended with both a general fund and a school board deficit of $844,000 which would have to be made up in additional tax revenues in 1971.

Fiscal Year 1971

In 1971 the city's general fund budget was increased by 21 percent over the 1970 base, but part of the increase included $3,803,278

---

[13]City of Knoxville, Ordinance 4948, March 3, 1970.

[14]Ibid.

[15]"Council Votes to Up Property Tax 5 Cents," Knoxville Journal, 18 February 1970, sec. A, p. 1.

designated for transfer to the education budget which was increased 12 percent over its 1970 level. As a result of state mandated reassessment, the value of assessed property in Knoxville increased 15 percent from 1970, but this addition to tax revenues would amount to only $1,919,550--short of budget increases. Promised salary raises amounting to $1,145,000 for teachers and uniformed employees were very much an issue in this budget, and the raises would ultimately be paid for by a half cent increase in the local option sales tax. The city tax rate, however, had to be increased by $ .10 to cover the proposed budget and the deficit.

Council passed the proposed budget only after it was announced by the mayor that it did not include pay raises but that a sales tax referendum would be submitted to city voters on May 5, 1971 to fund the increases. The mayor maintained that the property tax rate increase was needed to cover the deficit. Two alternative revenue measures were offered by council members. Both would keep the property tax rate at $2.90, but one measure called for a $2.50 per month garbage collection fee; the second proposal would increase the fee for a city motor vehicle sticker by $3.00. Both measures failed to pass.[16]

The tax ordinance for 1971 designated 61 percent, or $1.831, of the $3.00 tax rate to general government purposes. The sinking fund would take only 28 percent of the tax rate with $ .828 designated for

---

[16]"Roberts, Turner Join Bloc to Pass Mayor's Budget," Knoxville Journal, 17 February 1971, sec. A, p. 1.

principal and interest payments. The deficit balance for 1970 was to be covered by $ .165, or 5 percent of the tax rate. The reserve for probable failure of tax collections was designated 5 percent, or $ .156 of the rate, and the public library system continued to receive an earmarked $ .02 out of the tax, an amount which continued to decline as a percent of the total tax rate.[17]

Fiscal Year 1972

Assessed property values were higher in 1972 than for any other year covered by this study. State mandated reevaluation accounts for the increase. As a result, the newly elected mayor, Kyle Testerman, proposed a tax rate decrease of $ .15 with his 1972 budget which was also decreased 1 percent from the previous year. Tax revenues, which now included an additional half cent sales tax, were considered sufficient to cover the operating budget, debt service, and capital expenditures despite a property tax cut.

Part of the reduction in the 1972 budget is accounted for by the transfer of indigent hospital care to the Knox County Welfare Department. Hospital expenses for the needy had amounted to over $1 million every year since 1963, and the United Community Services agency had studied and recommended the transfer. The county, which had taken over other public health functions from the city in 1961, and had since passed these on the Tennessee Department of Public Health, did not oppose the assumption of indigent health care.

---

[17]City of Knoxville, Ordinance 5140, March 2, 1971.

The 1972 tax ordinance passed, however, still had to fund a deficit from the prior year close out. This amounted to $ .047, or 2 percent, of the $2.85 tax rate. General government purposes continued to take the largest portion of the tax rate at $1.759, or 62 percent of the total. Principal and interest expenses as a percent of the total property tax rate increased slightly from the previous year at $ .865 which is 30 percent of the total rate. The contingency for failure to collect taxes was earmarked at $ .159, and the library system continued to receive only $ .02 out of the tax rate.[18]

Fiscal Year 1973

The city's general fund budget proposed for 1973 increased 8 percent over the previous year's budget, and it had to be funded from a property tax base which decreased in value by 19 percent. The large decrease of $101,509,343 from the 1972 base resulted from reductions of reappraised values on appeals to the local Tax equalization Board and the new constitutional amendment providing for reclassification of taxable property. At the rate of $2.85 per $100 value, this would mean a loss of $2,893,016 in revenues.

Funding the general operations of the city, however, was compounded by a $1.85 tax rate ceiling on local government operations which had also gone into effect as a result of the state constitutional amendment on property tax classification passed by state voters in 1972. State legislative delegations from Tennessee' urban centers,

---

[18]City of Knoxville, Ordinance 5285, February 29, 1972.

however, were preparing to introduce legislation which would lift the ceiling. In the meantime, Mayor Testerman proposed a tax increase of $ .90 to bring the city's tax rate to $3.75 per $100 value.

The city uniformed employees were active in lobbying the local state legislators to work for lifting the tax ceiling because "city employees are victims" of the wage freeze ordered by the mayor until the tax limitation issue was resolved.[19] Although state legislators had said in local meeting that there was considerable opposition to lifting the tax rate limitation, when the budget bill, which carried a tax increase exceeding the limit, came before council for final approval there were no comments, discussion, or objection from the public.[20]

City Council did set five conditions for adopting the budget. The conditions dealt with quarterly review of the city's finances, an inventory and application approval process for federal and state grants, computerization of the city's accounting process, review of bids exceeding $10,000, and that the budget be brought back to Council for reduction if legislation voiding the tax limitation were unsuccessful.[21] On March 13, 1973 Council passed the property tax ordinance increasing the rate by $ .90 without any discussion from Council or any comments from the audience.

---

[19]"City Employees Want Tax Lid Up: Legislators Hear Plea for Pay Boost," Knoxville New Sentinel, 4 March 1973, sec. A, p. 1.

[20]"Zoning Delay Voted for West Hills; Council Adopts Budget, Subject to Tax Rate Hike," Knoxville News Sentinel, 28 February 1973, sec. A, p. 1.

[21]Ibid.

The adopted tax ordinance departed from previous ordinances by lumping the portions of the tax designated for general government purposes and principal and interest together, thus $3.524, or 94 percent, of the $3.75 went to government operations and debt. The contingency for failure in tax collections was designated as 6 percent of the rate, or $ .226.

The $3.75 property tax rate remained in effect until 1976. The value of the property tax base increased only 8 percent from 1973 to 1976, but when the value is adjusted for inflation there was a decline of 14 percent.

Fiscal Year 1976

Fiscal year 1975 ended with a deficit of $1.7 million, and the budget presented by the new mayor, Randy Tyree, increased expenditures by 8 percent over 1975 and required a tax increase of $ .30 to fund it. This budget would be a 27 percent increase over the 1973 budget which set a tax rate of $3.75. It has been noted heretofore that the value of the property tax base increased only 8 percent during this period. In constant terms, however, the base declined 14 percent.

City Council added $541,000 to the Mayor's budget despite his objections and warnings that the increase would need an additional $ .07 on the proposed tax rate of $4.05 or massive personnel layoff would occur. The money added by Council included $125,000 for increases in teachers salaries, $176,000 to help amortize the

$1.7 million deficit, $165,000 to pay for increased costs of hospitalization insurance, and $40,000 for traffic engineering improvements.[22]

Council, however, approved the $4.05 per $100 value rate. The ordinance designated $2.25, or 56 percent of the rate, for general government purposes. Bonded indebtedness received $1.27, or 31 percent of the rate. Probable failure in tax collections received $ .45 of the rate, and the city's portion of a lease on a new city-county government office building received $ .08.[23]

Though city teachers received pay raises in the budget appropriated, council resisted pressure from city employees who were demanding a salary increase. This issue would surface later in the year after the state raised its sales tax and the percent allowable for the local option tax. To fund a requested $100 per month across-the-board increase in city employee salaries, council proposed that a referendum date be set to increase the local option sales tax by $ .0075. Spokesmen for city employees, however, were not in favor of a sales tax increase, and the motion for a referendum was tabled.[24]

A pay raise for city employees came up again in October of 1976 when the city's auditors projected that there would be a $1.25 million surplus at the end of the fiscal year. Council rejected the $100

---

[22]"30-Cent City Tax Rate Hike Approved by Council," Knoxville News Sentinel, 25 February 1976, sec. A, p. 1.

[23]City of Knoxville, Ordinance 6011, March 9, 1976.

[24]"Council Delays Pay Raise Vote; Tables Proposed Sales Tax Hike," Knoxville News Sentinel, 22 September 1976, sec. A, p. 1.

across-the-board monthly increase, but it did approve amending the city's budget to provide for $50 a month pay raise for employees.[25]

Fiscal Year 1977-78

In January 1977 the city changed its fiscal year cycle in order to conform with that of the state thus it encompassed 18 months, running from January 1, 1977 to June 30, 1978. The 18 month budget, as originally proposed by the mayor, would spend $56,656,729, but council increased the budget by $4,785,146. The increase largely consisted of salary adjustments. A longevity pay plan, which annually awarded employees for length of service, was adopted and funded for policemen and firemen. An additional $1.25 million was appropriated for other city employee pay raises, including city teachers whose base pay would be raised by $300. Funds were also appropriated to hire eight new firemen and additional policemen.[26] In order to fund the budget the property tax was increased to an annual rate of $4.80 per $100 value. Because the fiscal year consisted of 18 months, the total property tax bill would be $7.20 per $100 value.

At the same time council voted to raise the property tax it also adopted an ordinance calling for a referendum on a $ .0075 local option sales tax increase. This measure carried a stipulation that

---

[25]"Council Rejects Compromise; OK's $50 Monthly Pay Hike for Employees," Knoxville News Sentinel, 20 October 1976, sec. A, p. 1.

[26]"City Tax Rate Up 75¢ Pending Referendum," Knoxville News Sentinel, 9 March 1977, sec. A, p. 1.

the property tax would be reset by council to the $4.05 rate if city voters approved the sales tax.[27]

The property tax ordinance designated that $2.99, or 62 percent, of the rate would be for general government purposes. Principal and interest payments would take $1.60 of the tax rate, or 33 percent. The lease agreement on the city-county office building would receive $ .21, or 4 percent, from the tax rate.[28]

The property tax rate remained at $4.80 per $100 value in 1978, but the tax ordinance establishing the rate redistributed the earmarked amounts. General government purposes received a larger share--81 percent of the rate, or $3.88. Debt service declined in 1978 to 16 percent of the rate at $ .78 out of $4.80. Three percent of the tax, $ .14, went for the lease on the city-county building.[29]

In 1978 the budget and tax hearings were marked by city employee discord with the mayor and council over pay enhancement. The City Employees' League attorney, who said he represented the "stepchildren" of the budget pleaded that council consider adoption and funding of a longevity pay plan for other city employees similar to the one passed in 1977 for city firemen and policemen, and that the employees also receive a 5 percent across-the-board pay raise.

---

[27]City of Knoxville, Ordinance 63313-77, March 8, 1977.

[28]City of Knoxville, Ordinance 6282-77, March 8, 1977.

[29]City of Knoxville, Ordinance 0-82-78, June 13, 1978.

Council agreed to consider longevity, pay raises, and increased hospitalization benefits on its August agenda.[30]

Council also passed a resolution supporting Knox County Court's call for a referendum on a proposed $ .0025 local option sales tax increase to provide $3.6 million for school improvements. By resolution, an agreement with the county government was verified whereby the revenues from the proposed sales tax increase would be divided between the city and county on the basis of average daily attendance in the school systems.[31]

The issue of city employee pay was on council's agenda again in August 1978 along with a proposal for increased pension benefits for uniformed employees. Because nonuniformed employees wanted the same pension benefits proposed for policemen and firemen, pressure on council resulted in a deadlock which the mayor refused to break. The proposal for a longevity pay plan for nonuniformed city workers, salary increases, and improved benefits were deferred until the mayor presented council with a projected budget surplus figure--the only possible source for funding.[32]

When expected surplus figures were released, the amount was $500,000. The pay plan and increases requested would total nearly

---

[30]"$46.6 Million City Budget Approved," Knoxville News Sentinel, 14 June 1978, sec. A, p. 1.

[31]City of Knoxville, Resolution R-96-78, June 13, 1978.

[32]"City Pension Plan Stalled," Knoxville Journal, 9 August 1978, sec. A, p. 1.

$3 million. In addition, Traffic Engineering, the Fire and Police Departments had asked for additional appropriations over 1978-79 budget allocations. The surplus, however, was used to clear up deficits totaling $300,000 in two special city funds.[33]

In 1979 the $4.80 tax rate remained in place, but employee salary increases, benefits, and a negotiating process for employees were items on council's agenda when the budget was approved and the property tax rate set. The approved budget contained a compromise across-the-board raise of $76 a month for uniformed employees rather than the seven percent salary raise proposed by the mayor. In addition, the salary raise was deferred until October rather than taking effect July 1st, thus reducing salary costs by $623,000. The budget also included $700,000 for general government employees.

Policemen and firemen had a list of demands which included changes in sick leave and vacation policies, upgrading of entry level salaries and the base pay of other job classifications for uniformed employees, family dental insurance, and establishment of a bargaining procedure. The latter demand did succeed in being adopted as an ordinance which established a negotiation procedures that could be interpreted as a form of collective bargaining. The ordinance, strongly opposed by the mayor, authorized a procedure that set a schedule for administration meetings with employee representatives,

---

[33]"City Surplus Not Enough," Knoxville Journal, 10 August 1978, sec. A, p. 1.

intervention of a mediator, and finally selection and appointment of an advisory panel as last resort.[34]

The tax ordinance passed by council redistributed the $4.80 per $100 value rate from last year's tax ordinance. Debt service remained almost the same as the prior year at 32 percent of the tax rate, or $1.52. General government operations received 63 percent of the tax, or $3.02, and the lease on the city-county building offices received $ .26.[35]

Fiscal Year 1980-81

The largest property tax increase was levied by council to fund the budget for 1980-81. Council approved a $1.30 increase in the property tax rate but provided for its rescission if voters approved a $ .0075 sales tax increase to be placed on the ballot in August. This was the same tactic used successfully by Knox County Court in 1965 to persuade voters to approve a one cent local option sales tax, but this was also the amount needed to fund $5 million of budget amendments approved by council. The budget add-ons included $2,388,500 for employee pay raises and increased insurance costs, $1,000,000 for the city school system which was anticipating a budget deficit of nearly $3 million at fiscal year end. The public library system, after closing down several branch libraries, received an additional $397,000. The

---

[34]"Tyree's $47.4 Million Budget Sails Through Council," Knoxville News Sentinel, 14 June 1979, sec. A, p. 1.

[35]City of Knoxville, Ordinance 0-99-79, June 13, 1979.

Knoxville-Knox County Community Action Committee and other social service agencies received $376,000 to make up for Federal cuts in Title XX funds. Another $512,000 was appropriated for the Metropolitan Planning Commission, the city tax office, city recreation services, and street lighting.

The additional funding by council brought cheers from the audience attending the hearings. Most visible were city firemen who were dressed in red T-shirts with a large white question mark and "Strike" printed on the front and back. In exchange for the additional appropriations and salary increases city employee groups, library supporters, and community service agencies pledged to actively campaign for the proposed sales tax increase.[36] The property tax ordinance passed by council distributed the $6.10 property tax rate with $4.28, or 70 percent, to general government operations; 25 percent, or $1.54, went for debt service; and the remaining $ .28 to city government office lease payments.

The $6.10 property tax rate was not rescinded in August 1980 because the sales tax increase measure failed to be approved by city voters. The rate continued through the next fiscal year. In 1982 the property tax rate was again increased.

