

LAWRENCE RIVERFRONT REGION
A SUGGESTED URBAN REVITALIZATION

by

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Introduction

INTRODUCTION

Water is forever on the move. The beauty of water and all of its many forms have inspired countless works of art and poetry.

Lao-Tse paid considerable attention to water's cyclic process of meteorology, which is physical and spiritual, observing that:

Water never rests, neither by day nor by night. When flowing above, it causes rain and dew. When flowing below, it forms streams and rivers. Water is outstanding in doing good. If a dam is raised against it, it stops. If a way is made for it, it flows along that path. Hence it is said that it does not struggle. And yet it has no equal in destroying that which is strong and hard.¹

From Seattle to Los Angeles, from Houston to Miami, and Miami to New York, water pounds in waves against the shore. Man has chosen the coastal zone as the preferential place for his largest cities. The industrial-commercial activity within the coastal zone is enormous, as is its on-shore and off-shore production of fossil fuels and other mineral resources. The coastal zone is also one of the most desirable locations for recreation. The migration of inland residents to coastal recreation area is an annual phenomenon of massive proportion.²

The most conspicuous of all moving waters are the rivers. Rivers differ from standing waters not only in their continuous motion, but also in their longitudinal diversity; turbulent rocky stretches may alternate with quiet parts. As the shore lines of rivers are relatively much greater than lakes, the intimate connection between subsequent landscapes and river waters are enhanced. River water continuously passes away, creating profoundly different conditions for life.³

Famous rivers such as the Hudson, the James, the Mississippi, the Missouri, the Columbia, and many more, were the first trails to the interior for early exploration and settlement of the American continent. Since then, of more than three million miles of rivers and tributaries pouring their waters down to the sea, many have been harnessed for flood control, navigation, hydro-

electric power, municipal and industrial water supply, and irrigation. Cities, factories and homes have been built on their flood plains. Their banks have been dumping grounds for waste materials and their waters the recipient of industrial and municipal wastes. In many ways, the beauty and purity of these streams have been mindlessly destroyed. It has degraded drinking water and destroyed the values of fish, wildlife and scenic and recreation resources.⁴

The need to preserve portions of a national heritage is not new. In 1961, the Senate Select Committee on National Water Resources recommended:

That certain streams be preserved in their free-flowing condition because their natural scenic, scientific, aesthetic and recreational values outweigh their value for water development and control purposes now and in the future.⁴

This recommendation was reinforced by the Outdoor Recreation Resources Review Commission when it concluded in its final report in January, 1962, that: "Certain rivers should be preserved in their free-flowing condition and natural setting."⁴

The Wild and Scenic Rivers Act established three classes of rivers - wild, scenic, and recreational. The differences among the various classifications are the degree to which there is evidence of man's presence in the river environment. Wild rivers essentially provide primitive experiences with little or no evidence of man's presence; they are generally inaccessible except by trail. Scenic rivers, while largely primitive and relatively undeveloped, are accessible in some places by road. Recreational rivers are readily accessible by road or railroad and have some development along their shorelines.

While the Wild and Scenic Rivers Act established a National Wild and Scenic Rivers System in October, 1968, both state and federal agencies tried to identify, evaluate, and protect scenic waterways through the efforts of the various units of government and joint public-private organizations.

People are discussing the problems relating to our national rivers, but

little has been directed specifically to the problems which deal with the development and/or redevelopment of our urban riverfronts. As a matter of fact, urban riverfronts have been frequently neglected for improving the quality of life in the city. The riverfront is a "dirty" word in many American cities, because it is a dirty place. But why? In some European cities and in much of the countryside, the rivers are places of beauty, and streams of life, as they should be. Appendix A shows a comparison between historic development of American and European river use.

It is, therefore, the intent and purpose of this research to suggest the redevelopment of urban riverfronts as one method of creating new resources of economic life, namely, to attract a variety of daytime and evening users into downtown areas and to keep the neighborhoods populated with active citizens. A suggested urban redevelopment plan for Lawrence Riverfront will finally be proposed. Hopefully, the scope of this thesis will cover the following areas:

A. Physical Phase:

1. Comprehensive concern of overall planning along original riverfront, its downtown and adjoining historic neighborhoods as the basic guidelines in matters of design.
2. Avoid misuse of resources.
3. Continuity of growth and maintainance of environmental quality.
4. Revitalization impacts in urban riverfront regions.
5. The policy to encourage historic preservation (or conservation) and stimulate development of open spaces, pedestrian walkways . . . etc. from both the public and private sectors.

B. Aesthetic Phase:

Diversity created in man's environment.

CHAPTER I

Urban Riverfronts

Chapter I

URBAN RIVERFRONTS

The History and Advantages of Urban Riverfront* Redevelopment

American cities have almost universally treated their riverfronts as prime commercial and industrial land; most of them did not consider the aesthetic and recreational values when their early city plans were laid out. Much of the development in traditional river towns since 1930's has ignored the landscape, turning away from the existing interface between the town and its river.⁵ Pleasant areas of human scale in towns and cities along the river are rare. At times, the river even appears to be a negative element.

The existence of decay on the urban riverfront region is so evident that a city no longer considers its central riverfront as a part of its economic life. The result allows refuse and objectionable land uses to find their way to the shoreline.

Over a century or so during the past, American cities have turned their backs on their riverfronts. Recently, however, several cities have begun to rediscover and reassess the contribution to the quality of urban life in these intriguing areas and revitalization has taken place along the rivers. In other words, cities are looking at their riverfronts with an eye toward making them useful sites for active recreation, passive enjoyment, and having them serve as important elements in the aesthetics of the city.

Some factors obviously make riverfront reuse feasible. First of all, the changing industrial and transportation needs of the American economy make

* "Urban Riverfront" is defined as lands adjacent to rivers in cities with wide valley bottoms.

riverfront lands more available. With the advent of containerized shipping, once thriving ports have become obsolete virtually overnight. Container ports require great land areas to accommodate the huge, tracked cranes that handle giant containers the size of railroad boxcars, and vast parking areas and roadways for the trailer-trunks that pick up and deliver the containers. Old ports in congested downtowns generally cannot service the new shipping industry.⁶ Riverfront activities receded as a result of the growth of interstate highways and the trucking industry. At the same time, the need for recreational opportunities close to population centers has increased because more leisure time and leisure money are available.⁶

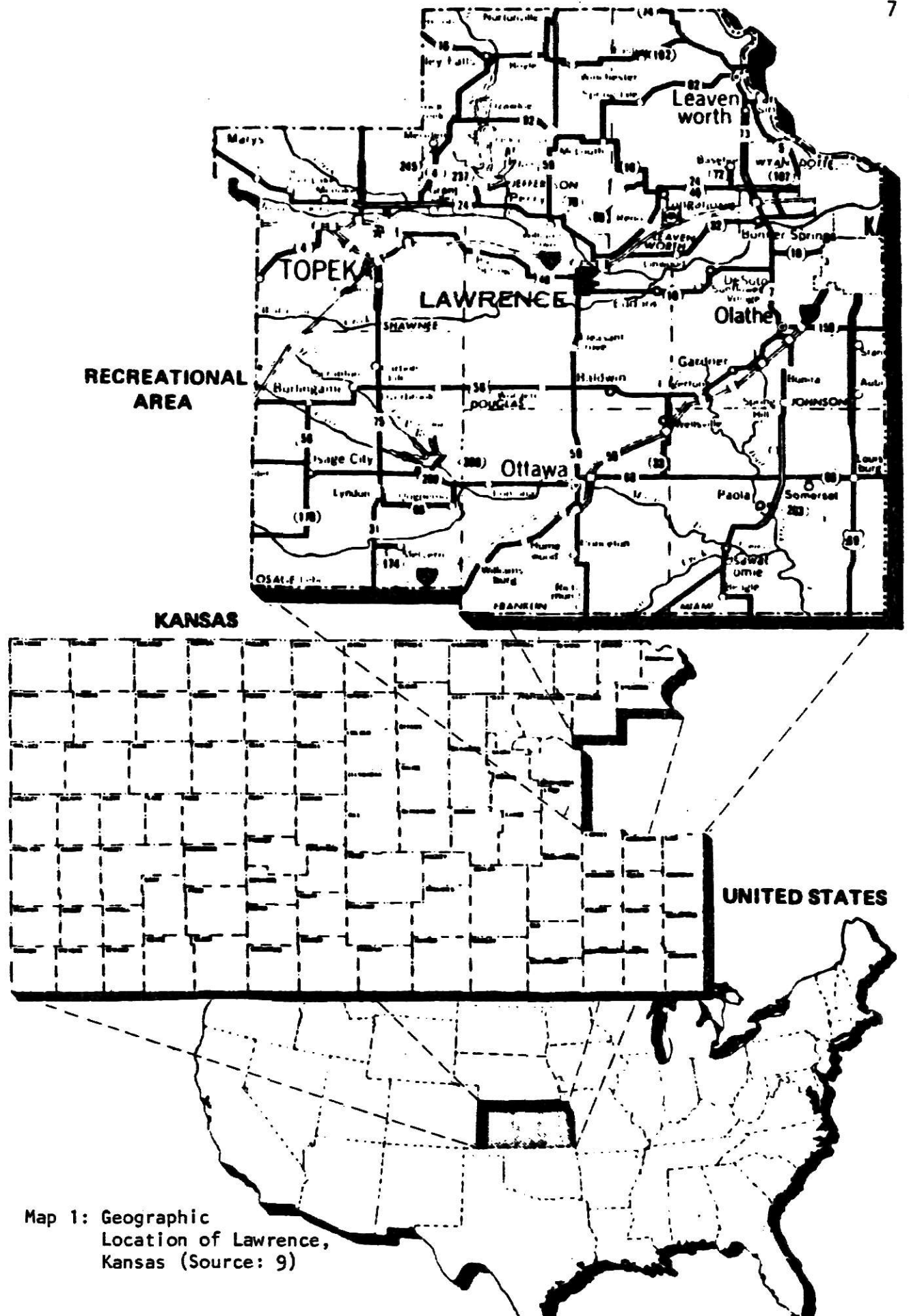
We all know that the nation's urban problems of today are most acute. The cores of most cities are declining. Highways and urban transit facilities make the exodus to the suburb easier. People of more than average income are moving away from cities in search of a better living environment. For a while, the suburbs seemed to be the solution, but today's energy shortage has its impact on both the local and national economics. The limited availability of oil and natural gas has an effect on the future of economic growth and land-use development. It is now becoming necessary for cities to reverse the trend of migration, and become self-conscious about the design of river and riverfront resources. Cities must recognize the riverfronts aesthetic potential, not only for park development, but also for the design and use of commercial and industrial riverfront to provide contrast, interest, historic identity and visual unity. Midst the rubble and rundown structures along the river's edge exists a possibility of providing varied aesthetic pleasures for modern man. Redevelopment is an excellent means of making the possible actual.⁷

There is every reason for us to improve a riverfront's environment in terms of appearance and other functional amenities as part of an effort to attract people back to the cities from suburban areas.

The Riverfront Site in Lawrence, Kansas

Lawrence, the county seat of Douglas County, is located 27 miles east of Topeka and 45 miles west of Kansas City. It is a city with both potential and problems. Some of its potential include the basic resource represented by the University of Kansas, a good regional location, an impressive environmental location on the banks of the Kansas River, and a growing population base. Its problems include matters common to many similar cities in the United States such as loss of potential retail business and customers to outlying areas and regional shopping centers one half hour away in Topeka and Kansas City, some decaying inner city housing stock, commercial and industrial intrusion into residential areas, and outdated use of the areas and structures in the city.⁸ The Lawrence geographic location is illustrated in Map 1.

The city of Lawrence has made several moves to protect the Central Business District (C.B.D.). Prominent among these moves are the renewal efforts in the early 1970's and the recent commitment to the construction of the new city hall at the north end of the C.B.D., where Massachusetts crosses the Kansas River. It is felt that riverfront redevelopment perhaps is indeed the method to enhance the city physically and aesthetically, and favorably affect the quality of life in Lawrence.



Map 1: Geographic
Location of Lawrence,
Kansas (Source: 9)

CHAPTER II

Selected Case Studies

Chapter II

SELECTED CASE STUDIES

About fifty American cities are undertaking federally assisted urban renewal programs along their riverfronts. Each riverfront renewal program must respond to the particular problems posted; no two are alike.⁷

To help understand the nature of riverfront redevelopment of the three selected sample cities and problems associated with them, a detailed description of each is included according to the following aspects:

1. Cultural and Historical Development
2. The Problems of the River Itself
3. Visual Analysis
4. Physical Factors Determining Riverfront Redevelopment
5. Actions
6. Management and Government Function

Because the three post-design studies and some other riverfronts under construction or in the design stages clearly exemplify certain basic issues and questions revolving around the riverfront, an assembly of significant quotation and design formats can serve as background guidelines for decision making. The findings pertaining to the purpose of urban riverfront growth, physical and aesthetic approaches would help in solving the problems in the Lawrence riverfront revitalization.

NEW ORLEANS URBAN RIVERFRONT REGION, LOUISIANA

Cultural and Historical Development

New Orleans has a unique and colorful background. It was founded by Bienville in 1718 as a French colony; became a French crown colony in 1731; was given to King Charles III of Spain secretly by Louis XV, in 1762; was under Spanish rule from 1766 to 1803 when it was transferred back to France. That

same year New Orleans was sold by France to the United States in the famous Louisiana Purchase.¹⁰ This old-new city exists as an identifiable place - a city of strong character, a people with a sense of loyalty to the city, a city of people with tolerance for human frailties. White, Black, French and "American" influences mix in a jambalaya that is uniquely New Orleans. It merits the distinction of being called America's Most Interesting City.¹¹

The Port of New Orleans is the major port of the Gulf Coast and one of the three principal ports in the United States. Its geographic position is unique. Situated centrally on the Gulf Coast and at the confluence of the giant Intracoastal and Mississippi River waterway systems, the Port serves as the gateway to the world for the mid-continental United States. The metropolitan area of New Orleans is the hub of industry, agriculture and transportation for the entire State of Louisiana.¹²

Since 1811, when the first paddle wheel steamboat arrived at New Orleans, the Port has been responsive to new developments in shipping technology. The replacement of flatboats with steamboats was a revolutionary event in the 19th Century, but the changes taking place in shipping today will have even greater impact. The pressures of shipping economics have forced the development of ships which are faster on the seas and require only brief stops at their ports of call. The container terminal requires extensive backland areas and railroad service as well as excellent highway access for trucks. Existing riverfront wharves can meet these needs only temporarily and to a limited extent. New types of terminals must be designed and built to realize the full potential of new shipping technology. Re-using segments of the riverfront for new kinds of development have become a certainty. The critical questions are: what parts of the river will open up, when, and in whose interest new development will occur.

The Mississippi River 13

The Mississippi River at New Orleans can be compared to a raised freeway

of water channelled above the city while the surroundings of New Orleans are water at its own level - the Pontchartrain Lake, lakes, marshes, and the canals. Having a width of 2,200 feet at Canal Street, the river has a bankside depth of from 30 to 60 feet and a mid-stream depth of from 100 to 180 feet. (See Map 2 and Figure 1) It is a great conveyor of commerce, of men and machines at work, of water and steel objects moving.

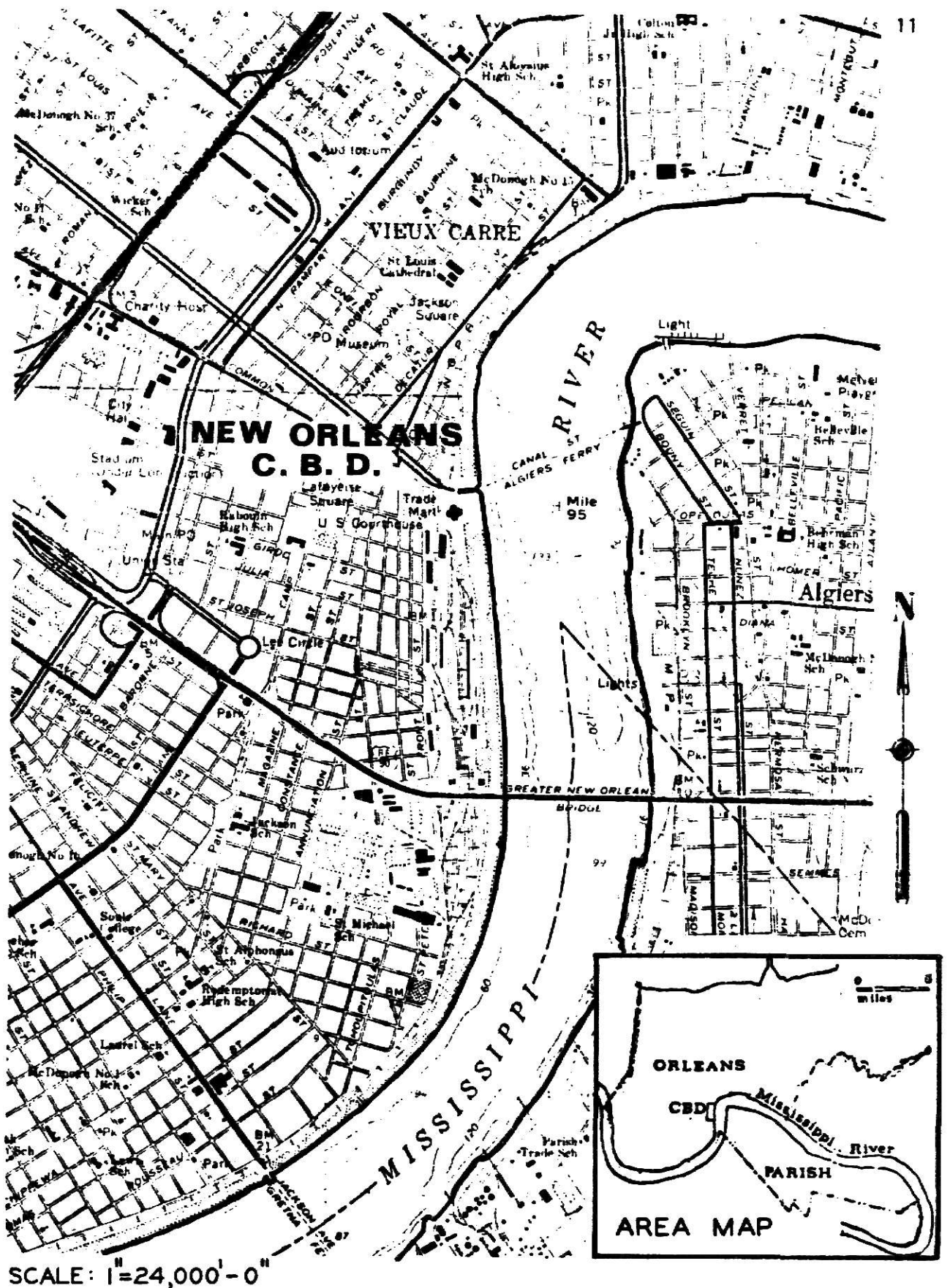
The problems of the Mississippi River which exist on New Orleans Riverfront are:

Water Level Higher than the City. Urbanization first occurred along the riverfront and bayous, areas of natural high ground. Levee construction, reinforcement and maintenance originated as a way to arbitrarily fix the river, which historically sought its own course, changing alignment not only during flood years but also through a combined cutting and building action; a constant scouring effect along the outside bends of the river and building up of silt on the inside bands. As urbanization pushed toward Lake Pontchartrain, which had an indefinite edge between marsh and land, additional levees were required to protect the developing areas from the lake and adjacent marsh. Lands were drained and dried, and as construction proceeded, they settled to elevations even lower than they had started out, in many cases below water level.

Now a system of levees surrounds the city, channelling the Mississippi River to the Gulf of Mexico and protecting the city from rising waters during gulf hurricanes.

Water Pollution. The city of New Orleans dumps about 125 million gallons per day of raw sewage into the river. Extensive filtration and purification is required to produce water of acceptable standards, and maintaining or improving water quality of the river is critical to supply all of the domestic and industrial water requirements of the metropolitan area.