Fiscal Year 1982-83

Threats of strike and outbreaks of the "blue flu" during the opening of the World's Fair set the stage for budget and tax hearings

---

[36]"Council Passes Budge With $1.30 Property Tax Hike," Knoxville News Sentinel, 11 June 1980, sec. A, p. 1.

in 1982, and resulted in council's rescinding nearly $2 million in budget cuts it had earlier approved and adopted a $ .64 increase in the property tax rate. The budget passed at 11:45 p.m., just minutes before the mayor's proposed $66.8 million budget would have been considered automatically approved, guaranteed funding the uniformed services career development program, the promised 9 percent employee pay raises, and provided almost $1 million additional funds for the city school system.[37]

The tax ordinance passed by council allocated $4.60, or 68 percent, of the $6.74 tax rate to general government operations. Debt service was designated 24 percent, or $1.62, out of the property tax rate. The city-county building lease would receive $ .28 of the $6.74, and the city's lease on the Knoxville Exhibition Center, built on the World's Fair site, was allocated $ .24 out of the tax rate.

Summary on Property Tax Levies

The property tax rate during the period under study went from $2.91 per $100 value in 1960 to $6.74 in 1982, an increase of 132 percent. The property tax base was valued at $231,072,143 in 1960; in 1982 the assessed value was $531,743,873. This represents an increase in the tax base of 103 percent. When nominal figures are adjusted for inflation, however, the values go from $336,349,553 in 1960 to $256,595,991 in 1982--a 24 percent decline. The tax rate when

---

[37]"Tyree Tax Hike OK'd on Steel Vote," Knoxville News Sentinel, 16 June 1982, sec. A, p. 1.

adjusted for inflation shows that the effective rate in 1960 was $4.24 per $100 value; in 1982 it was $3.25 per $100 value. Straight calculations of potential taxes on the inflation adjusted figures reveal that in 1982 property tax as a revenue source declined by 42 percent.

Knoxville, like other cities, had to keep up with inflation by enhancing revenues, using intergovernmental revenues when possible, and cutting or transferring services to other governmental levels. The only means for revenue enhancement council had under its control were the property tax and user charges. The other alternative was to submit to voters the option to raise the sales tax. This tax issue will be reviewed in the following section.

The Local Sales Tax

For local governments in Tennessee the second major source of locally derived revenues is the local-option sales tax. Legislation enabling local governments to utilize the sales tax was adopted by the General Assembly in 1963. The measure set a maximum of one-third of the state tax rate which could be used by local governments. In 1968 the law was changed to permit local governments to tax up to 50 percent of the state tax. Changes in the state and local sales tax rates are shown in Table VI-2.

The problem with implementing revenue increases with the local option sales tax is that it must be approved by referendum. This tax has not been popular as a source of revenue enhancement in Knox County or Knoxville. Table VI-3 shows the number of times the tax

TABLE VI-2

STATE SALES TAX RATE AND LOCAL OPTION LIMIT

Year	State Rate (%)	Maximum Local Rate (%)
1963	3.0	1.0
1968	3.0	2.5
1971	3.5	1.75
1976	4.5	2.25

Source: The Tennessee Advisory Commission on Intergovernmental Relations, Local Government Finance in Tennessee, December 1982, 97.

TABLE VI-3

RECORD OF LOCAL OPTION SALES TAX REFERENDA IN COUNTY AND CITY

Year	Jurisdiction	Tax Amount	Outcome
1965	Countywide	$ .0100	Passed
1969	Countywide	.0050	Defeated
1971	City	.0050	Passed
1977	City	.0075	Defeated
1978	Countywide	.0025	Defeated
1980	Countywide	.0075	Defeated
1980	City	.0075	Defeated
1981	City	.0075	Defeated

has been placed on the ballot and rejected by Knox County and city voters. The issues which surrounded the proposals for sales tax referendum in the county and city are discussed below.

Countywide Sales Tax Referenda

Though enabling legislation for the local option sales tax had been enacted for two years the Knox County government had not sought to increase its revenues by submitting the tax question to voters. By 1965 it became clear to both county and city officials, however, that they were faced with increasing government costs particularly for education. County and city officials both agreed to tap the sales tax earmarking the proceeds for education and dividing the revenues between the jurisdictions on the basis of average daily attendance in each school system.

The Knox County government planned to force the issue on voters by levying a $1.00 property tax increase which would be rolled back if the voters approved the sales tax measure. The Knox Court called for the referendum to be placed on the ballot on September 23, 1965. If the sales tax measure failed, the $1.00 property tax increase which affected both city and county property owners would be effective October 1, 1965.[38]

Knoxville City Council supported the County Court by passing a resolution urging the countywide referendum on the $ .01 sales tax.

---

[38]"Sales Tax Vote Sept. 23 OK'd," Knoxville News Sentinel, 9 August 1965, sec. A, p. 1.

The resolution stated that a sales tax would be "less burdensome to citizens than a $1.00 increase in the real estate tax."[39]

The sales tax passed with a margin of 880 votes which came from the city. Precincts in the suburban areas recently annexed by the city and city precincts which were predominantly Black were able to overcome county voters' opposition to the sales tax. The vote on the sales tax was as follows:

City Vote			County Vote		
For	Against	Margin	For	Against	Margin
18,628	15,694	+ 2,934	5,229	7,283	- 2,054

The sales tax had the backing of the community's educational, governmental, industrial, and labor leaders. Black leaders in the city strongly favored the sales tax as a means to raise educational standards in their neighborhoods.[40]

Educational needs also prompted the next two countywide local option sales tax measures in 1969 and 1978. These measures failed in both the city and county elections. The countywide sales tax referendum in 1980, which would have raised the tax by $ .0075, was not specifically presented as an educational need.

In the city the sales tax issue revolved around city employee pay and benefit increases. Perhaps the presence of a question on an

---

[39]City of Knoxville, Resolution 3304, August 9, 1965.

[40]"Annexed Areas Put Sales Tax In: 880 Is Margin, Rate Cut Coming," Knoxville New Sentinel, 24 September 1965, sec. A, p. 1.

annual automatic cost-of-living raise for city employees which had been placed on the same ballot for city voters helped to defeat the sales tax measure in the city. The votes for and against the sales tax were distributed as follows:

City Vote			County Vote		
For	Against	Margin	For	Against	Margin
11,375	15,725	- 4,350	7,162	15,766	- 8,604

The city voters also rejected by 16,244 to 10,294 the proposal for an automatic annual cost-of-living raise for city employees.[41]

The one successful attempt to utilize the local sales tax option in Knox County was designated for education. This is common in Tennessee. Most of the 94 counties that use the sales tax have allocated the proceeds for public education.[42]

Citywide Sales Tax Referenda

There have been four local option sales tax votes called for the city alone, and only one has resulted in a tax increase. The first and only successful measure was in 1971. The city property tax rate had been increased $ .10 in that year, and at the time the city budget and property tax measure were being considered, council also raised the

---

[41] "Voters Reject Sales Tax Rise and Living Cost Plan," Knoxville News Sentinel, 8 August 1980, sec. A, p. 1.

[42] The Tennessee Advisory Commission on Intergovernmental Relations, Local Government Finance in Tennessee (Nashville: December, 1982), 98.

issues of charging for residential garbage pickup and increase the cost of the city motor vehicle sticker by $3.00. The revenues were needed to meet pay raise demands of city teachers, policemen and firemen. Instead of these charges, however, council passed a resolution to place a one-half cent sales tax on a referendum ballot in May.[43]

The sales tax increase was passed by a 1,582 margin. City Finance Director James E. Newman said that the sales tax passage would enable teachers, policemen, and firemen to receive the promised pay increases in their June checks with the pay raise retroactive to January 1, 1971.[44]

City employee pay raises were also prominent in budget hearings in 1977. A longevity pay plan had been adopted and funded for city policemen and firemen along with pay raises for other city employees and teachers. The city property tax rate was increased $ .75 to help pay for the raises, but a resolution was also passed to submit to voters a $ .0075 sales tax increase which, if passed, would result in resetting the property tax at its previous rate of $4.05 per $100 value. The Knox County Court declined to join the city in extending the sales tax vote to the county areas.[45]

City voters rejected the $ .0075 sales tax by more than two-thirds margin. Out of 19,664 ballots cast, 13,433 were opposed to the

---

[43]City of Knoxville, Ordinance 5170, May 11, 1971.

[44]"Sales Tax Hike OK'd in Slim Vote; Pay Raises in City May Begin in June," Knoxville News Sentinel, 29 May 1971, sec. A, p. 1.

[45]"County Court Defers Action on City Sales Tax Referendum," Knoxville News Sentinel, 18 April 1977, sec. A, p. 1.

sales tax which had the backing of Mayor Tyree, the Knoxville Board of Education, and city employees who had received pay raises to be funded either from the sales tax or the recent property tax increase. The Knoxville Chamber of Commerce also supported the sales tax increase as a "lesser of two evils."[46]

The city's next attempt to raise revenues through the local sales tax option came on the heels of its countywide defeat on August 7, 1980. The sales tax issue in the city, as discussed heretofore, revolved around pay raises for city employees and its connection with a question on the ballot dealing with an annual automatic cost-of-living adjust for city employees. Its defeat, however, meant that the property tax for the city would remain at the $6.10 rate.

City voters, however, had the opportunity to vote again on the local option sales tax in September, but the margin for its defeat was greater. In this referendum 14,385 voters out of 24,353 were against the sales tax measure. As a result of its rejection for the second time, the $6.10 city property tax rate remained in effect. When the city rate is combined with the Knox County property tax, Knoxville property owners would be paying $10.11 per $100 value, the highest property tax in the state's metropolitan areas.

The mayor and other political leaders predicted that failure to raise the sales tax would result in greater efforts to consolidate the city and county school systems, would force the city to lobby the state

---

[46]"City Sales Tax Hike Downed by 2-1 Margin," Knoxville New Sentinel, 27 April 1977, sec. A, p. 1.

for other local option taxes, raise existing service charges and institute additional user charges, as well as cut back on current service levels.[47]

The local option sales tax was submitted to city voters again in November 1981. This time the tax increase of $ .0075 was to be a temporary tax running concurrent with the World's Fair. It would take effect on April 1, 1982 and expire on December 31, 1982. It was estimated that the tax would generate about $9.5 million.[48] The proposed temporary tax, however, was overwhelmingly defeated by 15,404 city voters; there were only 5,171 votes for the sales tax increase. The reaction of the city's mayor to the sales tax defeat was that he had fulfilled his commitment to city employees by putting the $ .0075 sales tax increase on the ballot. The additional tax revenue was to provide a 9 percent across-the-board pay raise for city employees, in addition to some capital improvements which were not specified. The pay raise agreement had resulted from 17 hours of negotiations between the mayor and representative for policemen and firemen.[49]

Sales tax increases which have been voted on by voters have always been associated with city employee pay increases--even the one

---

[47]"Tyree Predicts Tax Vote Will Bring Budget Crunch," Knoxville News Sentinel, 1 October 1980, sec. A, p. 1.

[48]"Sales Tax Referendum Set Nov. 19," Knoxville News Sentinel, 16 September 1981, sec. A, p. 1.

[49]"Added Sales Tax Smashed by 3 to 1," Knoxville News Sentinel, 20 November 1981, sec. A, p. 1.

successful sales tax option which increased the tax by one-half cent was for salary increases for city teachers, policemen, and firemen.

Summary on Local Option Sales Tax

The history of the local option sales tax in Knoxville and Knox County shows that this is an unpopular tax with voters, and one which elected officials cannot depend upon as a revenue source when making budget decisions. Even when city property taxes were increased, as in 1977 and 1980, with the stipulation that the increase would be rescinded if sales tax measures were passed, voters have rejected the sales tax. Whether voters would have approved sales tax increases if the purposes had been targeted for expenses other than salaries cannot be determined. The initial sales tax measure in 1965 was specifically for educational purposes and it was passed by voters, but two sales tax increases proposed in 1969 and 1978 were also for school purposes, and these two measures failed at the polls.

Summary on Taxing Decisions

Each year elected officials in a city determine what will be spent to carry out the city functions and to meet the annual payments due on its long-term debt. These expenditures need to be covered by sufficient revenues. The property tax is one of the major sources of revenue for local governments. Approximately 50 percent of Knoxville's total general fund revenues come from property taxes. Property tax rate setting occurs each year after a budget has been

approved by the city's legislative body. Knoxville's city charter requires that the annual property tax levy be set 15 days preceding the ensuing fiscal year.[50] The property tax is the residual of approved expenditures less nonproperty tax revenues divided by the assessed value of property. This is a mathematical formula, however, and it has little to do with the decision process which has preceded it. The budget and consequently the taxes to be raised are greatly influenced by the environment of the city in which it is formulated. Parts of that environment are the economic and social factors associated with urban decline and fiscal stress.

When budget promises are made that exceed the ability of city officials to effectively raise property tax revenues, the only other large source of tax revenues available for local governments in Tennessee is the local option sales tax. This tax, however, must be approved by voters. Then budget outcomes are questions for voters to resolve. Are the expenditures worth the additional costs to voters? On three occasions, Knoxville voters have had the option of increased property taxes or more sales tax, and the higher sales tax was substituted for the higher property tax rate in only one instance. Thus voters seem to leave to city council the hard decisions of approving an expenditure level and raising the revenues to fund it.

The decisions, however, are the product of the political process. Who will get the available resources and how much are part of that process? How much of the available resources will go for police and

---

[50]City of Knoxville, Article IX, sec. 901 (G).

fire protection, how much for other governmental functions, and how much will be invested in the city's infrastructure are the questions resolved at the time the budget is approved and the property tax rate established.

Knoxville's long-term debt used for the building and maintenance of the public infrastructure and secured primarily by the city's taxing authority has not consumed a large portion of the annual tax levy. General government functions, the labor intensive provision of services for the health, safety, and general welfare of the city's residents, have taken the largest share of property tax levies reviewed in this study. In addition, public discussions which have accompanied city council's review and approval of the budget and setting of tax rates have centered around service provisions and city employee salary increases. Capital projects, including street, road, and bridge maintenance, have never surfaced as priority needs during budget and taxing discussions.

When city council has found it cannot or will not fund certain budget demands by property tax rate increases, it has shifted the funding question to voters. Educational needs and city employee pay increases have been two reasons for local option sales tax referenda in Knoxville. Only in the 1981 referendum were additional funds for unspecified capital projects advanced as a beneficiary of a sales tax increase.

Since long-term debt for capital improvements have not been major issues in tax increases, what has been the city's record in capital improvements? This question will be explored in the following section.

Decisions on Capital Spending

New construction and major maintenance and rehabilitation of existing public infrastructure are financed primarily through long-term debt. Debt obligation for capital spending in Knoxville has followed a pattern which has emerged nation-wide over the past 20 years. In 1960 "full faith and credit" debt--that debt which has unlimited claim on taxes and other revenues of the issuing jurisdiction--constituted 71 percent of the total debt of local government. In 1981 the percent of full faith and credit obligations shrank to 52 percent of total local debt.[51] In Knoxville, debt obligations to be paid exclusively from tax levies amounted to 95 percent of the city's total debt in 1960. In 1980 the percent of debt paid by tax levies amounted to 41 percent of the total debt obligation of Knoxville city government.

There is a caveat. A large portion of the debt excluded from the full faith and credit figures in city financial statements are issues secured first by revenues but guaranteed by ad valorem tax pledges. This is true of sewer system, airport, and auditorium bonds. Table VI-4 shows the amounts of debt obligation in the general fund and the amounts in funds considered to be enterprise or revenue funds but guaranteed by the city's taxing authority in 1960 and 1980.

---

[51] John L. Mikesell, Fiscal Administration: Analysis and Application for the Public Sector, 2nd ed. (Chicago: The Dorsey Press, 1986), 440.

TABLE VI-4

LONG-TERM DEBT OBLIGATIONS: 1960 AND 1980

Year	Total Obligations	Debt Paid from Property Tax
1960	$ 31,966,000	$30,291,000[1]
1980	215,012,838	87,732,025[2]

[1]Excludes bonds paid from State Street Aid Fund, Airport Fund, and Sewer Fund.

[2]Excludes bonds paid from Auditorium Fund, Airport Fund, and Sewer Fund.

Source: City of Knoxville, Annual Financial Reports for 1960 and 1980.

For the purposes of tax rate setting and financial statements revenue generating debt is excluded from the general fund. In the review of capital expenditures which follows, improvements financed by revenue but with general obligation guaranteed are included, as well as general fund obligation projects and projects financed by intergovernmental aid. The purpose for including these expenditures is to see if the changing nature of long-term debt for capital improvements and intergovernmental aid have influenced the outcome of investment or disinvestment in certain elements of the city infrastructure.

Capital Spending in Mayoral Administrations

In Tennessee there are no constitutional or statutory referendum requirements for local government issuance of general obligation long-

term debt bonds. This means that local elected officials have no limitations, other than their own good sense and what bond market ratings will allow as unspeculative investment, on the amount of debt the city can issue. This accrues to the advantage of elected officials who desire to undertake capital projects, and primarily, this is the mayor.

Based on their research on mayoral influence on city budgets, Salanick and Pfeffer found that mayors have more discretion or influence on a city's capital budget than on the general governmental functions budget. From the previous review of issues which came before Knoxville's City Council during budget hearings, it is notable that capital improvements were not among the issues discussed and debated. This lends support to the Salanick and Pfeffer conclusion that mayors control the agenda on the capital budget. For this reason the capital expenditures made during the period under study are grouped in years that encompass terms of the four mayors who held office. Those mayors were John J. Duncan (1959-64), Leonard R. Rogers (1965-71), Kyle C. Testerman (1972-75), and Randall Tyree (1976-1983). Illustration of the expenditures, however, are grouped by general project type, thus discussion of capital spending which follows will be under these categories.

Public Facilities

Capital investment included under public facilities are buildings intended for public use, convenience, and safety. This group includes the civic auditorium-coliseum, police and fire stations, school

and library buildings, recreation facilities, and parking facilities. Figure VI-1 shows the total amounts spent for public facilities from 1960 to 1982, grouped in years which correspond to mayoral administrations. Total amounts include funds derived from local bond issues as well as intergovernmental aid. The part that is exclusively local is represented by a broken line so that the gap between local and total is representative of the portion paid by intergovernmental aid.

The rise and fall of expenditures for public facilities is notable. Construction of public facilities increased after the 1962 annexation of extensive suburban areas around Knoxville, and it peaked in the administration of Leonard Rogers. Expenditures up to that point were exclusively financed by local funds. Intergovernmental aid, though slight, helped to finance some public facility investment in the administrations of Testerman and Tyree.

Parking facilities consumed the largest portion of all expenditures for public facilities. Almost 38 percent of total expenditures for public facilities has been for parking. Most of the parking structures built, in 1962 and from 1968 to 1973, are located adjacent to the city's civic auditorium-coliseum. The auditorium-coliseum is a $5.5 million facility completed in 1961. Construction expenditures for it are not reflected in public facility figures accumulated for this study since the obligation and encumbrance for construction would have occurred prior to 1960. The parking facilities, as well as the auditorium-coliseum complex, are on land acquired through the Morningside and Mountain View urban renewal projects, and, in addition to providing parking for

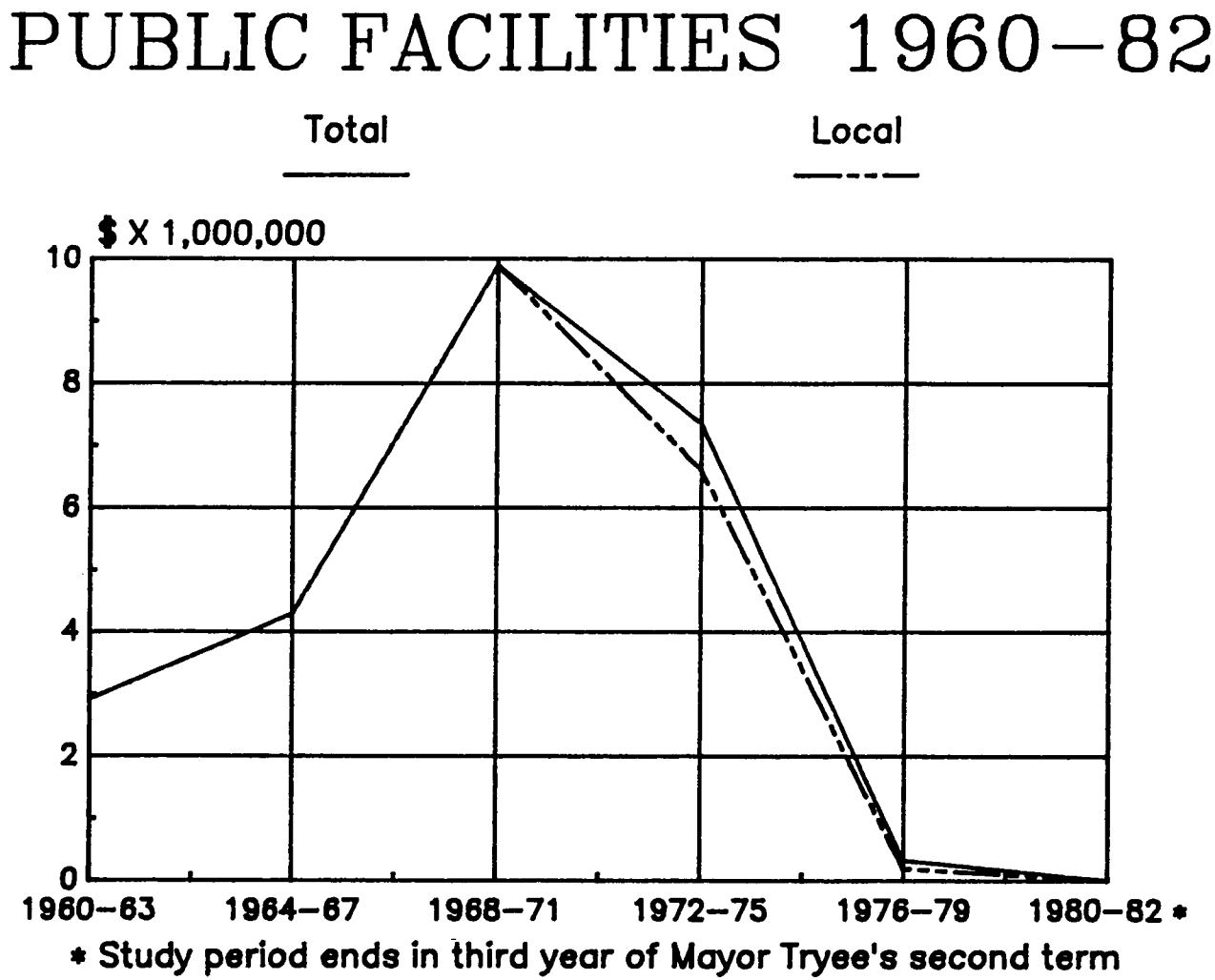


FIGURE VI-1. CAPITAL EXPENDITURES FOR PUBLIC FACILITIES DURING MAYORAL ADMINISTRATIONS.

the public attending events at the complex, the parking garages are within walking distance of downtown businesses and shops.

The city Safety Building, which houses the police department, city jail, and city court facilities, and fire stations account for the next largest expenditure of public facility money at 24 percent of the total. The construction of fire stations in newly acquired annexed areas are capital investments which would be expected for a city which had added approximately 51 square miles of suburban development to its territory. Fire station improvements occurred in the period from 1964 to 1967; police facility construction occurred from 1964 to 1967 and in the period from 1972 to 1975.

Libraries, school additions, recreation centers, and major maintenance of the civic auditorium-coliseum account for the remaining 40 percent of total money spent on public facilities. Twenty-two percent of the 40 percent was for recreation facilities--the only capital expenditure activity to use intergovernmental aid. Federal grants for recreation under the U.S. Department of Housing and Urban Development were used to construct several inner-city parks and a multipurpose school stadium during the Testerman and Tyree administrations.

Public facilities, however, are financed primarily through the issuance of bonds. The auditorium-coliseum and parking facilities are revenue generating enterprises, but the bonds are guaranteed by the city's taxing authority. Historically, revenues from these enterprises have not been sufficient to cover operational and maintenance costs in

addition to annual principal and interest payments on the bonds so the general fund has had to subsidize these operations by keeping up the debt service. The other public facilities are not revenue generating enterprises, and the costs of operation and maintenance are borne by the city government as well as the debt obligations.

Public Improvements

Expenditures grouped in this category are for street and road construction, rehabilitation, repavement, sidewalk reconstruction, storm drainage improvements, bridge repair, and land acquisition and engineering costs associated with the work. Figure VI-2 shows expenditures for public improvements during the study period. Like public facility investment, little intergovernmental aid has been received for public improvement projects. Financing these projects is dependent upon the city incurring long-term general obligation debt.

Expenditures for public improvements peaked in the first term of Mayor Tyree, and even though there was a decline in his second term, the expenditures were greater during the Tyree administrations than in previous mayoral administrations.

In the peak period, from 1976 to 1979, the reconstruction of Middlebrook Pike, a two-lane curving arterial roadway which was experiencing increased traffic from suburban development north of Interstate 40/75 and Kingston Pike and carrying truck traffic to and from the Middlebrook Pike Industrial Park, accounted for 35 percent of the money spent. First Creek Drainage improvements and traffic engineering improvements for computerized traffic lights, when combined,

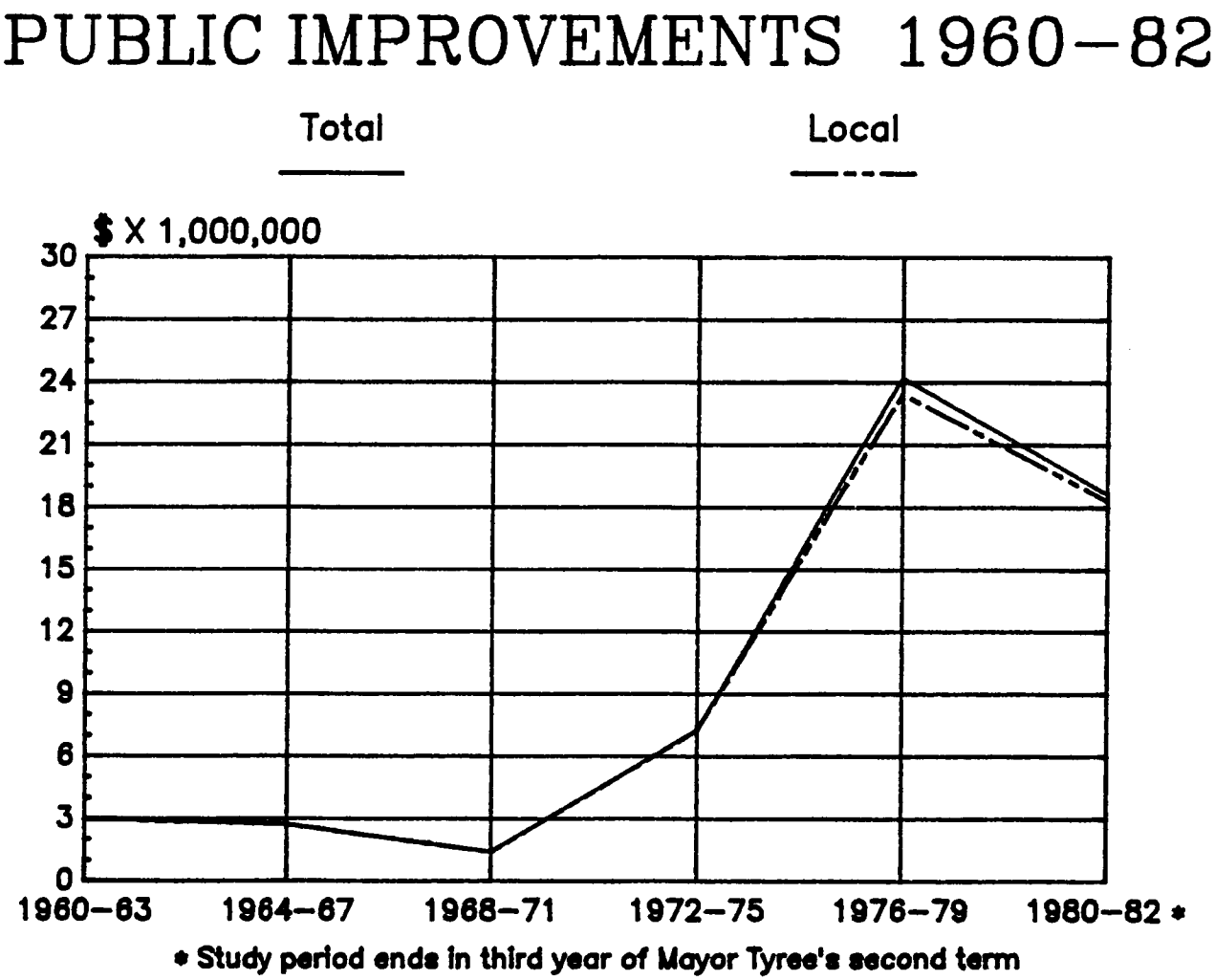


FIGURE VI-2. CAPITAL EXPENDITURES FOR PUBLIC IMPROVEMENTS, INCLUDING STREETS AND ROADS DURING MAYORAL ADMINISTRATIONS.

consumed another 20 percent of the capital expenditures during this period. The remaining expenditures were for resurfacing contracts, particularly for downtown streets. In the period from 1980 to 1982 downtown paving and resurfacing of streets in the vicinity of the 1982 World's Fair consumed most of the improvement expenditures.

The intergovernmental aid which is shown as the gap between total expenditures and local expenditures in Figure VI-2, is federal money from Economic Development Agency grants for sidewalk reconstruction around major downtown redevelopment projects. These included the Wall and Market Streets renovation, the Bijou Theater restoration project, and rehabilitation of the Traffic Engineering Shop on Elm Street.

Streets, roads, bridges, and sidewalks, of course, are non-revenue producing assets--at least in a direct sense--so all the indebtedness for public improvements in this category are financed by "full faith and credit" obligations of the city.

Urban and Economic Development

The costs for land acquisition and relocation of residents from the urban renewal areas of Morningside and Mountain View had been near completion prior to 1960. A combination of public and private money redeveloped the area from 1959 to 1975. The city constructed the civic auditorium-coliseum on urban renewal land, as well as parking facilities and the city's Safety Building. These public facilities were discussed in a previous section. Private developers constructed a hotel, bank, and an office complex on the Mountain View urban

renewal site. Subsidized single-family housing and apartments were constructed to the east and north of the government-commercial development.

As Figure VI-3 shows, from 1960 to 1971 few expenditures were made for urban renewal alone. Urban renewal and economic development activity was rejuvenated by Mayor Testerman who would have liked to "bulldoze downtown and start all over again."[52] Summit Hill redevelopment, which involved the acquisition of blighted business structures on Wall Street and delapidated housing on Walnut and Vine streets, was intended to make way for the construction of a major office complex to house the Tennessee Valley Authority, which had its offices scattered through the city. The Summit Hill project was part of a design for downtown redevelopment known as the North-South Market Street Mall. The plan would be anchored by the TVA towers on the north end and the city/county government office building on the south. In between would be pedestrian walkways and open space leading to retail and eating establishments on Market Square Mall. City investment in the Summit Hill redevelopment project amounted to $6,019,842 from 1975 to 1980. All of these funds were derived from local bond issues.