Construction has begun on sewage treatment facilities that will provide



Map 2: U.S.G.S. Map of New Orleans, Louisiana

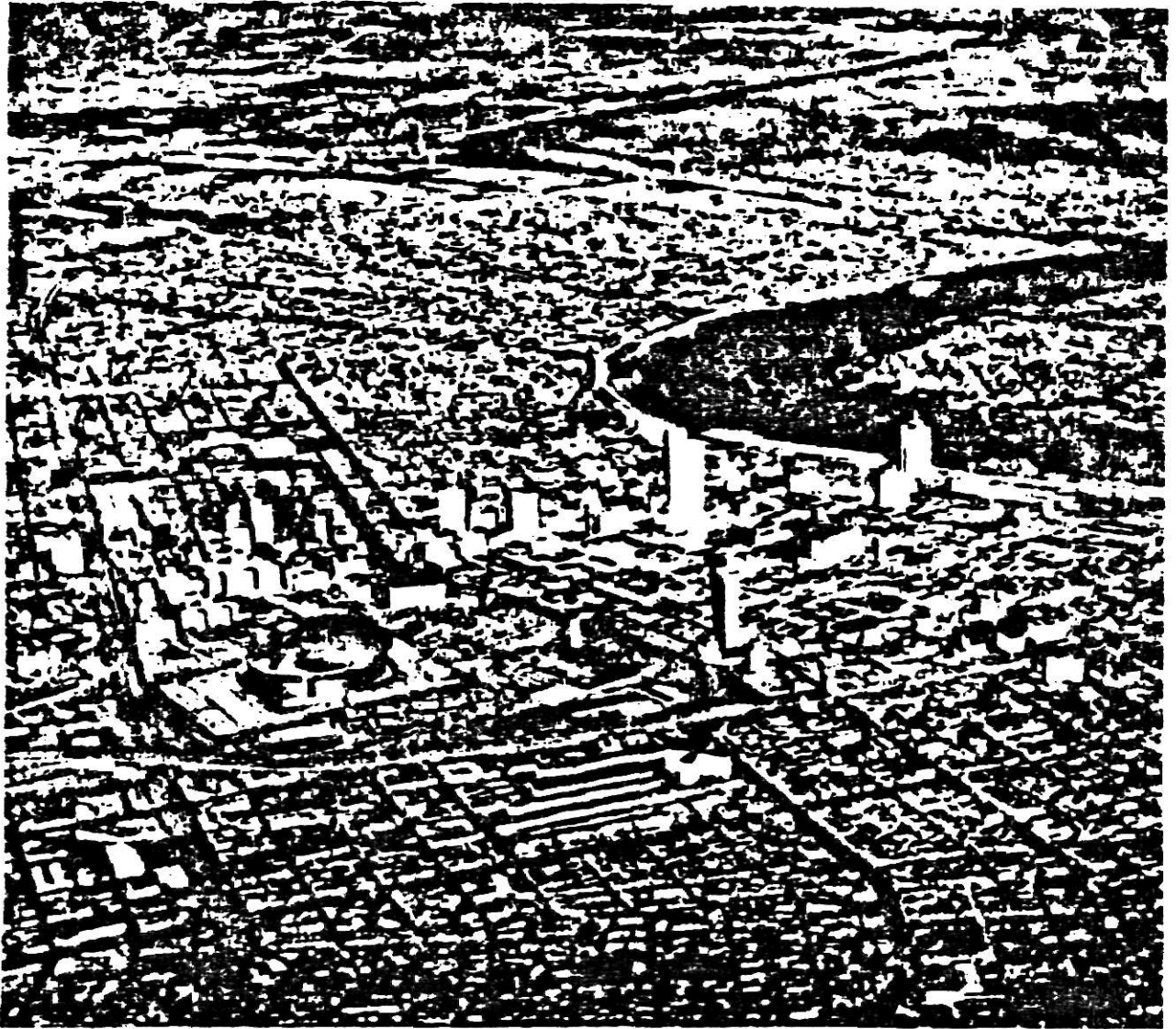


Figure 1: Aerial View of New Orleans
Urban Riverfront
(Source: 13)

primary and secondary treatment for the city's liquid wastes. Similar clean-up projects are underway in cities the length of the river so that human sewage will become less a factor in the river water pollution. Industrial and agricultural pollutants, toxic and inert chemicals, meanwhile, continue to pose a threat of increasing proportions to river water quality.

Visual Analysis

As is frequently observed, without a map one would never know that New Orleans is visually located on the Mississippi River.

The surface of the river is often above the level of the ground in the city of New Orleans: ships can be seen afloat above street level. A unique situation exists - one of the world's largest rivers snakes through a city, although unseen at ground level by most of the inhabitants of that city. The fundamental and inescapable reason for this visual separation is the fourteen-foot high levee. In the inner city riverfront areas, the visual barrier is greatly heightened by the almost continuous wall of wharves that spring from the levee height upward. In suburban areas, where residential structures march up to the base of the levee, the opportunity to build high enough to enjoy the view is scarce.

As part of Central Business District (C.B.D.) Pedestrian Plan (a 10 year, 500 million dollar multi-use development now underway, see Figure 2) a river promenade is planned to connect Spanish Plaza to the Moonwalk area. At the Moonwalk the promenade will merge with the city's recent improvements in the area. These pedestrian facilities are the Moonwalk (see Figure 3), the Washington Artillery Park (see Figure 4), the French Market Complex, and the Jackson Square Mall. All of these facilities are completed and are being enjoyed by thousands of pedestrians daily.¹⁴

Physical Factors Determining Riverfront Redevelopment

New Orleans is bordered by Lake Pontchartrain and the gulf marshes, and defined by the river. It suffers many of the ills of 20th century American

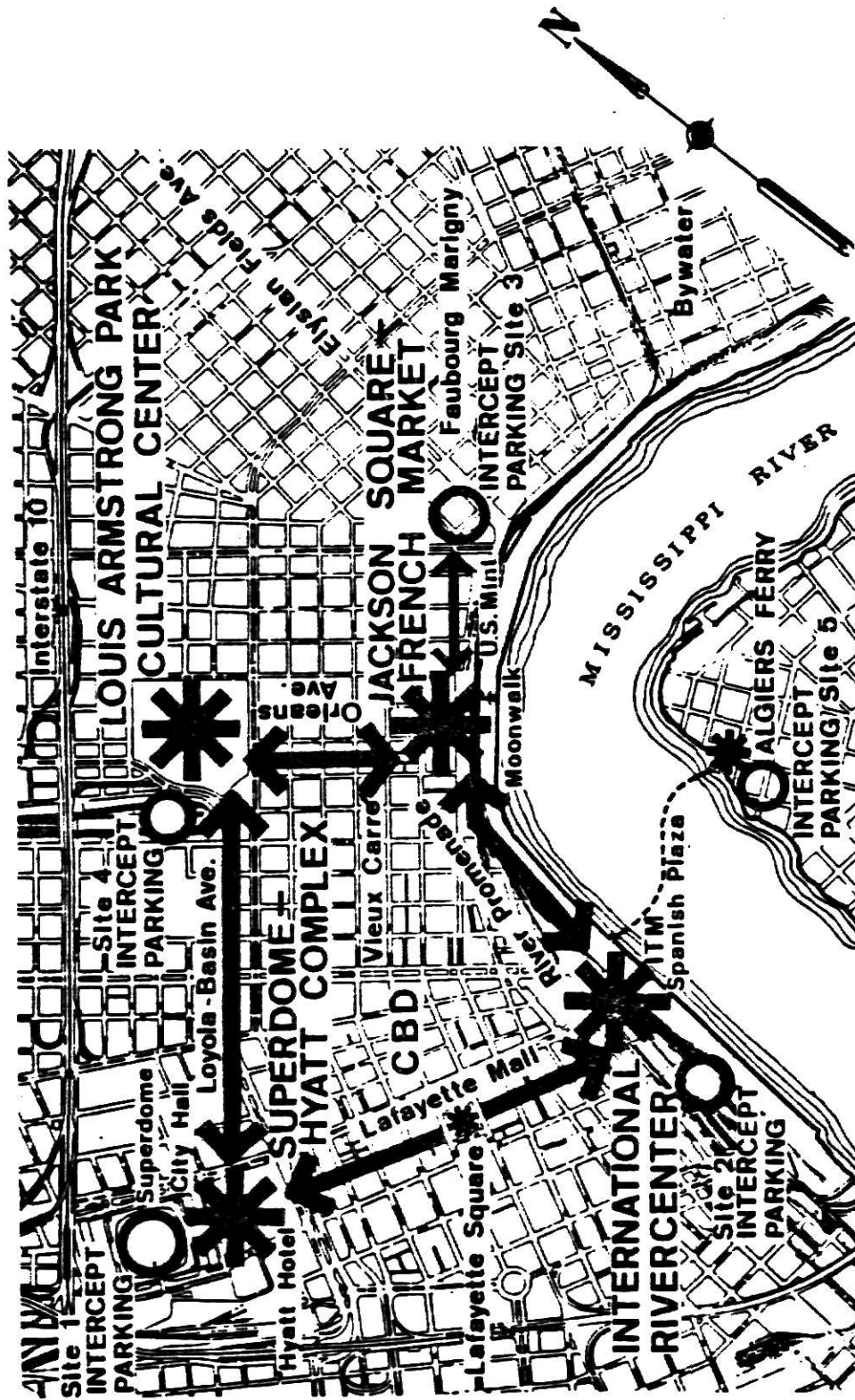


Figure 2: New Orleans C.B.D. Pedestrian Plan
(Source: 14)

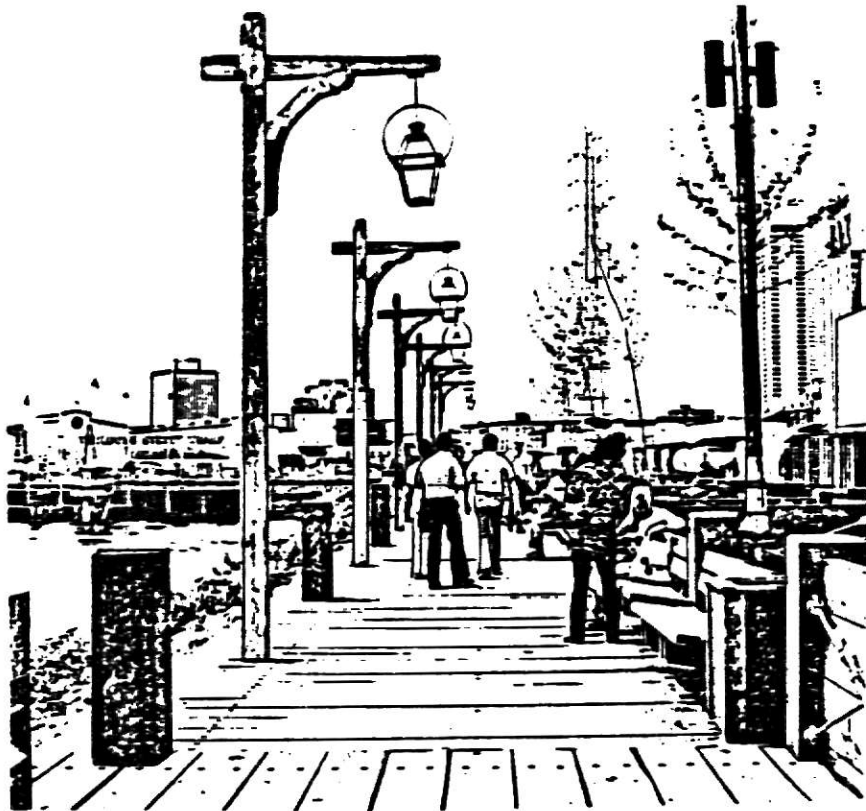


Figure 3: The Moonwalk, New Orleans

It is at the Mississippi River in front of Jackson Square. In the future it will connect to the Spanish Plaza and the New Canal Place Development. (Source: 14)

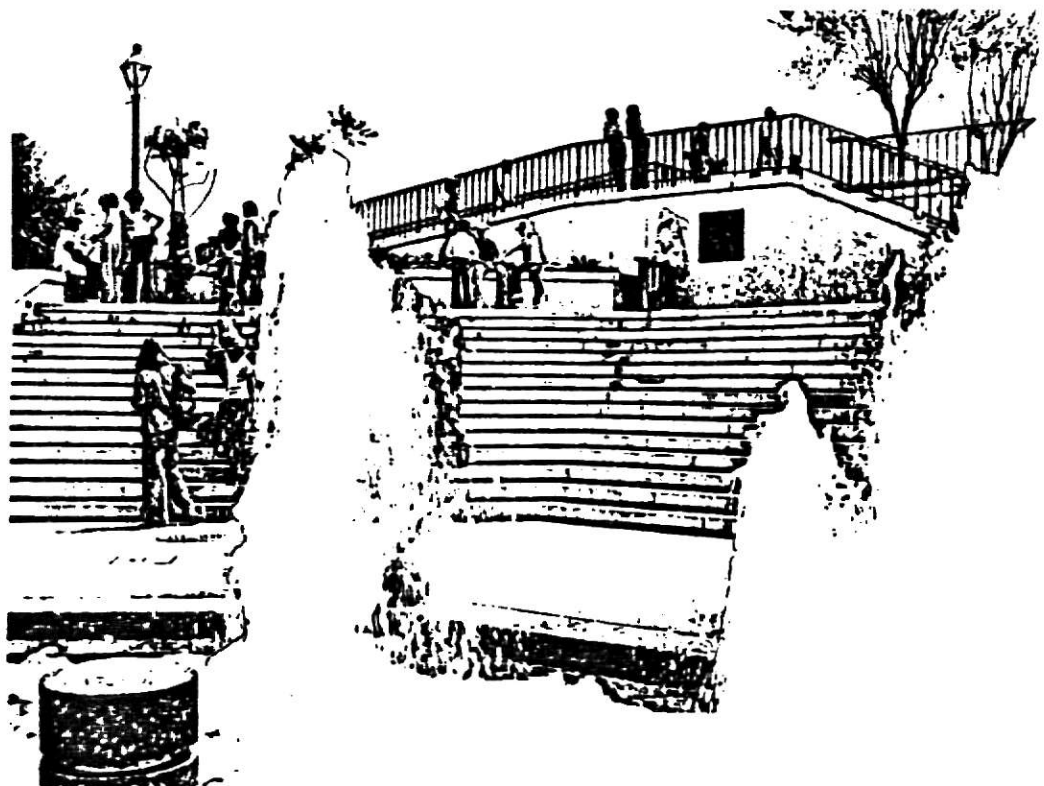


Figure 4: The Washington Artillery Park, New Orleans

This park is the pedestrian connection between the Moonwalk and Jackson Square. (Source: 14)

cities - pollution, overcrowded highways, inadequate housing, the tensions of people packed tightly together in man-made ugliness, and a special seediness that comes from the rotting wood and piles of brick and concrete in this climate.