The most spectacular rise in urban economic development expenditures occurred for the 1982 World's Fair. Federal Urban Development

---

[52]Michael J. McDonald and William Bruce Wheeler, Knoxville, Tennessee: Continuity and Change in an Appalachian City (Knoxville: The University of Tennessee Press, 1983), 158.

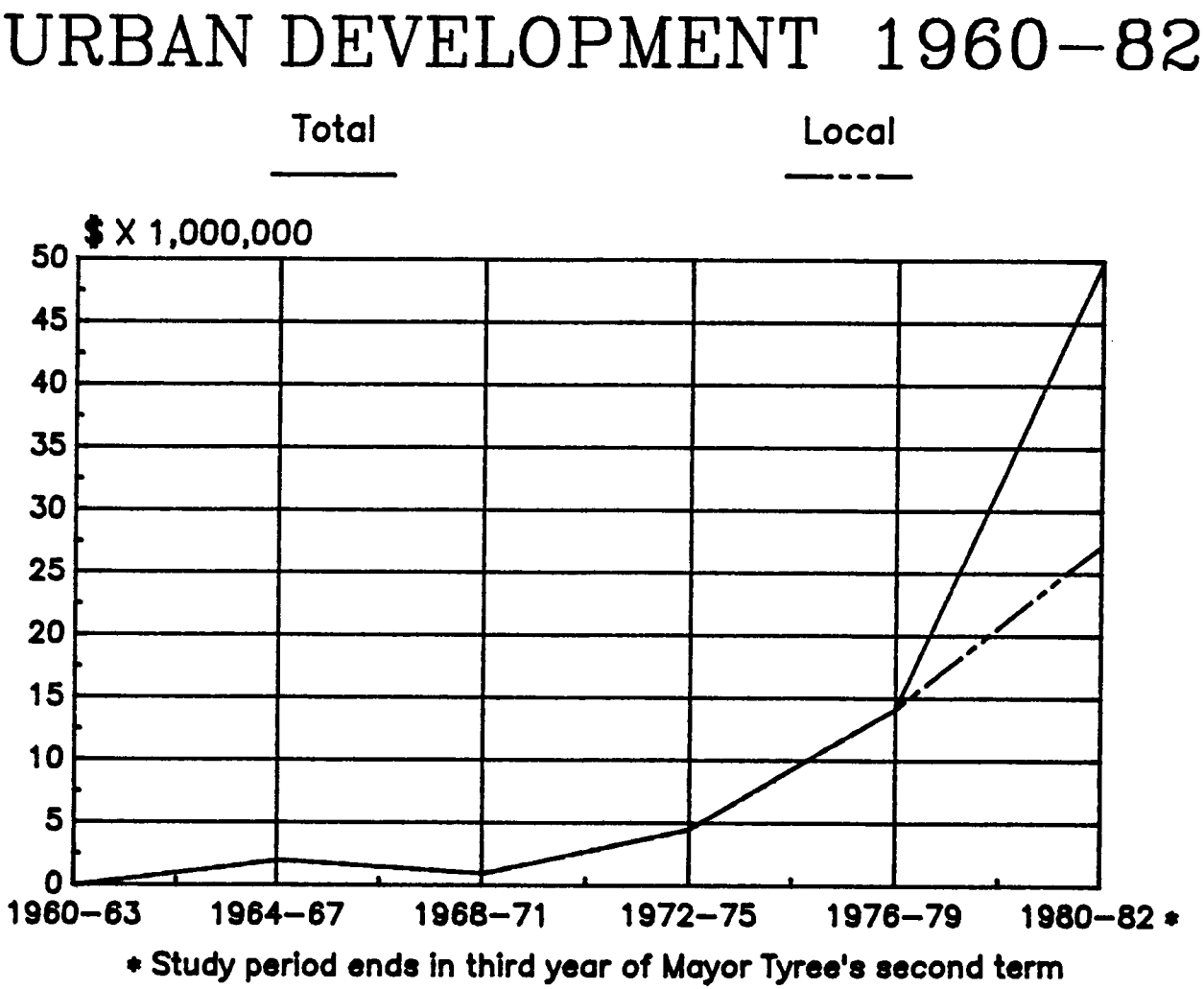


FIGURE VI-3. CAPITAL EXPENDITURES FOR URBAN RENEWAL AND ECONOMIC DEVELOPMENT DURING MAYORAL ADMINISTRATIONS.

Action Grant money enabled the city to acquire the land for the fair site, relocate businesses and residents, and leverage 15 million in private investment needed to stage a world's fair which had as its theme energy conservation and innovation. In Figure VI-3, the gap between the solid line for total expenditures and the broken line for local government contributions illustrates clearly the role of federal aid in the 1982 World's Fair effort which was designed to create jobs and increase retail sales on a temporary basis but with long-term redevelopment of the site for retail and commercial establishments interspersed with open space and new housing. Over 85 percent of the money spent for urban renewal and economic development from 1960 to 1982 was for the 1982 World's Fair.

Airport Improvements

Construction and improvement of airport facilities have been greatly aided by federal funds, but only since the 1970s. Knoxville city government footed the bill initially for airport improvements and construction as shown in Figure VI-4. Not only was the long-term debt a city obligation, but operation of the city's first airport, the Downtown Island Airport, was part of general city government functions in the Public Service Department. McGhee-Tyson Airport, constructed in 1964, was also operated out of the Public Service Department.

Airport improvement bonds issued in 1957, 1961 and 1963 were general obligation bonds used to improve the Downtown Island Airport.

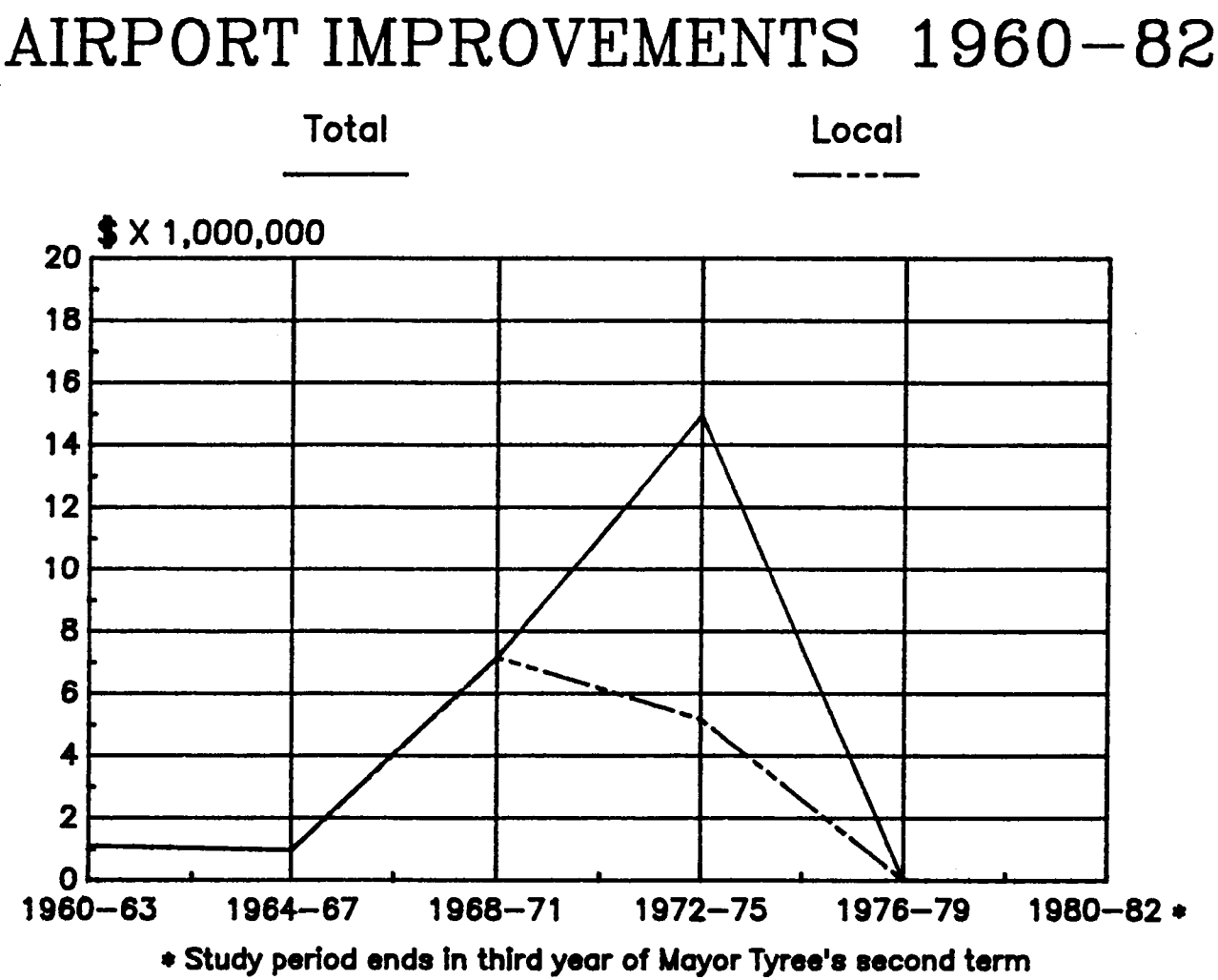


FIGURE VI-4. CAPITAL EXPENDITURES FOR AIRPORT IMPROVEMENTS DURING MAYORAL ADMINISTRATIONS.

Bonds issued in 1969 for construction of an Air Cargo Building, to be built at the McGhee-Tyson Airport, were also general obligation bonds, but were later converted to revenue/general obligation bonds with lease revenues securing the bonds. When construction of a larger airport terminal to replace the old McGhee-Tyson facility was started in 1972, the financing was through airport revenue/general obligation bonds. These were issued in 1972, 1974 and 1976. Federal aid, made possible through a trust fund financed by fees imposed on domestic airline tickets, jet fuel, and aviation gasoline,[53] provided 64 percent of the capital costs for the new McGhee-Tyson Airport. Federal aid accounts for 40 percent of all airport capital investment illustrated in Figure VI-4 as the gap between the broken line and the solid line from 1968 to 1979.

In 1969 the Tennessee General Assembly authorized the creation of a Metropolitan Knoxville Airport Authority which would operate the Downtown Island and McGhee-Tyson Airports and assume the assets and debt obligations of the facilities.[54] It was not until 1978, however, that City Council consented to a lease agreement between the city and the Metropolitan Knoxville Airport Authority in which all assets and liabilities of the city connected with the airports were transferred to the Authority.[55] This lease agreement effectively

---

[53]J. Richard Aronson and John L. Hilley, Financing State and Local Governments, 4th ed. (Washington, D.C.: The Brookings Institution, 1986), 64-65.

[54]State of Tennessee, Public Acts, Chapter 174, 1969 Session.

[55]City of Knoxville, Resolutions R-59-78, R-63-78 and R-64-78.

removed from the city general debt obligation that portion of debt incurred for airport construction.

Sewer System Improvements

A comprehensive review of construction and improvements to the city's sewer system may be found in Chapter V so this summary of expenditures, illustrated by Figure VI-5, will emphasize the nature of the financing of sewer system improvements and the influence of federal policy.

In the 1960s sewer system improvements were in response to growing needs. The 1962 annexation added 51 square miles to the city and 56,138 more people to the population. To finance improvements to existing treatment facilities and extension of sewer lines in annexed areas the city issued general obligation bonds totaling $7,500,000 in 1963 and 1964. From 1964 to 1969 an additional $32,400,000 in bonds were issued for treatment plant construction, line extensions, and the acquisition of the Fountain City Utility District sewerage operation. These latter bonds were issued as Sewer Revenue/General Obligation debt with first liens on gross sewer system revenues.

Even though federal programs to control water pollution were first initiated in 1956 with the Water Pollution Control Act, it was not until the mid-1970s that the federal government enforced water purity standards issued by the Environmental Protection Agency. Knoxville's severe violation of EPA discharge standards at its Third Creek Plant, a secondary plant no longer able to handle and effectively treat wastewater coming into it, placed the city high on the eligibility list for

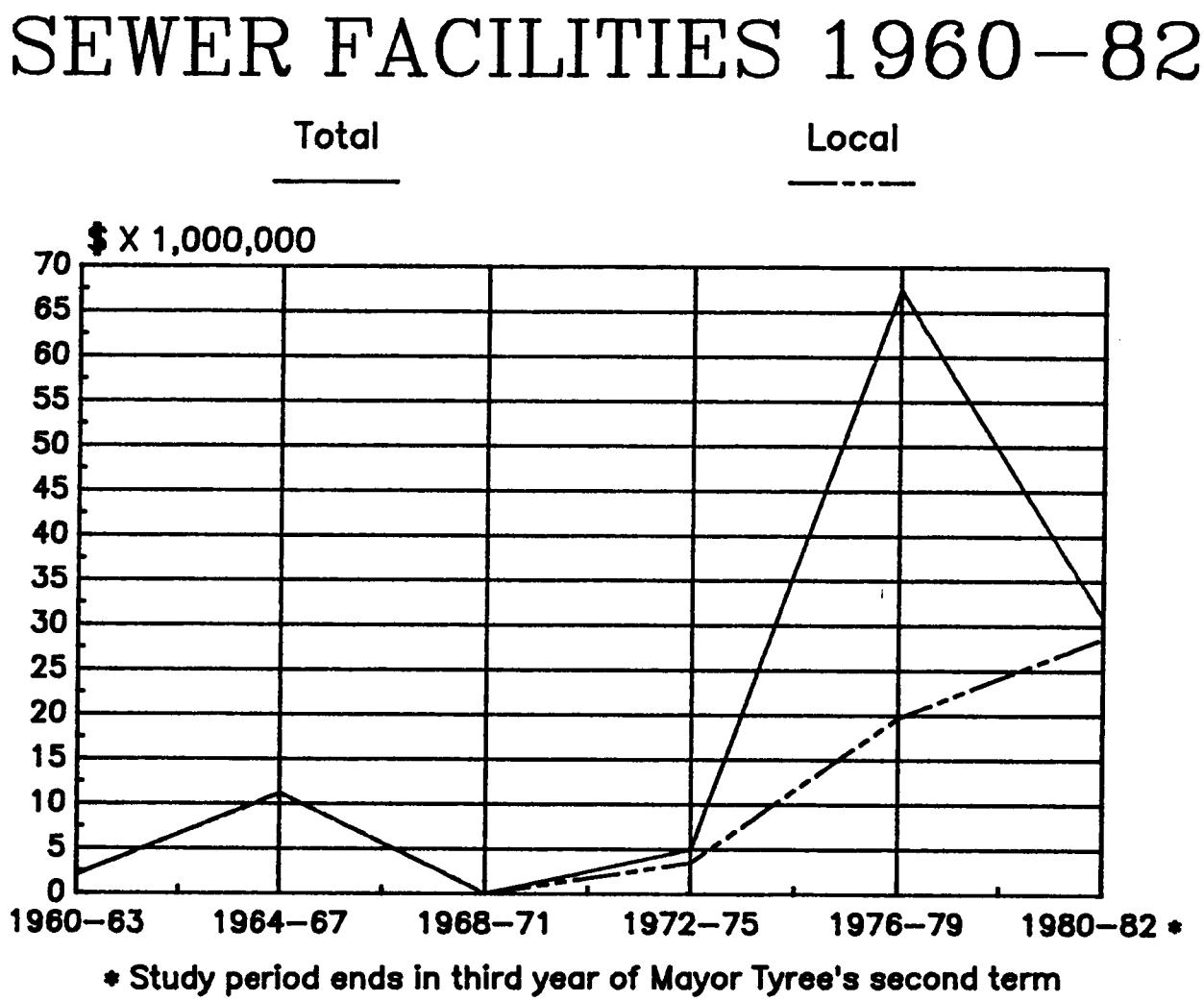


FIGURE VI-5. CAPITAL EXPENDITURES FOR SEWER SYSTEM IMPROVEMENTS DURING MAYORAL ADMINISTRATIONS.

federal grants for sewer rehabilitation and treatment plant construction. The grants contributed 75 percent of the eligible costs. In the ten year period from 1972 to 1982, federal money accounted for 50 percent of all money spent for sewer improvements. The largest capital outlay was for complete reconstruction of the Third Creek Treatment Plant facility.

Equipment Purchases

Several major equipment purchases for the Public Service Department have been made through the years from capital funds, and these need to be mentioned in the study. In addition, transportation equipment purchased with federal mass transit funds and local contributions have been included in this category. These expenditures are shown in Figure VI-6.

Garbage trucks, street sweepers, and street repair equipment consumed only $537,912 of total expenditures classified as equipment purchases. This in only 6 percent of the total, and all the funds are from general obligation issues. Federal aid for urban mass transit capital investment comprise 63 percent of all the equipment costs. The federal contributions totaled $6,018,269.

Summary on Capital Spending

Capital spending in Knoxville has moved from investing in capital improvements necessary for an expanding city to capital improvements to enhance downtown and economic development. The nature of the

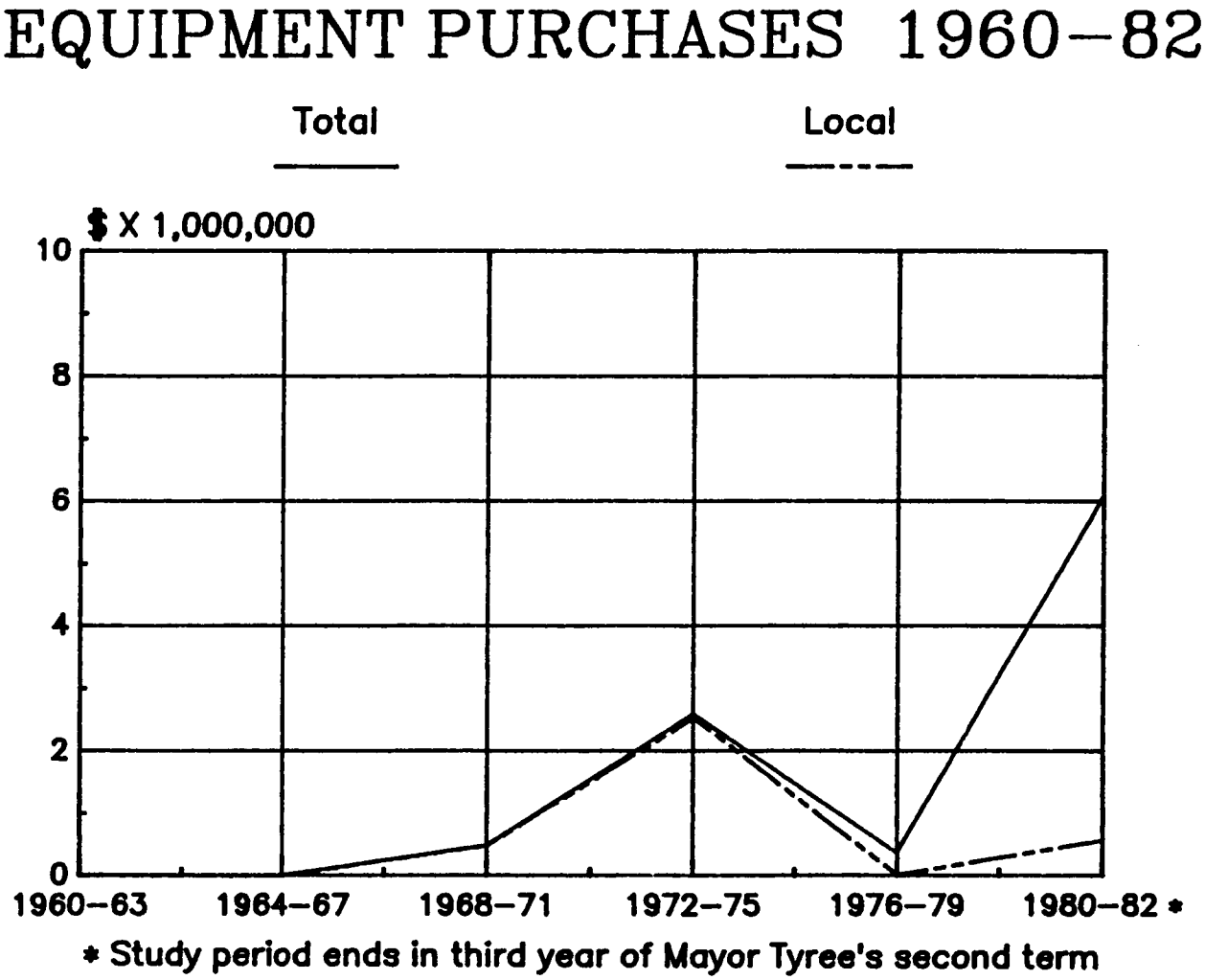


FIGURE VI-6. CAPITAL EXPENDITURES FOR EQUIPMENT, INCLUDING MASS TRANSIT, DURING MAYORAL ADMINISTRATIONS.

debt obligation to finance investment has influenced greatly the direction of capital spending. There has been a noticeable shift from general obligation indebtedness for infrastructure improvements to revenue supported indebtedness. In addition, federal aid since 1971 has influenced capital expenditures in pursuit of national policies as well as local needs.

Figure VI-7 shows total expenditures and the local portion of all capital expenditures from 1960 to 1982. Capital expenditures by project categories are recapitulated in Table VI-5. As a percent of total expenditures, sewer system improvements consumed the largest amount at 38 percent of all capital money spent. After sewer improvements and in descending order, category percentages of total expenditures were: urban renewal and economic development, 24 percent; public improvements, 19 percent; public facilities, 8 percent; airport facilities, 8 percent; and equipment, 3 percent.

For both sewer system improvements and urban renewal and economic development, which account for 62 percent of all capital expenditures, federal aid has been significant. In both categories local needs were served as well as the furtherance of national policies. Sewer system improvements were needed to accommodate sewer extensions to annexed territories, and the increased wastewater flows needed advanced treatment. Sewer system improvements to the Third Creek Treatment Plant that increased treatment levels and flow capacity enabled the city sewerage operation to comply with mandated EPA standards for discharge of its effluent into the public waterways.

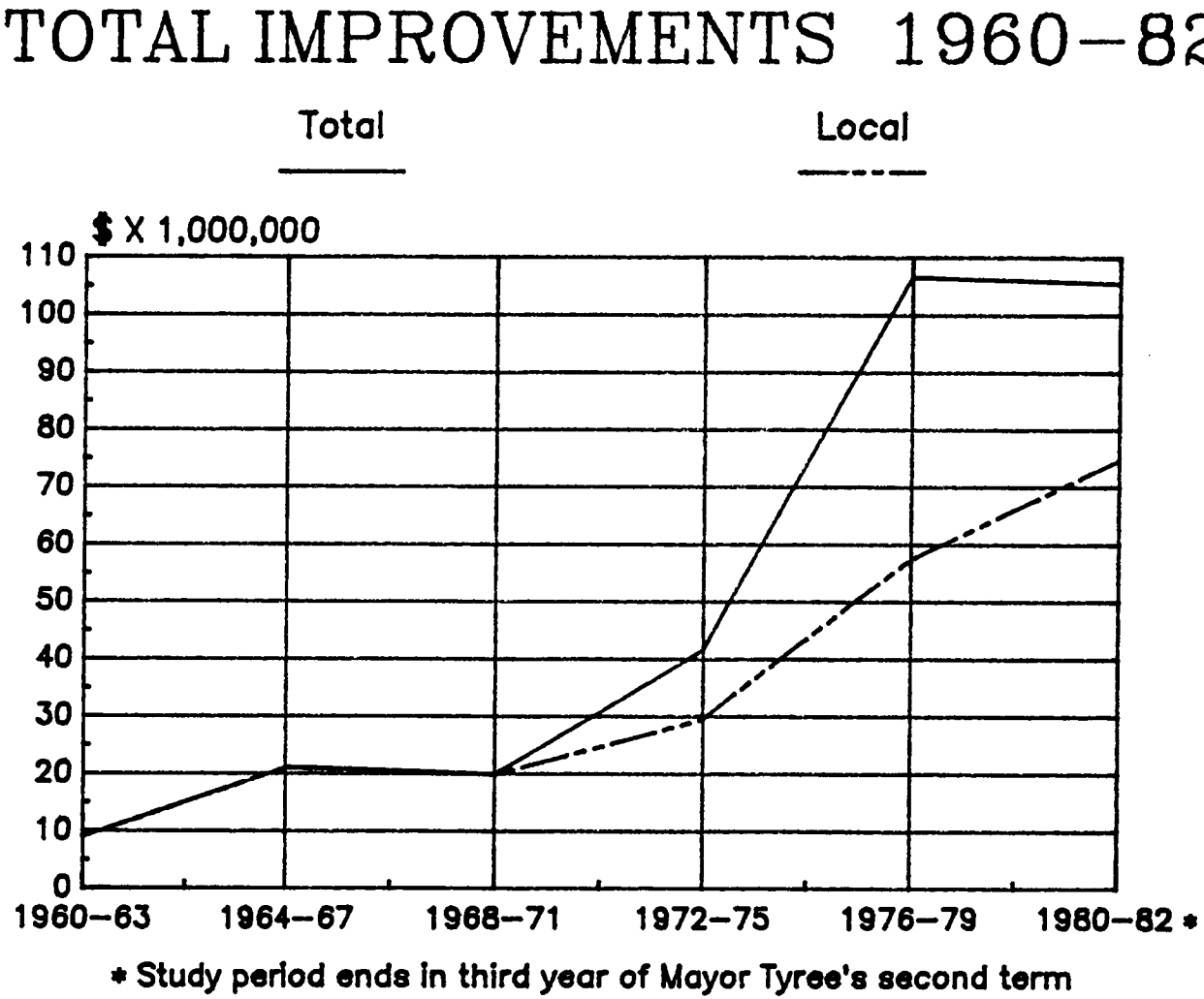


FIGURE VI-7. ALL CAPITAL EXPENDITURES DURING MAYORAL ADMINISTRATIONS.

TABLE VI-5

TOTAL OF CAPITAL EXPENDITURES BY CATEGORIES IN NOMINAL TERMS: 1960-1980

Project Categories	1960-63	1964-67	1968-71	1972-75	1976-79	1980-82
Facilities	$2,914,684	4,293,963	9,890,917	7,351,758	317,455	
Improvements	2,986,062	2,716,478	1,400,011	7,248,729	24,203,817	18,626,887
Development		1,973,620	903,687	4,479,196	14,125,323	49,776,568
Airport	1,086,563	944,486	7,153,060	14,935,530		
Sewer	2,048,002	11,169,683		4,921,064	67,490,658	30,934,445
Equipment			486,527	2,583,805	567,254	6,067,235
Totals	9,035,311	21,098,230	19,834,202	41,520,082	106,704,507	105,405,135

Source: City of Knoxville Financial Audits for years cited.

Economic development in Knoxville, principally the 1982 World's Fair, fulfilled local needs for development of a blighted area for temporary and long-term revenue and job opportunity enhancement. It also served to fulfill a national policy directed toward stemming the effects of urban decline.

The changing nature of bonded indebtedness, however, is also evident in the capital expenditures from 1960 to 1982. Expenditures financed by bonds that were backed by revenue pledges constitute about 70 percent of the capital projects. Improvements that are non-revenue generating, such as streets, roads, bridges, police and fire stations, and some recreational facilities, are financed by full faith and credit bonds and represent less than 30 percent of the expenditures.

The injection of federal funds in local capital projects and the changing nature of long-term debt from general obligation to revenue secured obligations occurred at about the same time period. In fact, federal aid in Knoxville has been directed toward revenue-generating enterprises--airport construction, sewer improvements, mass transit systems, and economic development. Federal aid served local needs and national policies simultaneously.

Economic decline and the need for industrial development were important to Mayors John Duncan and Leonard Rogers, as well as extending services to the areas annexed in 1962.[56] Economic rejuvenation through industrial development, however, was substituted by

---

[56]McDonald, 147-154.

business and financial development of downtown by Mayors Testerman and Tyree.[57]

Infrastructure disinvestment which has been documented in Knoxville's street system, particularly in residential and collector streets, has been the outcome of an emphasis on the part of city mayors for economic development of the downtown area, and the concomitant emphasis of debt issuance and federal aid in revenue-generating activities.

---

[57] Ibid., 154-163.

CHAPTER VII

CONCLUSIONS

The basic purpose of this study has been to identify and describe certain salient factors in the urban environment which lead to disinvestment in a city's infrastructure. Infrastructure disinvestment means the decline in city expenditures for acquisition of public physical assets and a decline in investment expenditures for maintenance and replacement of existing assets. Based upon a review of contemporary research pertaining to infrastructure condition in a number of large cities, disinvestment is uneven. There are cities that are engaging in massive infrastructure expansion and rehabilitation such as the cities of Dallas and Cincinnati. On the other hand, Cleveland faces a backlog of $700 million in basic improvements and New York City estimates needs of $12 billion for infrastructure rehabilitation.

If infrastructure investment or disinvestment varies from city to city, how can this be explained? This leads to questions about the factors in an urban environment which contribute to infrastructure decline. Some of the predominant reasons given for disinvestment are fiscal constraints imposed on local governments by voter resistance to higher taxes, declining intergovernmental aid, and declining own-source revenues. These reasons, however, give partial clues to understanding and explaining disinvestment. True, declining own-source revenues may require cutbacks in city expenditures, but not all functions, including infrastructure maintenance, are cut alike. Decisions are still made by elected officials to allocate city money among

competing demands. New acquisitions, maintenance, and rehabilitation of a city's infrastructure constitute one of the competing demands.

This study, which has focused on one city, began by asking two questions. Has infrastructure disinvestment occurred? If the city has disinvested in its capital assets, why? It may be said that this study is one of decision-making, but that is not entirely correct. Paul Peterson cautions those who study urban politics and decision-making that cities are limited in what they can do and what decisions can be made by local officials.[1] Environmental factors that derive from federal and state relations with cities, as well as public and private decisions that affect the social and economic conditions of a city, limit what a city can decide to do with its infrastructure. This study investigates that environment which impinges on decisions by city officials to invest or disinvest in urban infrastructures.

Previous studies indicate that infrastructure disinvestment is most likely to occur in a city suffering from financial strain, which refers to its inability to generate additional own-source revenues,[2] or from fiscal stress, which refers to an imbalance between a city's financial capacity and the demand of citizens for public goods and services.[3] Researchers, however, note that financial strain and fiscal stress may be symptoms of a problem in this nation's large cities--not the causes.

---

[1]Paul E. Peterson, City Limits (Chicago: University of Chicago Press, 1981), 4.

[2]Pagano, 147.

[3]Howell, 123.

Thus, one looks for other contributing factors in the urban environment to aid in understanding and explaining infrastructure disinvestment. Urban decline, a panoply of social and economic conditions that signal that a city at present is not better off than it once was, is the construct used to aid in this study of infrastructure disinvestment.