Based on the Port of New Orleans Master Plan Year 1990, the majority of wharves along the Mississippi River will be retired.¹² This plan calls for moving the major elements of the Port away from the City to the Gulf Seaway which provides shorter and more direct access to the Gulf of Mexico. The move will be gradual, accomplished over the next 20 years and will, in effect, return the River to the City so that riverfront land may be used for residential, commercial and recreational purposes.

A Riverfront Expressway between the Vieux Carre and the riverfront would have imposed a formidable barrier had not citizen protest led to its defeat in 1971. Yet this land, where railroad tracks and warehouse once sprawled, is still up for grabs.¹⁵

From the description above, now we know, the opportunities to change that exist in C.B.D. are dramatic. Considerable vacant land or marginal land committed for redevelopment, stretches from Jackson Square to the Greater New Orleans Bridge. Wharves are becoming obsolete and being committed to new uses. Publically owned land along the River at major intersections or nodes offer excellent opportunities to coordinate transportation modes and establish contact points between people and the River.

Actions

Peripheral parking* is being planned as a vital part of the future transportation system of New Orleans. (See Figure 2)

* Peripheral parking is a concept in which the commuter drives his automobile to the periphery of the C.B.D. then either walks or rides a shuttle or local bus to his final destination.

The proposals for celebrating the unique river elevation conditions include: raising the land behind, bridging, establishing major pedestrian plazas above the river or even above wharf height simply providing clear and visual access over the levee, and symbolizing the river in the form of fountains or pools.

The proposals for overcoming the railroad barrier include: bridging or simply paving or grassing between and at the top level of the rail. With decent paving, traffic controls and landscaping, the rails are a far less formidable pedestrian, or even auto, barrier than most streets in town.

The proposals for cracking the wharf monolith include: opening up two or three bays of particular wharf structures as mini-parks or breaks overlooking shipping activity and the river. Small separated viewing platforms between various wharfs for public view of commercial port activity are sketched on Figure 5.

The major pending transportation decisions include the possibility of a new bridge*(see Figure 6) either at a location parallel to the Greater New Orleans Bridge or at Press Street; new ferry terminals at Jackson Avenue and Canal; parking facilities; the possibility of a mass-transit system** over the present bridge; (see Figure 7) mixes of transit use and systems to and within the C.B.D.; and, perhaps most important, the possible phasing out of certain existing port facilities and attendant rail connections.¹³

* A cable stayed pylon bridge is an appropriate structure for a new Mississippi Bridge. The box truss could support two separate roadways stacked vertically. It could save a substantial tonnage of steel compared to the existing cantilever bridge.

** The mass-transit system, utilizing outriggers on the existing bridge, if proven structurally feasible, or on a new bridge, could solve the east-west river crossing problem.

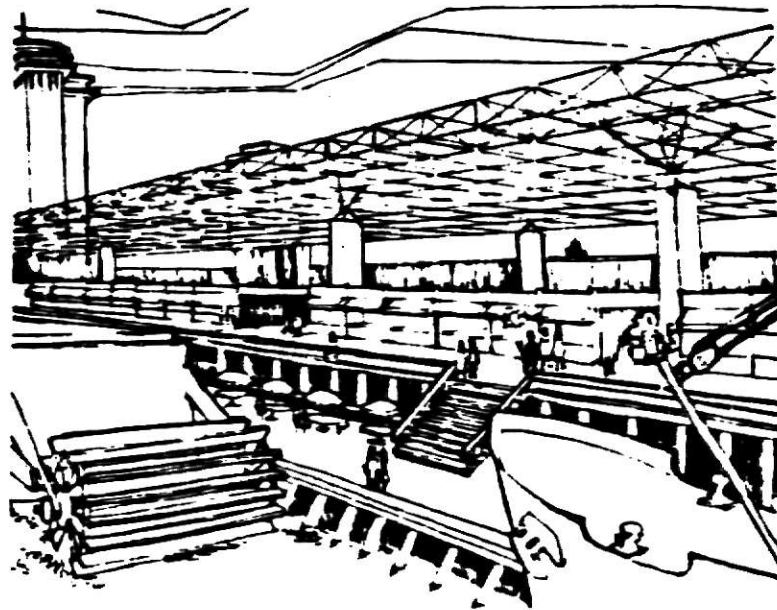


Figure 5: The Proposed Viewing Platform, New Orleans (Source: 13)

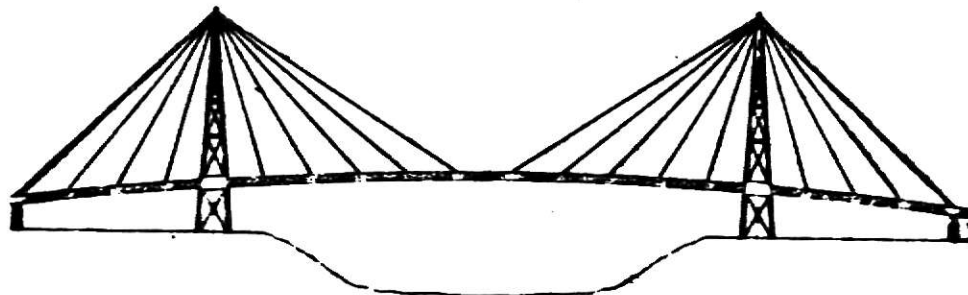


Figure 6: The Proposed Pylon Bridge, New Orleans (Source: 13)

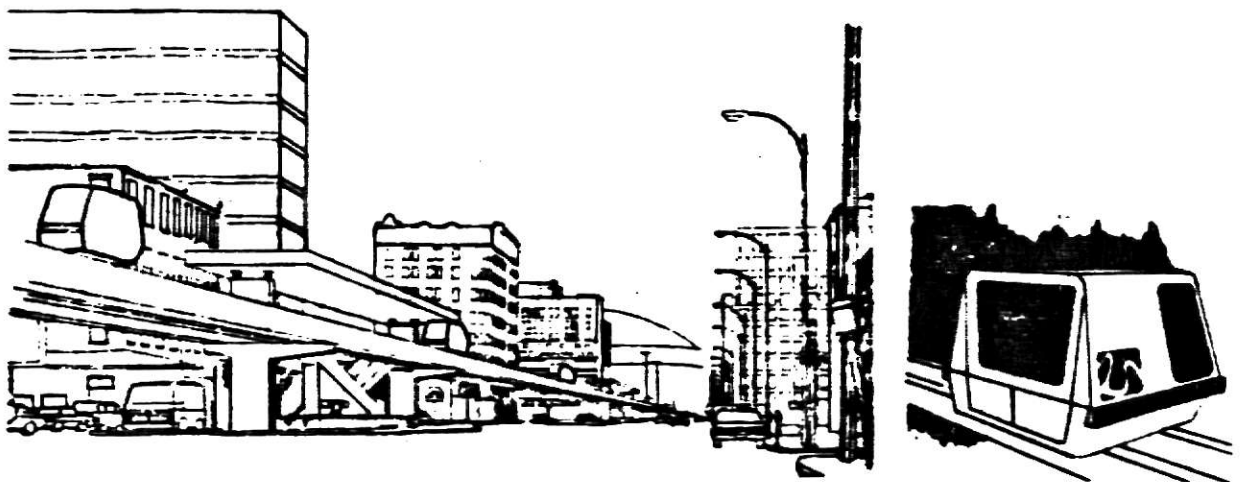


Figure 7: The Personalized Rapid Transit System, New Orleans (Source: 13)

Management and Government Function

Zoning, administered by the City Planning Department, is a powerful tool for implementing public policy, cutting across areas of land-use, land-value, private sector investment activity, urban design quality, scale, and even market, to a certain extent. Taxing policies, an area that the City has already been moving on, is also a tool that impacts the shape of development. In relation to the city government, the Growth Management Program study addresses questions of public policy and proposes an organizational form and program that would try to give direction to and synthesize the real estate interests and city goals. Other City agencies that are directly involved in various aspects of riverfront development decision-making, in addition to those mentioned above, are the Mayor's office, the Streets Department, and the Vieux Carre Commission.¹³

SAN ANTONIO URBAN RIVERFRONT REGION, TEXAS

Cultural and Historical Development

San Antonio, the third largest city in Texas, the seat of Bexar County, is situated on the nonnavigable San Antonio River, about 190 miles (304 km) west of Houston. (See Map 3)

The San Antonio River, once spring-fed and clear, was the site of the earliest settlement of San Antonio by the Franciscans, in 1718. From then on, the Spanish and Mexican influence has been significant in San Antonio and along the river. Growth of the city took place independent of topographic influences. Much of the city's history is recorded in the development of the San Antonio River. It appears that much of its future will also be.

San Antonio, the tenth largest city in the United States, is a major manufacturing city and the banking, transportation, and retail trade center of south-central Texas. Today, the city displays a variety of the old and new, a modern and progressive city with the charm of the Spanish-Mexican influences

that helped to shape its character.¹⁶ Few cities have so rich a heritage.

The site of the San Antonio River Walk is a horseshoe bend on the San Antonio River covering an area about four by six blocks in size in the Central Business District. Figure 8 is a map of the River Walk area and its relation to other downtown attractions. In 1921, the downtown area was heavily flooded by the river. This created a great deal of public support for channelizing the stream and eliminating the horseshoe bend in the downtown area.

Some dissatisfaction was expressed with the concept of covering the stream with concrete and making a street above, with the bed serving as a sewer in the downtown area. In 1924, the San Antonio Conservation Society was born as a result of interest in saving the horseshoe bend. A flood control project was completed in 1929 leaving the horseshoe bend with a stabilized water level. During the next several years local citizens contemplated the design possibilities presented by the stabilized river channel.

In 1938, the Works Progress Administration became interested in the horseshoe bend and agreed to provide funds for the design and construction of beautification of this area. The work consisted primarily of bridges, rock retaining walls, walks, and landscaping. Even today, this work represents a conspicuous portion of the River Walk.