To generalize the possibility of explanation, the two concepts of urban decline and fiscal stress were incorporated into a model of urban infrastructure disinvestment. The model incorporates those elements of the urban environment which are important to the general problem of disinvestment. The variables, drawn from previous research on urban decline and fiscal stress, were defined in measurable terms called indicators. These indicators were then linked to propositions, based upon previous studies and derived from deduction, to predict decisions of city officials in making budget decisions regarding investment or disinvestment in the city's infrastructure. Since urban decline and fiscal stress do not occur in the course of only one or two years, but result from years of public and private decisions, the model requires longitudinal data. A 20 or 25 year time span may be required in order to reveal the historical trend of the relevant factors that can contribute to disinvestment decisions about a city's capital stock.

The posited disinvestment model is designed to allow for the analysis of the problem of infrastructure disinvestment in comparative perspective. The data used to assess the existence of urban decline and fiscal stress, as well as the condition of elements of the urban infrastructure are in general ubiquitous. In order to conduct a

comparative study involving a number of cities, the sample selected may be grouped on the basis of population, geographic region, similarity of the economic base, or age of the cities. The model introduced herein has been tested to a limited extent on one city, and the urban decline and fiscal stress components were used in a 21 city survey of southeastern cities, including Knoxville. Though limited, its empirical application provided a test for the data on infrastructure condition assessment and estimate of needs, and assessment of the value of aggregated revenue and expenditure data pertaining to cities.

Theory building about policy decisions by cities based on aggregate data have been termed as a "muddle" by Paul Peterson.[4] The use of aggregate data on city expenditures does assume sameness in responsibilities and functions which may be myth. In addition, taking debt obligation of cities at face value is subject to error especially when it is not clear if general obligation debt secured by property tax levies is included with revenue/general obligation debt, which is guaranteed by property levies if revenues are insufficient. Aided by certified public accounting firms, some cities have become more sophisticated in financial reporting, and these cities are able to present a better image to bond-buyers by separating these two categories of debt obligation. Relying on decennial data, researchers may not be aware if the distinction exists, or, if at a particular time period, the basis for reporting debt changed. In this study it was made clear

---

[4]Peterson, 9.

that general fund expenditures and revenues were used as the data base and when general obligation debt was separated from other debt.

While acknowledging the problems with aggregate data, their use still have validity in research. One of the purposes of research is to identify weaknesses in a research model and its elements, but at the same time it should adjust up the model for those who will follow. The research model in this study has been presented for the purposes of further testing, refinement or rejection.

Elements of the urban decline and fiscal stress components of the model were used in a survey of 20 southeastern cities and Knoxville in order to verify the finding that Knoxville does exhibit characteristics of a city suffering from urban decline and fiscal stress. Selection of a sample of peer cities was based on geographic region and population. The sample was confined to cities in the southeast because Knoxville is located in the region and it is part of the "Sunbelt"--a region of rapid growth in population and economic development. Growth, rather than urban decline, should be typical of cities in the Sunbelt region. Population in 1960 was also a basis of selection in order to track growth or decline in demographic indicators.

The Knoxville Study

When the longitudinal data which constitute the operationalized components of urban decline and fiscal stress are analyzed Knoxville exhibits more characteristics of urban decline than urban growth, and many of the characteristics associated with fiscal stress are evident in the city financial picture.

Knoxville, at the turn of the century and into the 1950s, was a center of industrial growth in the southeastern region. During the era which witnessed mass movement to the suburbs, Knoxville started losing its population and its industrial based economy. In 1962 Knoxville temporarily arrested the population decline when it annexed a large portion of contiguous territory. The Fountain City and west Knoxville annexation increased the city's territory by 51 square miles and its population by over 50,000 residents. Since 1962 Knoxville has not expanded its area, and the population is growing slower than the rate of growth in the surrounding county--to the point that by the 1984 Bureau of Census estimate, 53 percent of Knox County's population lived outside of Knoxville's city limits. Other demographic factors also indicate urban decline.

The population within the city's limits has grown steadily older, the minority population in the county is concentrated in the city, and there is a higher percent of families who live below the poverty level in Knoxville than in the unincorporated area of the county or the county as a whole. Though the housing in the city is not aged, with less than 50 percent having been built prior to 1940, the percent of housing which is renter-occupied has increased as more home-owners move to the outer suburbs or locate initially outside the city's limits.

Indicators of the economic environment also characterize Knoxville as a declining city. Once a manufacturing center in the southeastern region, Knoxville has become a service center in the eastern portion of the state. Manufacturing jobs have declined in the city, but they

have increased in the county. Retail and service sector jobs have increased in the city, as well as in the area outside the city's limits. Knoxville remains as a center for federal, state and local government employment. Though the unemployment rate has risen in the city, the ratio of employment to the population has increased, meaning that there are more job opportunities in the city. These jobs, however, are not necessarily filled by city residents since the city is the place of employment for people outside its boundaries as well as for people from surrounding counties. In 1960, 1970 and 1980 real per capita income was lower in Knoxville than in the county or the SMSA, and was less than the state figure in 1980. In 1980 the percent change in real per capita income for Knoxville was only 4.6 percent while the increase exceeded 25 percent in both the county and state. From an economic perspective Knoxville residents, during the period of study, do not appear to be as well off as those who reside outside the city limits.

The fiscal stress component of the infrastructure disinvestment model reviewed the city's debt, expenditures and revenues from 1960 to 1982. One of the important conclusions from the data is that Knoxville city government, like other local governments across the nation, has been hit hard by inflation. This has increased the cost of government at the same time that the demand for services from the public, particularly those services which are labor intensive, combined with salary demands from city employees have raised government expenditures. Increasing city expenditures have necessitated property

tax increases. The 21 city survey indicated that Knoxville was above the average for the sample of peer cities in per capita property tax revenues during the period under study. Chapter VI explored the budget and taxing decisions made by city officials from 1960 to 1982. In more cases than not, when a budget was passed that was not fundable by available revenues, the city property tax was increased.

Knoxville's property tax, allocated mainly for general government operations rather than debt service, has been imposed on a tax base that has increased a mere 4 percent, in real terms, over a 20 year period while the property tax rate has increased as twice that rate. The only significant increase in the property tax base occurred immediately after the 1962 annexation. Additional own-source revenues are limited, and city voters have consistently refused to increase the local option sales tax they pay. Thus Knoxville is a city in which there is an imbalance between financial capacity and the demands for public goods and services.

Intergovernmental aid has filled the gap between demand and resources. Specific state aid is for education and street maintenance. General state aid, or shared taxes, have increased as a percent of total general fund revenues, but Tennessee cities are below the national average in revenue from the state government. Federal general revenue sharing money has been a boon for Knoxville. Initially used by the city for small capital purchases and for new programs, during the Tyree administration general revenue sharing funds were used exclusively as a substitute for local funding to the city school

system. This is a clear instance of using federal funds to fill the local money gap. The Tennessee Advisory Commission on Intergovernmental Relations has noted that Tennessee cities are more heavily dependent on federal aid than the national average for cities. The 21 city survey made in this study confirmed that Knoxville is an "intergovernmental" city; one where revenue raising is substantially shared by multiple levels of government.[5] This is not a financially healthy situation for a city as federal aid is being reduced and federal revenue sharing money, in particular, is being abolished.

There is substantial evidence that Knoxville is a city suffering from urban decline and fiscal stress. Is its physical infrastructure also in a deteriorated condition? It depends upon the type of infrastructure. Pagano has already noted that there is a difference between infrastructure condition depending upon the source of funding.[6] Infrastructure which is supported by a system of user charges, such as sewer and water systems, are less likely to suffer from disinvestment. In this study two infrastructure systems were assessed for condition. One system, city sewers, was built with revenue/general obligation bonds and supported by user charges. The other system, streets and local bridges, was built with funds from general obligation bonds and maintained by state street aid money and local debt.

---

[5]Burchell, New Reality of Municipal Finance, 1.

[6]Pagano, 160.

The city sewer system has grown in both miles of collection lines and treatment capacity since 1960. Indirect measure of sewerline condition, such as breaks and backups, indicate that the system is in good shape. Of all capital expenditures made during the period under study, the sewer system consumed the largest share of money at 38 percent of the total. At the beginning of the 1980s the city sewer system had completed reconstruction of its Third Creek Treatment Plant at a cost of $69,000,000. Seventy-five percent of the eligible costs for reconstruction came from a federal EPA grant. So at the end of this study period there was not a significant backlog of maintenance or replacement needs for the city sewer system.

On the other hand, in 1980, if the city were to restore all city streets to a rating of "good," it would take $10.5 million. The largest share of the estimated costs, $8.5 million, would be for residential streets, but $2 million would be needed for collector streets. By 1980 a noticeable sign of disinvestment in city streets was the slippage of a small percent of arterial streets from a good rating to fair. There was more slippage of collector streets from good to fair, and residential streets were slipping into a poor rating. In this study, streets and roads have been assessed by structural criteria, but functional obsolence of streets might be a useful measure of infrastructure disinvestment. Functional obsolence would be a standard for determining if the width and alignment of streets are adequate for the traffic carried. Omission of the functional aspect of streets and roads from consideration may have the effect of greatly understating disinvestment in this category of physical assets.

By 1980 bridges which are maintained or replaced by the city were showing greater signs of deficiency. In 1980 bridges which were structurally deficient constituted 4 percent of all the city bridges, but 52 percent of the city bridges were functionally deficient. City streets, roads, and bridges received less than 20 percent of all capital expenditures made from 1960 to 1982.

Further Remarks on the Research

In order to improve the model of infrastructure disinvestment several remarks need to be made. This study and the model have used a number of indicators as a means to quantify changes in the environment in which infrastructure investment or disinvestment decisions are made. The indicators are tools; they supply the information, on a longitudinal basis, to describe the environments or components of the model. There is uncertainty, however, about the correlative significance of socioeconomic indicators with fiscal stress. Terry Nichols Clark is one who questions this linkage.[7]

For this reason the indicators need to be subjected to further tests with respect to their linkage to the fiscal stress and urban decline components of the model. In addition, standardized quantification of the dependent variable, i.e., infrastructure disinvestment, would aid in the application of this model to a survey of cities.

---

[7]Terry Nichols Clark and Lorna Crowley Ferguson, City Money: Political Processes, Fiscal Strain, and Retrenchment (New York: Columbia University Press, 1983), 77.

Another problem is the "free rider" effect which is alluded to in the study but not formally integrated into the model. Free riders are those individuals or business concerns which reside or are located in areas peripheral to the city limits who nonetheless derive considerable benefit from the city expenditures for roads, airports, and other public facilities. This is not to say, however, that these individuals which reside outside the city and use city public infrastructure do not contribute to the municipal tax base through their payment of local sales tax or user charges, but the contribution versus benefits are not accounted for.

A third problem is that all budget decisions are not included in this study. Through there has been some discussion of services which have been cut or transferred to other levels of government, there has not been an effort to determine if, by decision, city officials adapted to changes in city conditions, especially those that characterize urban decline. The decision component of the model has been limited to prominent issues at the time budgets were adopted and tax rates were set, and the decisions surrounding those issues.

Though issues surrounding local option sales tax referenda were discussed, decisions made by the state concerning state shared taxes were not included. All of these shortcomings are mentioned for the purpose of recognizing that the model is limited and has not taken into account all factors that impinge on or limit decisions. Its purpose was to aid research by abstracting the universe to some manageable factors that would help in describing and explaining infrastructure disinvestment.

This study yields several questions for later research. The "free rider" effect is one, particularly with reference to infrastructure systems which are not exclusive to city residents such as streets, roads, bridges, and airport facilities, to mention a few.

Another series of interrelated problems and questions concern the decisions on ways to increase city property tax revenues and the effect of these decisions on various systems of infrastructure. Clark and Ferguson have listed three local public decisions that can increase property tax revenues: the addition of new taxable property (annexation and previous tax-exempt property); increase in property assessment; and increase in the property tax rate. There is another set of decisions that officials can make which may benefit the city's economic and revenue base, and those have to do with decisions on downtown redevelopment. Certainly these types of decisions are made with the purpose of arresting decline. But how are infrastructure systems affected by the selection of any of these options? The Knoxville study has revealed some clues to this question.

The 1962 annexation increased significantly the city's property tax base. Downtown redevelopment, emphasized in the Testerman and Tyree administrations, has not had the same effect. There is not a noticeable increase in the property tax base as a result of various downtown redevelopment projects. Perhaps the effect has been one of sustaining rather than increasing the tax base. This has not been addressed in this research, but it is a topic which has merit particularly with respect to city expenditure demands and effects on the

infrastructure. Both annexation and downtown redevelopment increase demands on city budgetary resources. Is there a greater pay off in one option over the other?

Annexation had an impact on the two infrastructure systems assessed in this study. When the city limits were expanded the sewer system expanded also, and it captured more rate payers. An expanded service area helped the sewer system. Annexation doubled the city's street mileage, and most of the streets added were residential streets. But 20 years after annexation city streets, particularly residential streets, have slipped into poor condition. On the other hand, downtown streets and those around major redevelopment projects have been reconditioned or paved on a regular basis.

Another set of questions that are raised by this research deal with federal aid and infrastructure. It is clear that capital expenditure made by the city with federal aid were revenue generating enterprises, specifically the sewer system and airport facilities. At the same time, there has been a noticeable shift nationwide of local debt from full faith and credit to revenue guaranteed indebtedness. Is there a relationship between these two phenomenon, and do they have an effect on infrastructure maintenance and rehabilitation?

These problems and questions are mentioned to demonstrate that infrastructure disinvestment is too complicated to be explained fully in all facets by the model offered in this study. It is a subject, however, which is rich in potential for research concerning the economic and political determinants of infrastructure disinvestment.

BIBLIOGRAPHY

BIBLIOGRAPHY

A. BOOKS

Aiken, Michael, and Paul E. Mott, eds. The Structure of Community Power. New York: Random House, 1970.

Bahl, Roy, ed. The Fiscal Outlook for Cities: Implications of a National Urban Policy. Syracuse, N.Y.: Syracuse University Press, 1978.

Banfield, Edward C., ed. Urban Government: A Reader in Administration and Politics. New York: The Free Press, 1969.

Bollens, Edward C., ed. Special District Governments in the United States. Berkeley: University of California Press, 1957.

Birch, David L. The Economic Future of City and Suburb. New York: Committee for Economic Development, 1970.

Bradbury, Katherine L., Anthony Downs, and Kenneth A. Small. Urban Decline and the Future of American Cities. Washington, D.C.: The Brookings Institution, 1982.

Burchell, Robert W., and David Listokin, eds. Cities Under Stress: The Fiscal Crisis of Urban America. Piscataway, N.J.: The Center for Urban Policy Research, Rutgers, The State University of New Jersey, 1981.

Burchell, Robert W., James H. Carr, Richard L. Florida, and James Nemeth. The New Reality of Municipal Finance: The Rise and Fall of the Intergovernmental City. New Brunswick, N.J.: The Center for Urban Policy Research, Rutgers, The State University of New Jersey, 1984.

Campbell, Alan K., and Seymour Sacks. Metropolitan America: Fiscal Patterns and Governmental Systems. New York: The Free Press, 1967.

Caraley, Demetrios. Doing More with Less: Cutback Management in New York City. New York: The Graduate Program in Public Policy and Administration, Columbia University, 1982.

Chinitz, Benjamin. City and Suburbs. Pittsburgh: Pittsburgh Press, 1963.

Choate, Pat, and Susan Walter. America in Ruins: The Decaying Infrastructure. Durham, N.C.: Duke Press Paperbacks, 1983.

Clark, Gordon L. Interregional Migration, National Policy, and Social Justice. Totowa, N.J.: Rowman and Allenheld, Publishers, 1983.

Clark, Terry Nichols, ed. Urban Policy Analysis. Beverly Hills, Ca.: Sage Publications, 1981.

Clark, Terry Nichols, and Lorna Crowley Ferguson. City Money: Political Processes, Fiscal Strain and Retrenchment. New York: Columbia University Press, 1983.

Clark, Terry Nichols, G. Edward DeSeve, and J. Chester Johnson. Financial Handbook for Mayors and City Managers. New York: Van Nostrand Reinhold Company, 1985.

Crecine, John P., ed. Financing the Metropolis: Public Policy in Urban Economics. Beverly Hills, Ca.: Sage Publications, 1970.

Dexter, Lewis Anthony. Elite and Specialized Interviewing. Evanston, Ill.: Northwestern University Press, 1970.

Flax, Michael J. Survey of Urban Indicator Data, 1970-1977. Washington, D.C.: The Urban Institute, 1978.

Friedland, Roger. Power and Crisis in the City: Corporations, Unions and Urban Policy. London: The MacMillian Press, Ltd., 1982.

Garson, G. David. Handbook of Political Science Methods. Boston: Holbrook Press, Inc., 1968.

Glickman, Norman J., ed. The Urban Impacts of Federal Policies. Baltimore, Md.: The John Hopkins University Press, 1980.

Godwin, Stephen R., and George E. Peterson. Guide to Assessing Capital Stock Condition. Washington, D.C.: The Urban Institute Press, 1984.

Gold, Steven D. State and Local Fiscal Relations in the Early 1980s. Washington, D.C.: The Urban Institute Press, 1983.

Gorham, William, and Nathan Glazer, eds. The Urban Predicament. Washington, D.C.: The Urban Institute Press, 1976.

Government Finance Research Center of the Municipal Finance Officers Association. Indicators of Urban Conditions. Washington, D.C.: Government Finance Research Center, March 1982.

Government Finance Research Center of the Municipal Finance Officers Association. Building Prosperity: Financing Public Infrastructure for Economic Development. Washington, D.C: Government Finance Research Center, 1983.

Green, Harry A. Local Government Finance in Tennessee. Nashville: The Tennessee Advisory Commission on Intergovernmental Relations, 1982.

Grinnell, D. Jacque, and Richard R. Kochanek. Water Utility Accounting, 2nd ed. Washington, D.C.: American Water Works Association, 1980.

Grossman, David A. The Future of New York City's Capital Plant. Washington, D.C.: The Urban Institute Press, 1979.

Gurr, Ted Robert. Politimetrics: An Introduction to Quantitative Macropolitics. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972.

Hammer and Company Associates. The Economy of Metropolitan Knoxville. Knoxville, Tn.: The Metropolitan Planning Commission of Knoxville and Knox County, November 1962.

Hanson, Royce, ed. Perspectives on Urban Infrastructure. Washington, D.C: National Academy Press, 1984.

Harrison, Bennett. Urban Economic Development: Suburbanization, Minority Opportunity and the Condition of the Central City. Washington, D.C.: The Urban Institute Press, 1974.

Hatry, Harry P., and Bruce G. Steinthal. Guide to Selecting Maintenance Strategies for Capital Facilities. Washington, D.C.: The Urban Institute Press, 1984.

Hawley, Amos H. Urban Society: An Ecological Approach. New York: The Ronald Press Company, 1971.

Hobday, Victor C. Annexation Handbook for Cities and Towns in Tennessee, 2nd ed. Knoxville, Tn.: The Bureau of Public Administration, The University of Tennessee, January 1969.

Howell, James M., and Charles F. Stamm. Urban Fiscal Stress: A Comparative Analysis of 66 U.S. Cities. Lexington, Ma.: Lexington Books, 1979.

Humphrey, Nancy, George E. Peterson, and Peter Wilson. The Future of Cleveland's Capital Plant. Washington, D.C.: The Urban Institute Press, 1979.

Humphrey, Nancy, George E. Peterson, and Peter Wilson. The Future of Cincinnati's Capital Plant. Washington, D.C.: The Urban Institute Press, 1979.

Hunter, Floyd. Community Power Structure: A Study of Decision Makers. Chapel Hill: The University of North Carolina Press, 1953.

Kraft, Gerald, Alan R. Willens, John B. Kaler, and John R. Meyer. "On the Definition of a Depressed Area," in Essays in Regional Economics edited by John F. Kain and John R. Meyer. Cambridge, Ma.: Harvard University Press, 1971.

Martin, Joan K. Urban Financial Stress: Why Cities Go Broke. Boston: Auburn House Publishing Company, 1982.

McDonald, Michael J., and William Bruce Wheeler. Knoxville, Tennessee: Continuity and Change in an Appalachian City. Knoxville: The University of Tennessee Press, 1983.

Mikesell, John L. Fiscal Administration: Analysis and Applications for the Public Sector, 2nd ed. Chicago: The Dorsey Press, 1986.

Miller, Mary John, J. Chester Johnson, and George E. Peterson. The Future of Boston's Capital Plant. Washington, D.C.: The Urban Institute Press, 1981.

Miller, Mary John, Marcy Avrin, Bonnie Berk, and George E. Peterson. The Future of Oakland's Capital Plant. Washington, D.C.: The Urban Institute Press, 1981.

Mills, Edwin S. Urban Economics. Glenview, Ill.: Scott, Foresman and Company, 1972.

Muller, Thomas. Growing and Declining Urban Areas: A Fiscal Comparison. Washington, D.C.: The Urban Institute Press, 1976.

Norton, R. D. City Life-Cycles and American Urban Policy. New York: Academic Press, 1979.

Peterson, George E., Mary John Miller, Stephen R. Godwin, and Carol Shapiro. Guide to Benchmarks of Urban Capital Condition. Washington, D.C.: The Urban Institute Press, 1984.

Peterson, Paul E. City Limits. Chicago: The University of Chicago Press, 1981.

Peterson, Paul E., ed. The New Urban Reality. Washington, D.C.: The Brookings Institution, 1985.

Vernon, Raymond. The Changing Economic Function of the Central City. New York: Committee for Economic Development, 1959.

Wasby, Stephen L. Political Science: The Discipline and Its Dimensions, An Introduction. New York: Charles Scribner's Sons, 1970.

Weicher, John C. "The Effects of Metropolitan Political Fragmentation on Central City Budgets" in Models of Urban Structure edited by David C. Sweet. Lexington, Ma.: Lexington Books, 1972.

Wildavsky, Aaron. The Politics of the Budgetary Process. Boston: Little, Brown and Company, 1964.

Wilson, Peter. The Future of Dallas's Capital Plant. Washington, D.C.: The Urban Institute Press, 1980.

Wood, Robert C. 1400 Governments. Cambridge, Ma.: Harvard University Press, 1961.

Yong, Hyo Cho, and David Puryear. "Distressed Cities: Targeting HUD Programs" in Urban Revitalization edited by Donald B. Rosenthal. Beverly Hills, Ca.: Sage Publications, 1980.

B. PERIODICALS

Clark, Terry Nichols. "Community Social Indicators: From Analytical Models to Policy Applications," Urban Affairs Quarterly, 9 (September 1973), 3-36.

Hill, Richard Child. "Separate and Unequal: Governmental Inequality in the Metropolis," American Political Science Review, 68 (December 1974), 1557-1568.

Holden, Matthew. "The Governance of the Metropolis as a Problem in Diplomacy," Journal of Politics, 26 (August 1964), 627-647.

Kasarda, John D. "The Impact of Suburban Population Growth on Central City Service Functions," American Journal of Sociology, 77 (1972), 1111-1124.

Nathan, Richard P., and Charles Adams. "Understanding Central City Hardship," Political Science Quarterly, 91 (Spring 1976), 47-62.

Salanick, Gerald R., and Jeffrey Pfeffner. "Constraints on Administrative Discretion: The Limited Influence of Mayors on City Budgets," Urban Affairs Quarterly, 12 (1977), 475-498.

Tiebout, Charles M. "A Pure Theory of Local Expenditures," The Journal of Political Economy, 64 (October 1956), 416-424.

Wheeler, Raymond H. "Annexation Law and Annexation Success," Land Economics, 41 (November 1965), 354-360.

Wood, Robert C. "Metropolitan Government, 1975: An Extrapolation of Trends," The American Political Science Review, March 1958, 108-122.

C. THESIS OR DISSERTATION

Pagano, Michael A. "Fiscal Stress and the Financing of Urban Infrastructure." Ph.D. diss., University of Texas at Austin, 1980.

D. KNOXVILLE, KNOX COUNTY GOVERNMENTS PUBLICATIONS

Knoxville, Department of Finance. Financial Statements, 1960 prepared by Price, Waterhouse and Company, February 13, 1961.

Knoxville, Department of Finance. Financial Statements, 1961 prepared by Price, Waterhouse and Company, February 13, 1962.

Knoxville, Department of Finance. Audit Report, 1962 prepared by Joe E. Henry and Company, February 28, 1963.

Knoxville, Department of Finance. Audit Report, 1963 prepared by Herbert I. Brown, February 13, 1964.

Knoxville, Department of Finance. Audit Report, 1964 prepared by Herbert L. Brown, February 11, 1965.

Knoxville, Department of Finance. Annual Financial Report, 1965 prepared by Ernst and Ernst, February 24, 1966.

Knoxville, Department of Finance. Annual Financial Report, 1966 prepared by Ernest and Ernst, February 13, 1967.

Knoxville, Department of Finance. Annual Financial Report, 1967 prepared by Ernst and Ernst, February 2, 1968.

Knoxville, Department of Finance. Annual Financial Report, 1968 prepared by Ernst and Ernst, February 10, 1969.

Knoxville, Department of Finance. Annual Financial Report, 1969 prepared by Miller and Cordell, February 23, 1970.

Knoxville, Department of Finance. Annual Financial Report, 1970 prepared by Miller and Cordell, February 9, 1971.

Knoxville, Department of Finance. Annual Financial Report, 1971 prepared by Miller and Cordell, February 4, 1972.

Knoxville, Department of Finance. Annual Financial Report, 1972 prepared by Ernst and Ernst, February 12, 1973.

Knoxville, Department of Finance. Annual Financial Report, 1973 prepared by Ernst and Ernst, May 30, 1974.

Knoxville, Department of Finance. Annual Financial Report, 1974 prepared by Miller and Cordell, March 3, 1975.

Knoxville, Department of Finance. Annual Financial Report, 1975 prepared by Miller and Cordell, March 3, 1976.

Knoxville, Department of Finance. Annual Financial Report, 1976 prepared by Miller and Cordell, March 7, 1977.

Knoxville, Department of Finance. Annual Financial Report, 1977-1978 prepared Peat, Marwick, Mitchell & Co., September 1, 1978.

Knoxville, Department of Finance. Annual Financial Report, 1979 prepared by Peat, Marwick, Mitchell & Co., September 7, 1979.

Knoxville, Department of Finance. Annual Financial Report, 1980 prepared by Peat, Marwick, Mitchell & Co., September 11, 1980.

Knoxville, Department of Finance. Annual Financial Report, 1981 prepared by Peat, Marwick, Mitchell & Co., November 12, 1981.

Knoxville, Department of Finance. Annual Report, 1982 prepared by Coopers & Lybrand, October 29, 1982.

Knoxville-Knox County, Metropolitan Planning Commission. "Poverty," Knoxville, Tn.: January 20, 1976.

E. UNITED STATES GOVERNMENT PUBLICATIONS

U.S. Department of Commerce, Bureau of Census. Characteristics of the Population: General Population Characteristics, Tennessee, No. PC80-1-B44. Washington, D.C.: U.S. Government Printing Office, 1980.

U.S. Department of Commerce, Bureau of Census. 1970 Census of Population and Housing: Census Tracts, Knoxville, Tennessee, SMSA and Adjacent Areas, Series PHC (1)-101. Washington, D.C.: U.S. Government Printing Office, 1970.

U.S. Department of Commerce, Bureau of the Census. County and City Data Book, 1962. Washington, D.C.: U.S. Government Printing Office, June 1962.

U.S. Department of Commerce, Bureau of the Census. County and City Data Book, 1972. Washington, D.C.: U.S. Government Printing Office, March 1973.

U.S. Department of Commerce, Bureau of the Census. County and City Data Book, 1983. Washington, D.C.: U.S. Government Printing Office, 1983.

U.S. Department of Commerce, Bureau of Census. 1980 Census of Housing, Metropolitan Housing Characteristics, Knoxville, Tn., Series HC 80-2-203. Washington, D.C.: U.S. Government Printing Office, 1981.

U.S. Department of Commerce, Bureau of Census. 1960 U.S. Census of Housing, Series HC (3)-367. Washington, D.C.: U.S. Government Printing Office, 1961.

U.S. Department of Commerce, Bureau of Census. 1982 Census of Service Industries: Geographic Area. Washington, D.C.: U.S. Government Printing Office, November 1984.

U.S. Department of Commerce, Bureau of Census. 1963 Census of Business, Major Retail Center Statistics, Vol. 3. Washington, D.C.: U.S. Government Printing Office, 1965.

U.S. Department of Commerce, Bureau of Census. 1972 Census of Wholesale Trade: Area Statistics, Vol. 2. Washington, D.C.: U.S. Government Printing Office, July 1976.

U.S. Department of Commerce, Bureau of Census. 1982 Census of Wholesale Trade: Geographic Area Series. Washington, D.C.: U.S. Government Printing Office, November 1984.

U.S. Department of Commerce, Bureau of Census. 1963 U.S. Census of Manufactures: Area Statistics, Vol. 3. Washington, D.C.: U.S. Government Printing Office, 1965.

U.S. Department of Commerce, Bureau of Census. Boundary and Annexation Survey, 1970-1975, Series GE-30-1. Washington, D.C.: U.S. Government Printing Office, 1978.

U.S. Department of Commerce, Bureau of Census. Boundary and Annexation Survey, 1970-1979, Series GE-30-4. Washington, D.C.: U.S. Government Printing Office, 1980.

U.S. Environmental Protection Agency. Analysis of Operations and Maintenance Costs for Municipal Wastewater Treatment Systems, prepared by Dames & Moore, Water Pollution Control Engineering Services, Denver Colorado for Office of Water Program Operations, Environmental Protection Agency. Washington, D.C.: U.S. Government Printing Office, February 1978.

U.S. Environmental Protection Agency. Handbook for Sewer System Evaluation and Rehabilitation. Washington, D.C.: Municipal Construction Division, Office of Water Programs Operations, Environmental Protection Agency, December 1975.

F. MISCELLANEOUS PUBLICATIONS

Center for Business and Economic Research. Tennessee Statistical Abstract, 1968. Knoxville: Center for Business and Economic Research, College of Business Administration, The University of Tennessee, December 1968.

Center for Business and Economic Research. Tennessee Statistical Abstract, 1974. Knoxville: Center for Business and Economic Research, College of Business Administration, The University of Tennessee, April 1974.

Center for Business and Economic Research. Tennessee Statistical Abstract, 1977. Knoxville: Center for Business and Economic Research, College of Business Administration, The University of Tennessee, July 1977.

Center for Business and Economic Research. Tennessee Statistical Abstract, 1980. Knoxville: Center for Business and Economic Research, College of Business Administration, July 1980.

Center for Business and Economic Research. Tennessee Statistical Abstract, 1983/84. Knoxville: Center for Business and Economic Research, College of Business Administration, The University of Tennessee, August 1983.

International City Management Association. The Municipal Year Book, 1975, Vol. 42. Washington, D.C.: International City Management Association, 1976.

G. UNPUBLISHED INTERVIEWS

Robert Bowers, Director, Engineering Department, City of Knoxville, interviewed by author, 27 May 1987.

Bill R. Elmore, Director, Waste Water Control System, City of Knoxville, interviewed by author, 9 February 1987.