Little was done for the next 20 years and the River Walk developed a bad local reputation as an environment for crime. In the late 1950's, several local citizens discussed the idea of restoring the appeal of the river. Improved law enforcement and additional attractions were greatly needed by the area; only one restaurant was actually oriented to the river. A Disneyland scheme was proposed by a consulting firm but this did not totally please the persons who requested the study. The proposal did stimulate new interest in the project.

The city council passed an ordinance in 1962 creating a River Walk Commission. This commission was empowered to act on all building permits within the River Walk area and to advise city council on matters pertaining to improve-



Map 3: U.S.G.S. Map of San Antonio, Texas

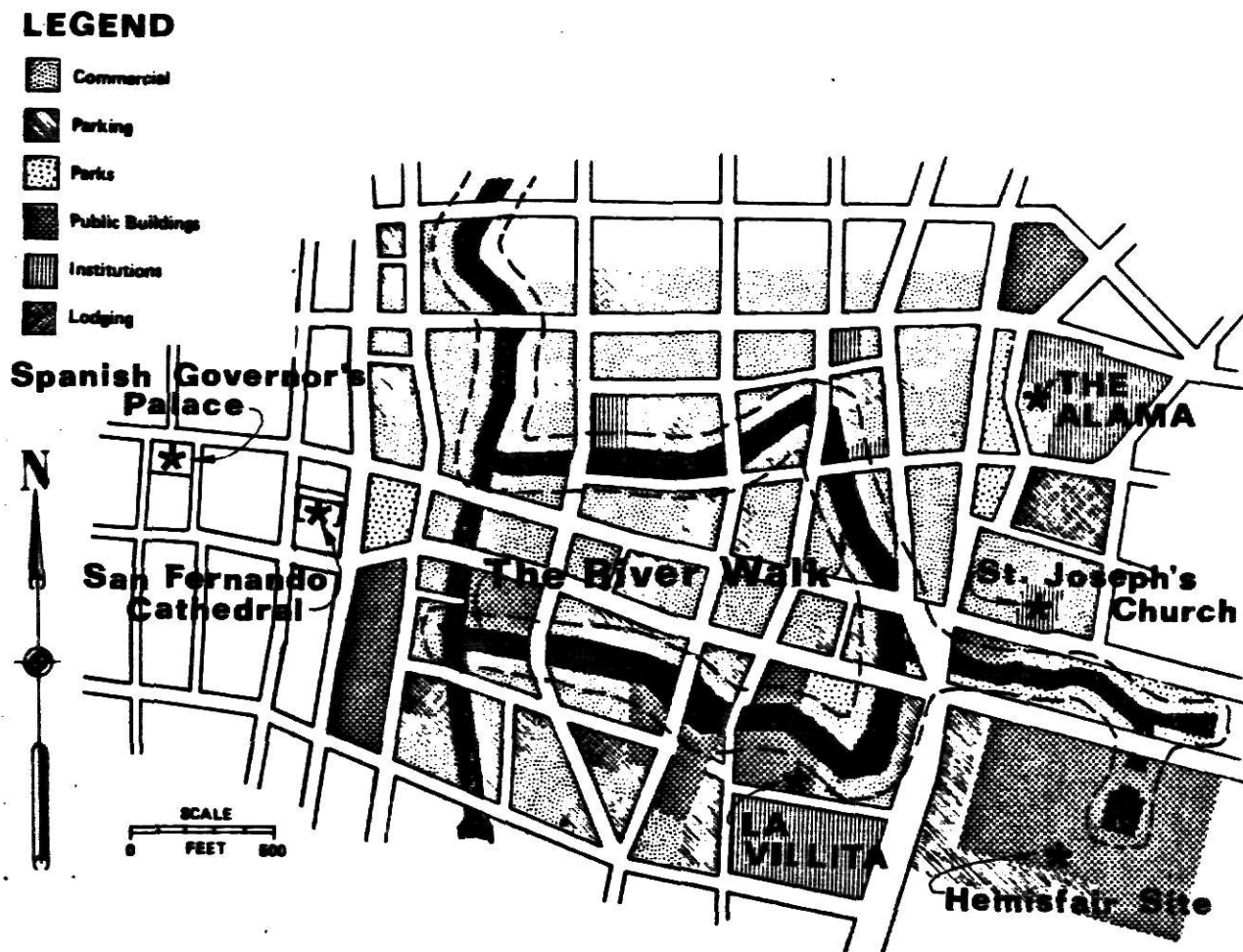


Figure 8: The River Walk Area, San Antonio
(Source: 20)

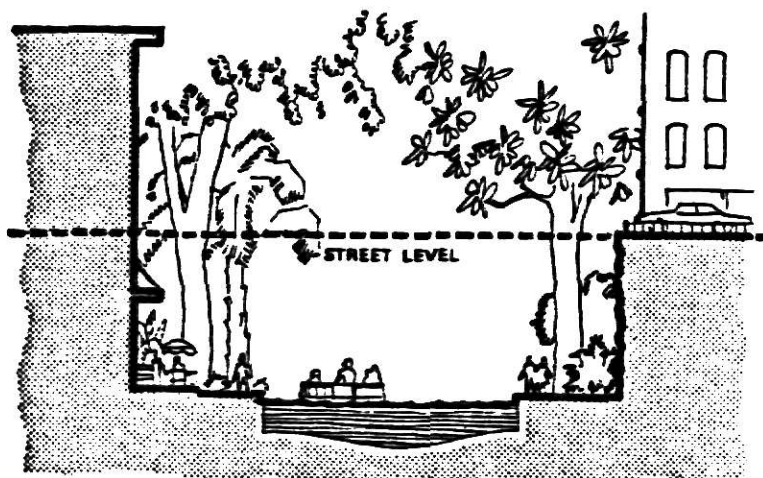


Figure 9: Section Through the River Walk, San Antonio
(Source: 20)

ments on the River Walk. In 1964, River Walk improvements were passed in a bond election and owners of reiverfront property began to remodel and rehabilitate properties for commercial use.¹⁷

The background of the River Walk and of the city of San Antonio, as well, are instrumental in providing an interesting setting to attract visitors to San Antonio.

The Problems of the San Antonio River

The San Antonio River laces through the center of San Antonio, Texas, providing a green corridor through the city. A priceless environmental asset, this spring-fed stream comes to life in the northern part of the city, winds its way through the downtown, proceeds south by the old Spanish missions, then leaves the city to continue its journey to the Gulf of Mexico.

The river bottom is 25 to 30 feet below street level. (See Figure 9) It is navigable by flat-bottomed barges and pedal boats. Some other facts about the San Antonio River are: it is a first-order stream whose source is precipitation and springs; it is subject to erratic flow due to the variable and erratic nature of precipitation in the region; and it is used for waste disposal. We can say it is probably the best known, most uniquely developed, small river in the United States.¹⁸

The Problem of too Much Water.¹⁹ San Antonio's history of flooding is, of course, familiar enough, and indeed some degree of high water damage occurs about every 18 months. But it has been more than thirty years since the last major flood in San Antonio (1946), and in that time extensive development has taken place in the River Corridor -- on the Paseo, most activity since 1966-68. Many people assume that existing flood control works are adequate to avert disaster -- Olmos Dam at the headwaters, early cut-offs and channelization, and recent work below Johnson Street. But this is far from true. Four of the five and one-half miles of River through the urban core -- the River Corridor -- are vulnerable to

the kind of devastating flood that has ravaged 80-90% of the Corridor twice since 1900.

The Problem of Too Little Water. Increasing urban and agricultural development within the region is already placing a greater demand on the River's sources than nature can restore. River flows are generally maintained by pumping from wells at the site of the springs which originally fed the river. The huge springs of San Marcos and New Braunfels in the north are projected to cease in less than 30 years. And for over 35 years, an average deficit of 75,000 acre-ft has occurred. The absolute deficit will increase -- except in years when major floods occur. Unless planned for now, this discharge deficit could mean the river would have to be shut off in order to meet the water needs of the region's population. It will certainly mean a very restricted flow.

The Water Quality Problem of Too Poor. In any case, the lower the flow in the stream, the less the River is able to purge itself of man's contaminants. Excessive drawdown on the aquifer may bring intrusion of saline waters as internal pressure is reduced. Even now, the River emerges in upper Brackenridge Park clear and sparkling from the limestone caverns of the Edwards Aquifer, but is so quickly degraded by urban effluents, that by the time it reaches the Paseo, is already murky, unsafe for swimming, and incapable of supporting edible fish. Without controls of discharge into its stream and mechanisms for purifying and aerating its water, the low flow river of the future would be a stinking ditch.

As a problem, then, the River poses much more than a single challenge. It is a three-sided question of water management: the occasional threat of too much water, the steadily increasing threat of too little water, and the present fact of poor water conditions are all closely interconnected. The circle is closed when it is considered that the best programs of water management, providing adequate solutions to the three-sided question mentioned above, will at the same time open the river corridor to unsuspected opportunities for develop-

ment -- new areas of open space, a greatly expanded river walk, many kinds of recreation, river-oriented residential and commercial clusters.

Flood Control¹⁹

The problem of flood control is one that has not been totally resolved. Although a certain protective steps have been taken, there is still much work to be done.

Early efforts at controlling the San Antonio's flooding focused on scattered critical areas. These included Olmos Dam and Reservoir (1926) which impounds the runoff from the headwaters basin of Olmos Creek, and contemporary straightening which removed some eight miles of river length, most of it below the corridor.

Since the mid-1950's, the Army Corps of Engineers has been pursuing a work program for providing flood control for the corridor which has proceeded in a systematic way from south to north.* It will continue to do so until the project is completed. Construction was delayed by lack of funds. In 1960, the local funds were exhausted when the work reached Johnson Street, about one mile south of the Paseo. River condition in 1973 can be seen in Figure 10. The preferred flood control alternatives are shown on Figure 11.

The whole process and efforts that lie ahead are quite costly because the river runs through the heart of the city. Flood control measures have to be devised that will protect the community without destroying either the buildings or the natural beauty of the river corridor. Undoubtedly, it is a lengthy, expensive, and controversial undertaking.

* Both the volume and velocity of the river rapidly increases as the stream moves south from its source. If flood features were built from the north downstream, interim flood waters would back up from the much larger lower flow, and the upstream floodworks would be useless. Thus, the flood control began at the southern end.

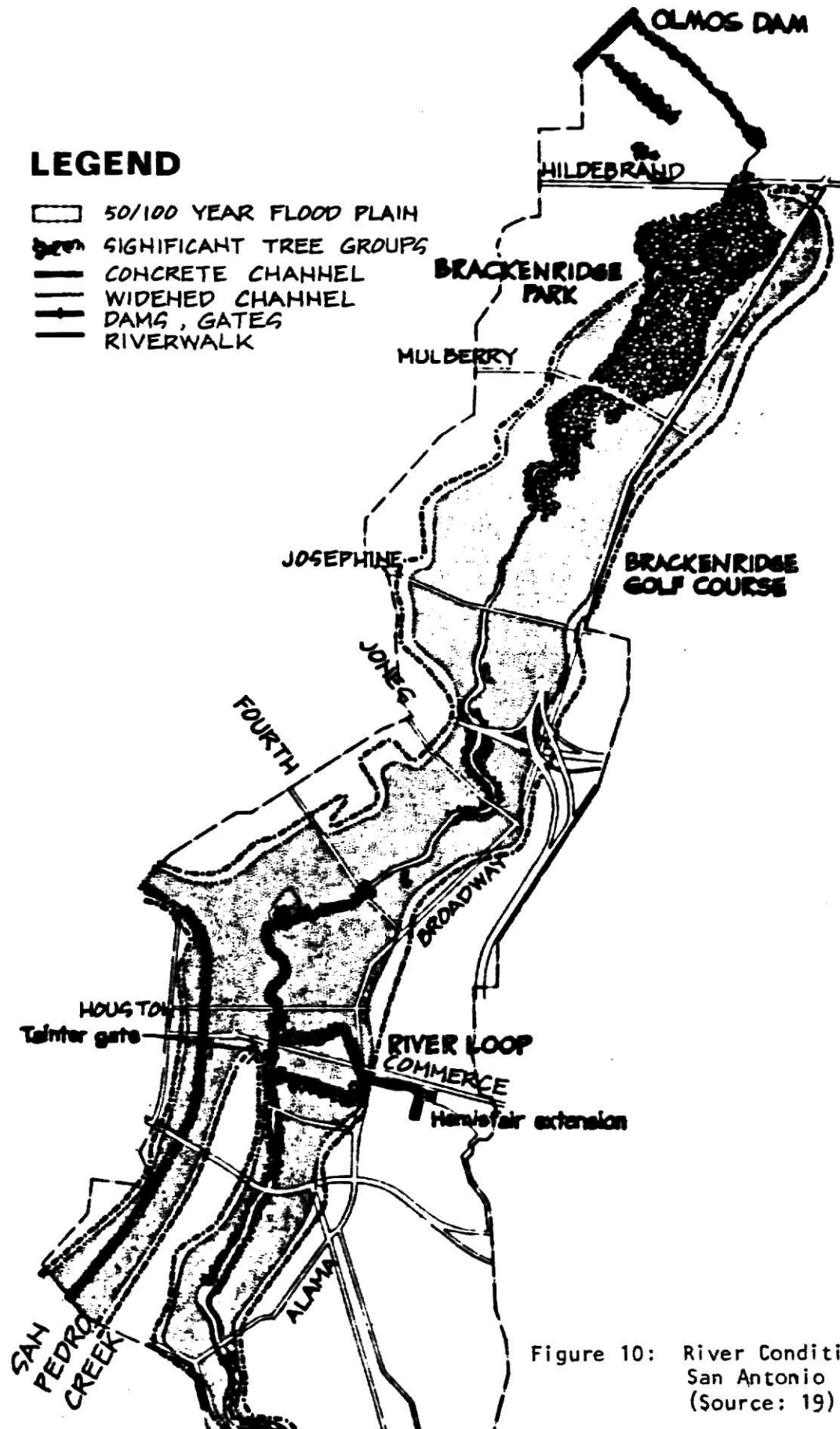


Figure 10: River Condition in 1973,
San Antonio
(Source: 19)

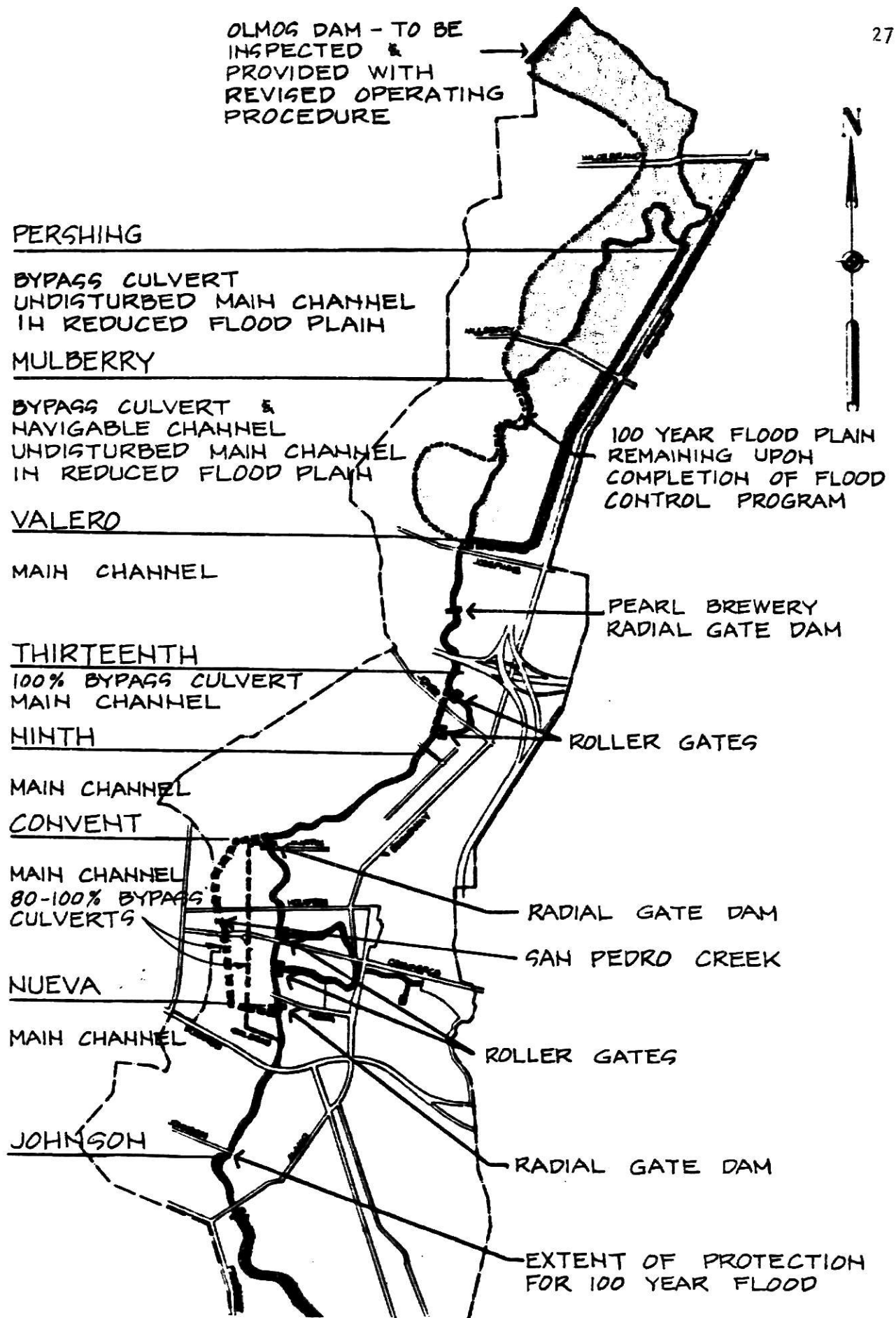


Figure 11: The Proposed Flood Control System, San Antonio (Source:19)

Flood control is a basic problem which must be solved if corridor revitalization is to occur. The San Antonio River Authority and the United States Corps of Engineers are working together now to accomplish flood control of the San Antonio River so the river will be both safe and beautiful.

Quantity Control¹⁹

It is recommended that radial-gated dams be constructed at Lone Star Brewery, near Convent Street, Nueva Street, and Pearl Brewery. Although the primary purpose of this system of dams is to maintain the river channel depth during periods of low flow and provide lakes within which water can be recycled and aerated, they will also make an important contribution to flood control.

Even with an extensive bypass system, the main channel of the river will carry a maximum flow after major storms. During flooding, the gates of the dams will be drawn up under the hood of the dam, allowing water to escape downstream from both the bottom and across the top of the dam -- a release system that will reduce velocity and turbidity, minimizing damage to the channel walls. (See Figure 12)

During a period of water scarcity, when the river's normal flow will have to be restricted or, eventually, shut-off to protect the domestic supply, the function of the four dams will be to retain the available water volume and maintain the river at navigable depth. They will create linear lakes renewed by a varying current depending on availability, or in the ultimate scarcity, still-water ponds.

As transfer points for water taxis and other modes of intra-corridor shuttle service, the dams will become focal centers of activity and commercial development. At normal flow, walkways along their crests could provide festive cross-river bridges with stairways to river walk or bank level.

Quality Control¹⁹

All sanitary sewage from the metropolitan area is piped south and enters

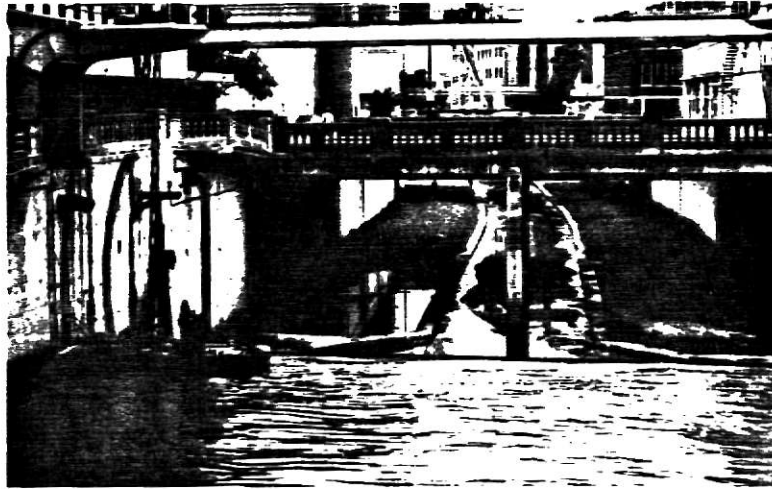


Figure 12: Water Stability Achieved by Dam, San Antonio
(Source: 17)

the river below the corridor. The quality of water within the corridor is poor and, due to increasing urbanization and the above noted diminished flow in the future, will progressively deteriorate unless specific measures are taken.

Without any change in the present configuration of the river corridor, several kinds of action would be necessary to restore the quality of the water to visual acceptability and recreational standards:

1. A system of storm drains whereby the initial runn-off can be delivered to sewage treatment plants for removal of toxic and oxygen-consuming contaminants (same as the aeration system).
2. Periodic dredging of silted basins.
3. More effective enforcement of anti-pollution ordinances made possible by the present survey of discharge pipes within the corridor.
4. A campaign of public education to reduce debris pollution.
5. Prohibition of the use of outboard motors within the corridor.

The sluggishly flowing or still-water "lakes" of the modified river will require:

1. A filtration system to renew what will be stagnant or near-stagnant water.
2. A recycling system for water conservation, whereby each segment of river is returned to its northernmost elevation after filtration, or the entire corridor reach of the river is so returned in a single pumping operation.

Visual Analysis of the River Walk

Because of the depression of the river below ground level, a micro-climate is created that remains a bit warmer in winter and cooler in summer than the streets above. This allows the plant-life along the river to flourish. A continuous promenade parallels the river on both sides and the fifty-foot river is bridged many times providing both automobile and pedestrian crossing.

(See Figure 13). Buildings facing the river are being renovated and improved architecturally to conform with standards established to increase the aesthetic appeal of the River Walk.