Herb Kidd, Director, Public Service Department, City of Knoxville, interviewed by author, 27 May 1987.

Stephen King, Deputy Director, Engineering Department, City of Knoxville, interviewed by author, 27 May 1987.

H. NEWSPAPERS

The Knoxville Journal (Knoxville, Tennessee).

The Knoxville News-Sentinel (Knoxville, Tennessee).

APPENDICES

APPENDIX A

SAMPLE OF TWENTY-ONE SOUTHEASTERN CITIES AND INDICATORS

Cities	Indicators
Huntsville, AL	Land Area
Montgomery, AL	Population
Little Rock, AR	Civilian Labor Force
Ft. Lauderdale, FL	Government Employees
Orlando, FL	Manufacturing Employees
Columbus, GA	Unemployment Rate
Macon, GA	Housing Units Occupies
Savannah, GA	Rental-Occupied Housing
Lexington, KY	Owner-Occupied Housing
Baton Rouge, LA	Families Below Poverty
Shreveport, LA	Median Income
Jackson, MS	Per Capita Income
Charlotte, NC	General Government Expenses
Durham, NC	Police Expenditures
Greensboro, NC	Highway Expenditures
Raleigh, NC	Debt Outstanding
Columbia, SC	FTE City Employees
Chattanooga, TN	Property Tax
Knoxville, TN	Total Revenues
Memphis, TN	Total Taxes
Nashville, TN	Sales Taxes
	Intergovernmental Revenues

APPENDIX B

SEWER SYSTEM QUESTIONNAIRE

A. COLLECTION SYSTEM

I. SEWER LINE MILEAGE

1. In the years shown below, how many miles of sewer lines were there in Knoxville in the listed categories?

Years	1960	1970	1980
Category	Mileage		
Main Lines	_____	_____	_____
Intercepting Lines	_____	_____	_____
Outfall Lines	_____	_____	_____
Lateral Lines	_____	_____	_____
Sewer Force Main	_____	_____	_____
Other Sewer Lines	_____	_____	_____

2. In the years shown below, how many miles of sewer line were part of the City of Knoxville sewer system but outside of the city's limits?

Years	1960	1970	1980
Category	Mileage		
Main Lines	_____	_____	_____
Intercepting Lines	_____	_____	_____
Outfall Lines	_____	_____	_____
Lateral Lines	_____	_____	_____
Sewer Force Main	_____	_____	_____
Other Sewer Lines	_____	_____	_____

3. In 1960, 1970 and 1980, what percent of the total miles of sewer lines were combined storm/sewer lines?

Years	1960	1970	1980
	Combined Sewers		
Percent	_____	_____	_____

4. In 1960, 1970 and 1980, how much was spent by the City of Knoxville for new sewer line construction?

Years	1960	1970	1980
	Expended for New Construction		
Dollars	$_____	$_____	$_____

II. SEWER LINE CONDITION ASSESSMENT

1. In 1960, 1970 and 1980, what percent of the sewer system's total miles of collection lines were constructed during the periods shown?

Years	1960	1970	1980
Time Periods	Percentage		
1980 to 1960	_____	_____	_____
1959 to 1940	_____	_____	_____
1939 to 1920	_____	_____	_____
Prior to 1920	_____	_____	_____

2. In 1960, 1970 and 1980, what were the number of sewer line breaks per 100 miles of sewer lines?

Year	1960	1970	1980
	Breaks Per 100 Miles		
Number	_____	_____	_____

3. In 1960, 1970 and 1980, what were the number of sewer line backups per 100 miles of sewer lines?

Year	1960	1970	1980
	Backups Per 100 Miles		
Number	_____	_____	_____

4. In the City of Knoxville EPA Sewer System Evaluation Survey (SSES), what was the amount of infiltration and inflow measured for the total system?

_____ gallons per day per inch of pipe diameter per mile of pipe line.

III. SEWER LINE MAINTENANCE

1. In 1960, 1970 and 1980, indicate the amount of sewer line maintenance by the number of miles of sewer lines flushed, rodded, or otherwise cleaned.

Year	1960	1970	1980
	Miles Cleaned		
Number	_____	_____	_____

2. In 1975, 1978 and 1981, indicate the amount of sewer line maintenance by the number of miles of sewer lines inspected by television inspection process.

Year	1975	1978	1981
	Miles TV Inspection		
Number	_____	_____	_____

3. In 1975, 1978 and 1981, indicate the amount of sewer line maintenance by the number of sewer line pipe joint sealed.

Year	1975	1978	1981
	Joints Sealed		
Number	_____	_____	_____

4. In 1960, 1970 and 1980, how much was spent by the City of Knoxville for sewer line maintenance and repair?

Year	1960	1970	1980
	Expended for Maintenance, Repairs		
Dollars	$_____	$_____	$_____

B. TREATMENT SYSTEM

I. TREATMENT SYSTEM INVENTORY

1. In 1960, 1970 and 1980, what was the total treatment plant capacity in millions of gallons per day?

Year	1960	1970	1980
	Treatment Capacity		
MGD	_____	_____	_____

2. In 1960, 1970 and 1980, what was the average daily flow of wastewater in MGD receiving levels of treatment indicated below?

Year	1960	1970	1980
Levels of Treatment	Million Gallons Per Day		
Primary	_____	_____	_____
Secondary	_____	_____	_____
Tertiary	_____	_____	_____

3. In 1960, 1970 and 1980, what was the nominal value of the city's treatment plant system?

Year	1960	1970	1980
	Nominal Values		
Dollars	$_____	$_____	$_____

APPENDIX C

STREETS AND ROADS QUESTIONNAIRE

I. STREET AND ROAD MILEAGE IN KNOXVILLE

All of these questions pertain to streets and roads within the city limits of Knoxville regardless of jurisdictional responsibility.

1. In the years shown below, how many miles of paved streets and roads were there in Knoxville in the listed categories?

Years	1960	1970	1980
Category	Mileage		
Interstate Highways	_____	_____	_____
Arterials	_____	_____	_____
Collectors	_____	_____	_____
Residential	_____	_____	_____

2. Of the new street and road mileage added to the city's total inventory from 1960 to 1970 and from 1970 to 1980, please indicate the percent of construction by government, private development, or other sources.

Period	1960 to 1970	1970 to 1980
Source	Percentage	
City	_____	_____
County	_____	_____
State	_____	_____
Federal	_____	_____
Private Development (Dedicated to City)	_____	_____
Annexed	_____	_____

II. JURISDICTIONAL RESPONSIBILITY

1. Considering the total miles of streets and roads existing within the city limits of Knoxville in the stated years, what is the percent distribution of responsibility for repairing and maintaining those streets?

Years	1960	1970	1980
Jurisdiction	Percentage		
City	_____	_____	_____
County	_____	_____	_____
State	_____	_____	_____
Federal	_____	_____	_____

2. What is the percent distribution of financial responsibility for repairing and maintaining of streets and roads existing within the city limits of Knoxville in the stated years?

Years	1960	1970	1980
Jurisdiction	Percentage		
City	_____	_____	_____
County	_____	_____	_____
State	_____	_____	_____
Federal	_____	_____	_____

III. STREET AND ROAD CONDITION ASSESSMENT

1. Using the condition ratings of the Federal Highway Administration which are attached, please rate the condition of streets and roads in Knoxville for years stated.

Years	1960	1970	1980
Ratings	Mileage		
Very Good	_____	_____	_____
Good	_____	_____	_____
Fair	_____	_____	_____
Poor	_____	_____	_____
Very Poor	_____	_____	_____

2. Using nominal values, what would be cost estimates per unit (Sq. Yd.) to repair and restore streets below the GOOD rating in the years states? The estimates should restore the street to at least 90 percent of its design life.

Years	1960	1970	1980
Ratings	Unit Estimates		
Fair	_____	_____	_____
Poor	_____	_____	_____
Very Poor	_____	_____	_____

3. In the years listed below, how many miles of streets were repaired and restored to at least 90 percent of its design life in the category ratings below GOOD?

Years	1960	1970	1980
Ratings	Mileage		
Fair	_____	_____	_____
Poor	_____	_____	_____
Very Poor	_____	_____	_____

4. What were the actual expenditures for repairing and restoring the streets in the stated rating categories and years? What percent of expenditures were paid by City funds?

Years	1960		1970		1980	
Ratings	Expended	% City	Expended	% City	Expended	% City
Fair						
Poor						
Very Poor						

5. In the years stated were there any repairs or restoration of streets in the following rated categories? If there were, how many miles?

Years	1960	1970	1980
Ratings	Mileage		
Very Good			
Good			

6. Using nominal values, what would be cost estimates per unit (Sq. Yd.) to repair and restore streets in these rating categories to 100 percent of design life in years stated?

Years	1960	1970	1980
Ratings	Unit Estimates		
Very Good			
Good			

7. What were the actual expenditures for repairing and restoring the streets in the stated rating categories and years? What percent of expenditures were paid by City funds?

Years	1960		1970		1980	
Ratings	Expended	% City	Expended	% City	Expended	% City
Very Good						
Good						

8. Using the condition ratings of the Federal Highway Administration which are attached, please rate the mileage of streets and roads under the City of Knoxville jurisdiction as GOOD, FAIR, or POOR in the years stated. Please not that the mileage ratings are broken down into use type categories.

Years	1960	1970	1980
Category			
Ratings	Mileage		
Arterials			
Good			
Fair			
Poor			
Collectors			
Good			
Fair			
Poor			
Residentials			
Good			
Fair			
Poor			

PAVEMENT CONDITION RATING

PSR	Verbal Rating	Description
5	Very Good	Only new (or nearly new) pavements are likely to be smooth enough and sufficiently free of cracks and patches to qualify for this category. All pavements constructed or resurfaced during the last year should be rated very good.
4	Good	Pavements in this category, although not quite as smooth as those described above, give a first-class ride and exhibit few, if any, visible signs of surface deterioration. Flexible pavements may be beginning to show evidence of rutting and fine random cracks. Rigid pavements may be beginning to show evidence of slight surface deterioration, such as minor cracks and spalling.
3	Fair	The riding qualities of pavements in this category are noticeably inferior to those of new pavements, and may be barely tolerable for high-speed traffic. Surface defects of flexible pavements may include rutting, map cracking, and more or less extensive patching. Rigid pavements in this group may have a few joint failures, faulting and cracking, and some pumping.
2	Poor	Pavements that have deteriorated to such an extent that they are in need of resurfacing.
1	Very Poor	Pavements which are in an extremely deteriorated condition and may even need complete reconstruction.
0		

Source: Federal Highway Administration, Highway Performance Monitoring System, Field Manual, U.S. Department of Transportation.

APPENDIX D

BRIDGE QUESTIONNAIRE

I. BRIDGE INVENTORY AND JURISDICTION

1. How many bridges were there within the city limits of Knoxville in the years indicated?

Years	1960	1970	1980
	Number		
Bridges	_____	_____	_____

2. Please indicate the number, the length in yards, and the jurisdiction which has responsibility for repair and maintenance of these bridges.

Years	1960	1970	1980
Jurisdiction	Number/Yards		
City	___/___	___/___	___/___
County	___/___	___/___	___/___
State	___/___	___/___	___/___
Federal	___/___	___/___	___/___

3. This question is not a repetition of the above, but clarifies it. Please indicate the number of bridges and total yards for which the city has sole responsibility for maintenance and repair, and the number and yards in which there is dual responsibility with the city. Please write in the other jurisdiction with responsibility.

Years	1960	1970	1980
Jurisdiction	Number/Yards		
City	___/___	___/___	___/___
City/	___/___	___/___	___/___
City/	___/___	___/___	___/___
City/	___/___	___/___	___/___
City/	___/___	___/___	___/___

II. BRIDGE CONDITION ASSESSMENT

1. Of the total bridges within the city limits of Knoxville please indicate the number of bridges which were structurally deficient in the years indicated. Please break down the number by jurisdictional responsibility.

   NOTE: A structurally deficient bridge is one that has been either restricted to light vehicles (posted) or closed because of structural inadequacy.

Years	1960	1970	1980
Jurisdiction	Number Structurally Deficient		
City			
County			
State			
Federal			

2. Of the total bridges within the city limits of Knoxville please indicate the number of bridges which were functionally obsolete in the years shown. Please break down the figures by jurisdictional responsibility.

   NOTE: A functionally obsolete bridge is one that has a deck geometry, approach, roadway alignment, or load-carrying capacity which can no longer safely service its road system.

Years	1960	1970	1980
Jurisdiction	Number Functionally Obsolete		
City			
County			
State			
Federal			

3. Categorize the bridges within the city's limits which were structurally deficient in 1980 by average daily traffic usage and jurisdictional responsibility.

Year	1980		
Jurisdiction	Greater than 10,000 Vehicles	2,000 to 10,000 Vehicles	Less than 2,000 Vehicles
City			
County			
State			
Federal			

4. Categorize the bridges within the city's limits which were functionally obsolete in 1980 by average daily traffic usage and jurisdictional responsibility.

Year	1980		
Jurisdiction	Greater than 10,000 Vehicles	2,000 to 10,000 Vehicles	Less than 2,000 Vehicles
City			
County			
State			
Federal			

5. In the time period from 1960 to 1982 have there been any annual expenditures over $10,000 for maintenance and repair of bridges under the jurisdiction of the city? If the answer is yes, please indicate the years and the amounts.

Year	Amount
	$
	$
	$
	$
	$
	$

Year	Amount
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____

APPENDIX E

FORMULA FOR CONVERTING SQUARE YARD UNIT COSTS TO COSTS PER MILE

RESIDENTIAL STREET

Assumed Width: 26 feet

1 L. Ft. = 26 x 1 = 26 Sq. Ft.

26 ÷ 9 Sq. Ft. per Sq. Yd. = 2.888 Sq. Yd. per L. Ft.

Cost per Sq. Yd. x 2.888 = Cost per L. Ft.

Cost per L. Ft. x 5280 L. Ft. per Mile = Cost per Mile

COLLECTOR STREET

Assumed Width: 32 feet

1 L. Ft. = 32 Sq. Ft. ÷ 9 = 3.556 Sq. Yd. per L. Ft.

Cost per Sq. Yd. x 3.556 = Cost per L. Ft.

Cost per L. Ft. x 5280 L. Ft. = Cost per Mile

ARTERIAL STREET

Assumed Width: 48 feet

1 L. Ft. = 48 Sq. Ft. ÷ 9 = 5.33 Sq. Yd. per L. Ft.

Cost per Sq. Yd. x 5.33 = Cost per L. Ft.

Cost per L. Ft. x 5280 = Cost per Mile

VITA

Antoinette Thompson was born in Montgomery, Alabama, on January 16, 1942. She was graduated from Jones Valley High School in Birmingham, Alabama in 1960. She was awarded a Bachelor of Arts degree cum laude from Birmingham-Southern College in 1970.

She entered the Graduate School at The University of Tennessee, Knoxville, in September 1970, and received the Master of Arts degree with a major in political science in June 1974. She went to work in July of 1974 as a Fiscal Analyst for the Fiscal Review Committee, a statutory committee of the Tennessee General Assembly. In September of 1976 she returned to The University of Tennessee to begin work on a doctoral degree. In April of 1977 she went to work for the City of Knoxville with the Community Development Office which administered the city's Community Development Block Grant program. From August 1980 to June 1987 she was Administrative Services Chief for the City of Knoxville, Waste Water Control System.

After receiving her Doctor of Philosophy degree with a major in political science in August 1987, she joined the faculty of the Political Science Department of Kent State University, Kent, Ohio, as an assistant professor.

She was active in the East Tennessee Chapter of the American Society for Public Administration, serving on its Council and as Treasurer.