Following are eight primary characteristics of the River Walk:

1. It is physically far more than a paved promenade although this is a major functional segment. It is a special zone along a horseshoe bend of the San Antonio River that relates to many other attractions and functional elements of San Antonio, Texas.
2. It has emerged as an aesthetically unified area due to the integration of engineering, architectural and landscape design. However, the evolution is not complete because a few misfits of design still remain.
3. Access has developed in a rather special way allowing easy and frequent physical linkage with the downtown area and yet retaining a quality of hidden mystique. Identification and information are provided by a specially integrated sign system.
4. A rare blend of historic and contemporary life has been created.
5. A great diversity of interest and user activity by many kind users is evident.
6. Because the water is the focus of development, its quality becomes important.
7. It was found that much of the success of the River Walk was due to the special system of maintenance and control.
8. The River Walk contains both environmental cohesiveness and diversity.

Physical Redevelopment 19

The San Antonio River has provided an existing urban design opportunity. In the downtown river bend area, efforts have been made to pull the various elements -- buildings, street furnishings, planting, bridges, lighting, etc. -- into

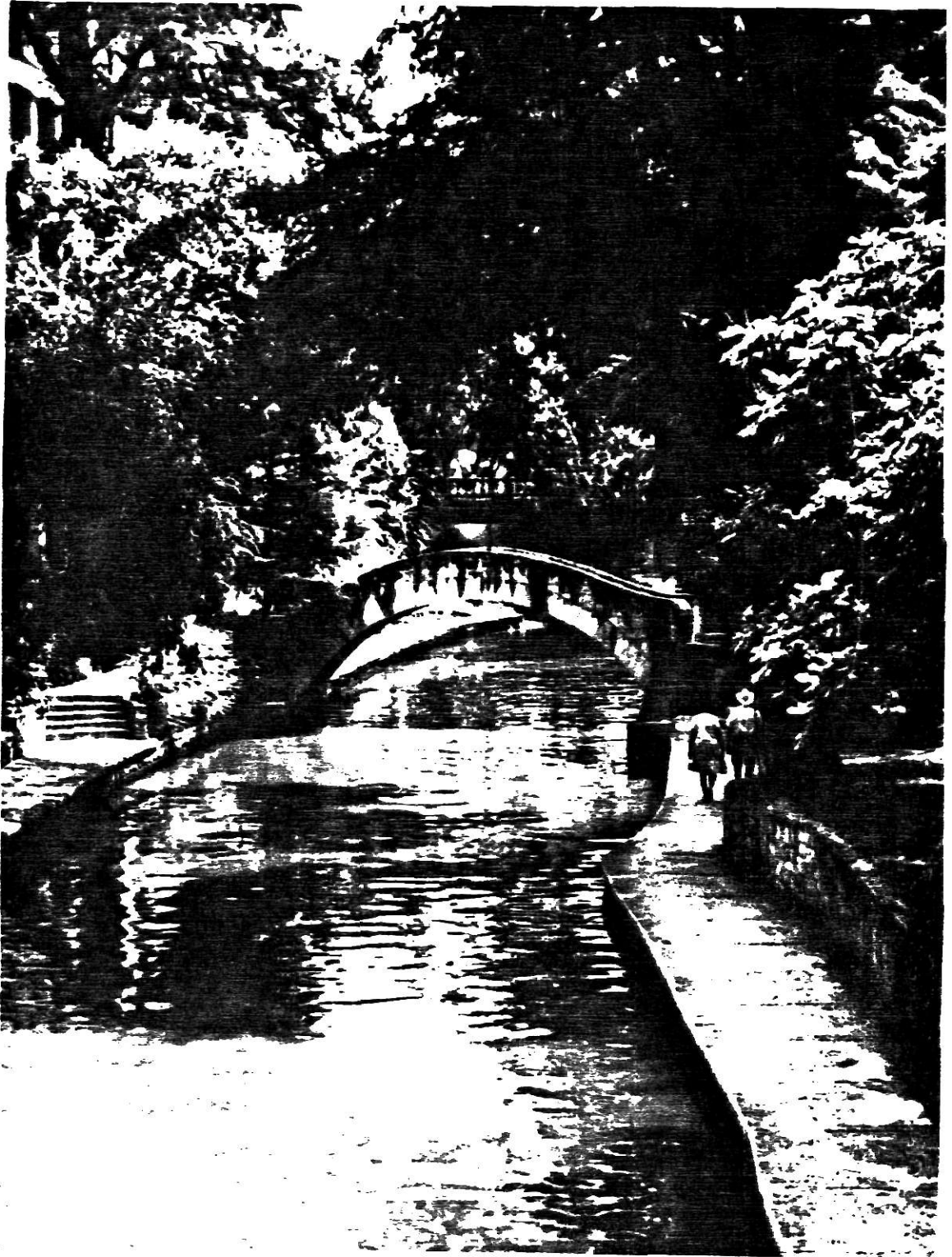


Figure 13: Typical View of the San Antonio River Walk
(Source: 20)

a pleasing and interrelated whole.

There are 3.51 miles of pedestrian walks lining the banks of the river in the heart of the city. It is possible to traverse the entire downtown area at river level, never confronting the street with its noise, congestion, and disheartening visual confusion. The pedestrian can step from the street to the depressed river level and be in a world of trees, birds, plants, flowers, music, and charm.

On the other hand, Santonio's downtown is presently experiencing a degenerative cycle that appears to be accelerating. A substantial portion of buildings are deteriorated to a point of being unsightly and obsolete in terms of present-day functions and life styles. Development without architectural and sign control have produced a conglomerate of poor urban design lacking any sense of grace or compatibility with neighboring buildings. Dispersal of different uses (retail, office, wholesale ...etc.) is scattered, resulting in the loss of the mutually supportive economics of clustering and increase in traffic congestion.

Circulation within downtown has been less than optimal for a long time, with consequent high congestion, pollution, and noise. Except for magnificent assets like the River Walk, La Villita, and Alamo Plaza, San Antonio's downtown is deficient in the amenities that give a sense of quality to the urban environment. The traffic density, with its countless vehicle/pedestrian conflicts and noise, produce an air of tension and harrassment which heightens a general sense of personal insecurity. People do not feel at ease in the downtown area.

Together, these liabilities have led to the region's inhabitants to avoid downtown, to prefer suburban sites where there is less hassle. It was this impulse that began the decline of the downtown. Yet there remain residual assets on which a program of physical revitalization can be based. The challenge is to better integrate the below-ground-level river environment with the street-level city environment. If the street level environment could be connected with

the river and if it could achieve the same design standard as the river level environment, San Antonio's environmental quality would be greatly enhanced.

Actions¹⁹

A physical revitalization of downtown -- not by expanding the area but by redesign and upgrading of all aspects of use within the existing downtown area. Even though the River Walk is highly successful in revitalizing the downtown core and is the object of great pride and use, improved linkage with ancillary attractions, clearer identification of landings and schedules of sightseeing barges, better water quality, more restroom facilities, more consistent lighting at some sites, and a better understanding of the security and safety level already attained are issues worthy of further effort.²⁰ Also, an economic revitalization, through a planned progression of economic expansion, has been designed to inspire private investment within this refurbished core-city environment to produce a more intensive level of retail, office and visitor activity, as well as clusters of riverside apartments. (See Figure 14)

Management and Government Function ²¹

The City Parks Department performs an admirable service of maintenance so the pedestrian paths are always well-tended and attractive. The security of the River Walk is well-established. Good lighting illuminates the area without being obtrusive and ugly. Park Rangers patrol by boat and on foot, providing a friendly security and information presence. Another significant security factor is that people use the river. The presence of active users does much to discourage crime and violence.

The entire history of River Walk in San Antonio as well as the general river-improvement program, are an aggregate of participation by government on several levels. The skillful use of funds and organizational authority to accomplish the present level of development was essential, and such use is continuing in the further expansion and development of River Walk.

LEGEND

1. FLOOD CONTROL
2. OPEN SPACE / RECREATION
3. ACCESS
4. C.B.D. RETAIL
5. C.B.D. OFFICE
6. VISITOR SERVICES
7. INTERNAL CIRCULATION
8. HOUSING

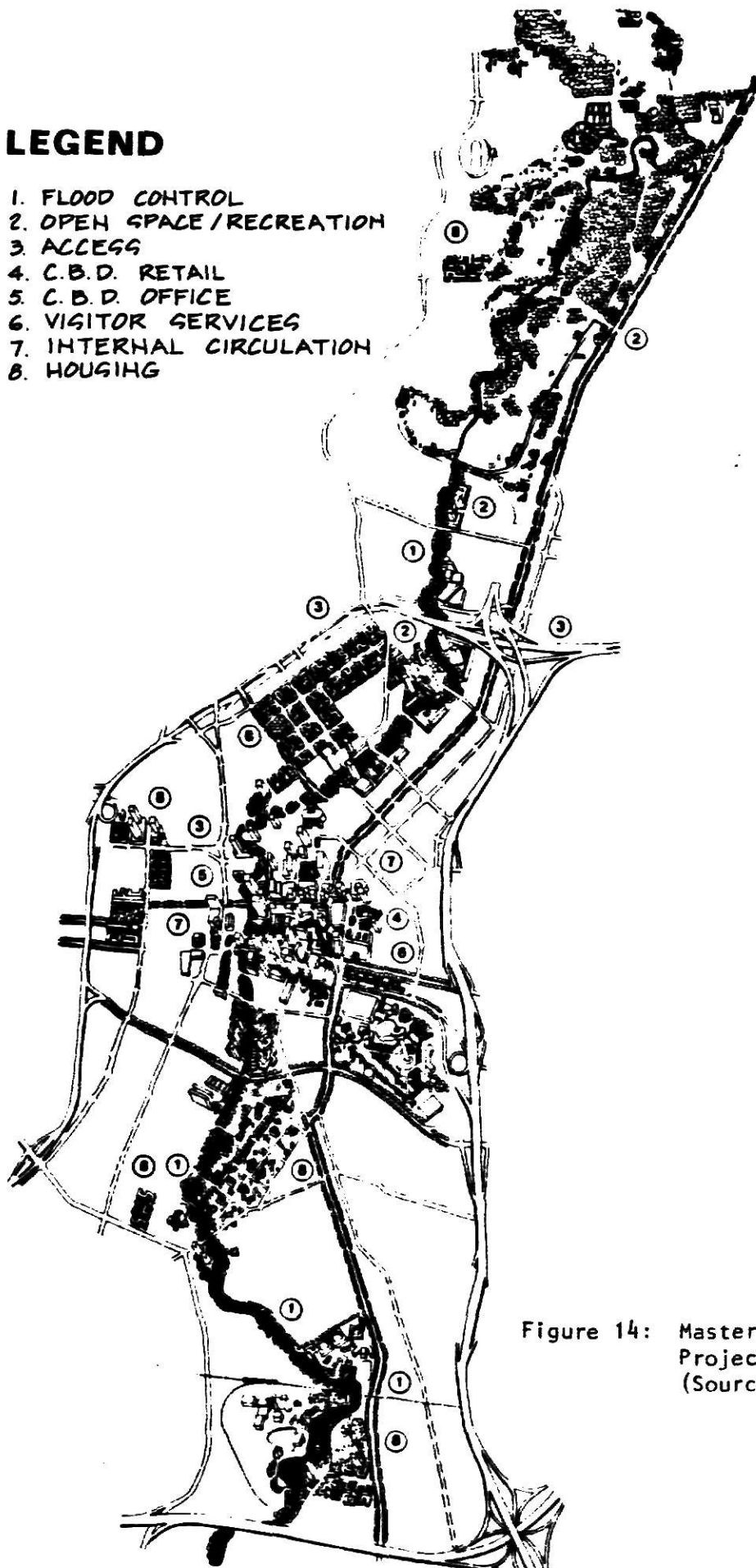


Figure 14: Master Plan of Proposed Projects, San Antonio
(Source: 19)

Local government in San Antonio has been a factor in river improvement since the original flood control measures taken back in the 1920's. One of the most significant actions of local government was the passing of the River Walk Commission ordinance, in the early 1960's. Through this legislation, the city government has provided a mechanism for guiding and controlling development along the river in a way which had been deemed desirable for the entire city.

Participation in San Antonio River improvements at the State Level is represented mostly by the San Antonio River Authority, chartered under State Law. The Authority, with jurisdiction over the entire river basin, often acts on behalf of local interests in arranging Federal participation in water resources projects.

Federal participation in the improvement of the San Antonio River was prominent during Works Progress Administration construction in the 1930's. During the 1950's, the Corps of Engineers flood control project came into being. With urban renewal funds, as with flood control and WPA funds previously obtained, development and improvement of the San Antonio River are being continued to provide a real economic and aesthetic asset to the city.

To date, the River Walk is a mix of business, park, entertainment, shopping, and conference facilities. It shows a dynamic phenomena that speaks highly of the level of cooperation achieved between government, private organization and commercial enterprise.

WICHITA URBAN RIVERFRONT REGION, KANSAS

Historical Development

With a population of over 250,000, Wichita has grown from a famous cowtown to the largest city in Kansas. At the confluence of the Arkansas and Little Arkansas rivers, (See Map 4) the downtown area is entering an age of renaissance. The arts, cultural programs, architecture, leisure time activities, parks and fountains are intermingled with the business activity of a



Map 4: U.S.G.S. Map of Wichita, Kansas

metropolitan center.

Boasting the cleanest air among the nation's largest cities, Wichitans are dedicated to maintaining this image. Over the last five years, the city has been able to attract twenty-five new "clean" industries and plants -- such as National Cash Register and Metropolitan Life Insurance Company.

Wichita remains the "Air Capitol of the World" producing over sixty-five percent of the world's business and private aircraft.

In addition to serving as a major retail and distribution center, as well as the largest manufacturing center in Kansas, Wichita is also a major transportation center. Five major railroads provide service to all major interstate, state and county systems. Air transportation is centered at Wichita's Mid-Continent Airport which has recently been named a Port of Entry, achieving international status.

The business core area of the city is a tribute to major redevelopment efforts radiating from a multi-million dollar civic center; Century II. Additionally, a new public library, city administration building, major bank and office buildings are enhanced by wide parkways, green areas and a redevelopment of the core riverfront. ²²

The city of Wichita has expressed interest in the Arkansas River from both flood-control and leisure-use points of view for many years. Early in Wichita's development, business flanked the main streets on both sides of the Arkansas River. The continued growth of downtown forced greater awareness of the needs for some kind of flood control plan so the central business district would be a less high-risk area. Flood waters are now rerouted through a drainage channel around the city. More than fifty parks in the city provide active and passive recreation. Area lakes together with the Arkansas River provide fishing, swimming, boating, or quiet riverfronts for relaxation.

Far-sighted planning, as early as 1923, succeeded in preventing industrial development from monopolizing the majority of the riverfront. The major

rail systems does not follow the waterways nor penetrate the central business district.

Currently, there does appear to be a "river ethic" concerned with re-orientation to this asset. Efforts, however, continue to be fragmented resulting in spotty development. Recently, two river parks have been built near the convention center (Century II), providing some linkage between downtown and the river.¹⁷

The Problems of the Arkansas River

Arkansas River is situated in the west central and south central United States, rising in Lake County, Colorado, and emptying into the Mississippi River in Desha County, Arkansas. It is 1,450 miles (2,333 Km) long. From its source in the Rocky Mountains of Central Colorado, the Arkansas River flows south, then east across Colorado and Kansas to the vicinity of Wichita. From there it runs southeast across northeastern Oklahoma and central Arkansas, passing Tulsa, Oklahoma, and Fort Smith and Little Rock, Arkansas.

The Arkansas River, one of the major western tributaries of the Mississippi River, drains an area of approximately 160,000 square miles (414,400 sq. km). Numerous water-storage, flood-control, and hydroelectric units have been developed in its basin.²³

The Problems of Too Much and Too Little Water. Brief flooding occasionally results from very heavy thunderstorm rainfall; but, with the completion of the Wichita-Valley Center Flood Control Project Works, in 1959, Wichita is now protected against floods from the Arkansas River, Little Arkansas River, Cowskin Creek, Chisholm Creeks, and the Big Slough. This project, a series of floodways and diversion canals, was designed to protect against floods up to the 75-100 year frequency class. No flooding from major streams has occurred since October, 1955. This solved flood control problems but still left unanswered the problem of no water in the summer and fall -- a critical factor

if riverfront development was to occur.

In 1961, a Center City Study was completed and expressed the need for new community facilities. Urban renewal became a reality after this study was completed and focused on a blighted area adjacent to the river.

Urban renewal proceeded with no real orientation to the river. However, pressure was building rapidly to develop a reservoir in the river channel to retain water year-round. While navigation is possible, the lack of provision for locks in new reservoir development suggests that navigation is not to be a major use. On the Arkansas River, where it is joined by the Little Arkansas River and not far from the central business district, power boating and water skiing are popular.

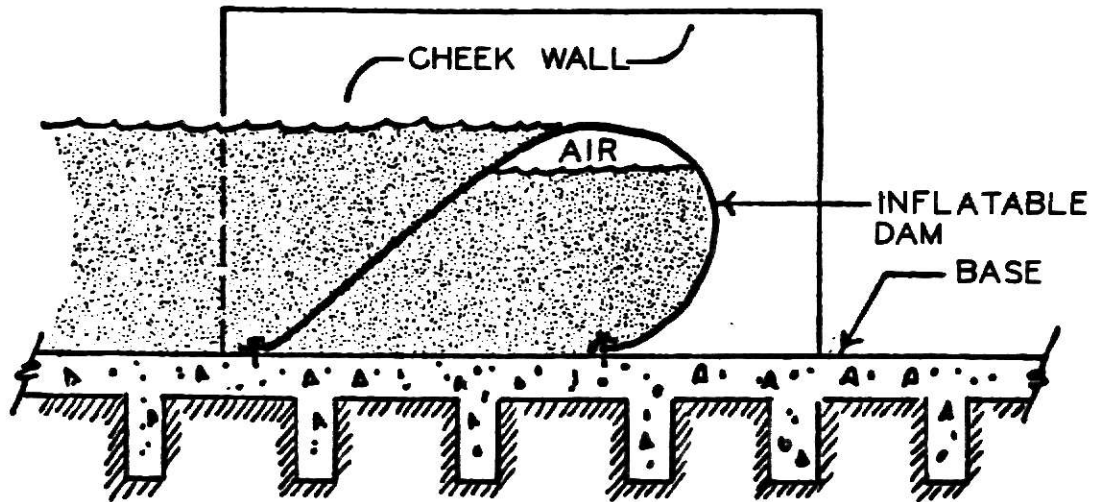
Furthermore, an inflatable dam (See Figure 15) below the convention center provided an attractive year round water body for development. Some community leaders credit this project for successfully orienting the community to the potentials of the riverfront.¹⁷

A system of bikeways, two fountain areas, the convention center and large hotels now grace the riverfront area. (See Figure 16) The new riverfront development has become the focal point for an annual aquatic festival.

The Water Quality Problem²⁴ Surface water pollution was a major problem in the Wichita Metropolitan Area until recently because of inadequate sewage treatment facilities. Man-made pollutants; the discharge of sewage, and industrial and oil field wastes into streams are great concerns. Unlike natural pollutants, such as salts, these can be controlled and abated to varying degrees. As the quantity of raw, or untreated sewage increases beyond the point where it can be broken down by natural processes, pollution becomes apparent. Surface water pollution becomes a health hazard before it becomes noticeable because of disease carrying organisms. However, increased pollution will result in offensive odors, unsightly conditions and may kill fish and other water life.

Major sewage treatment improvements in Wichita and other cities in the

NORMAL OPERATING POSITION



DEFLATED POSITION

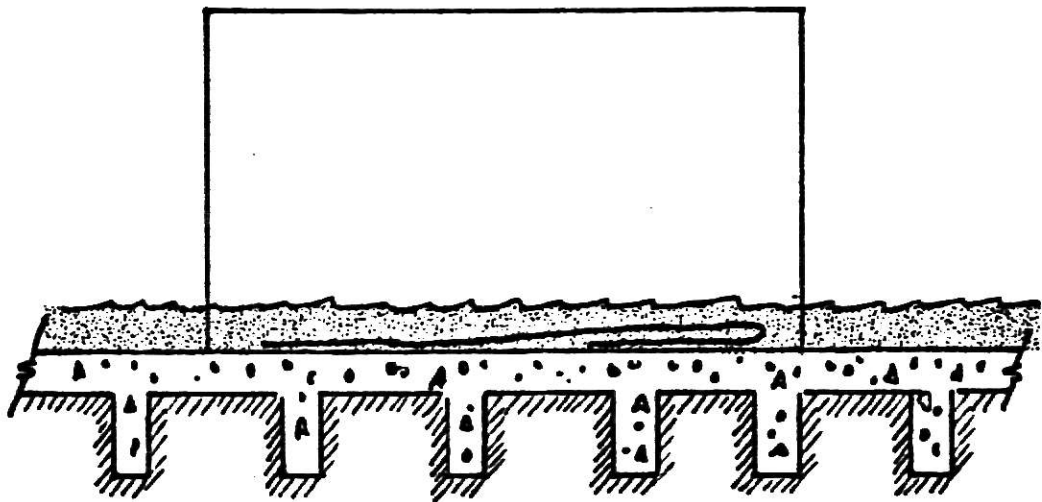
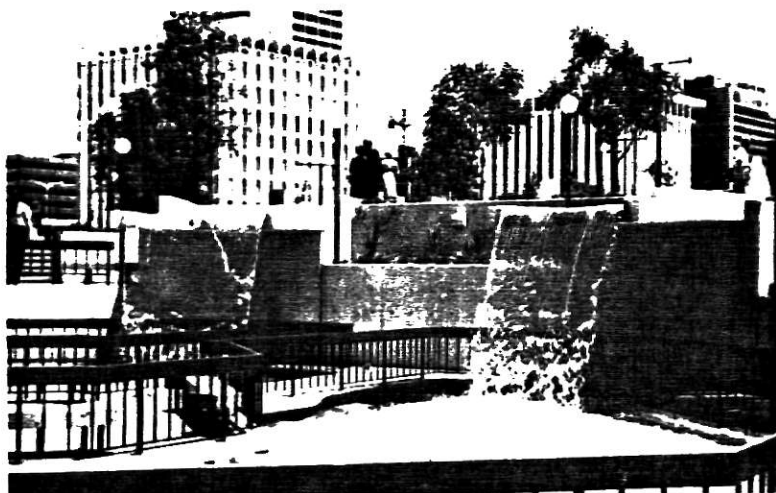


Figure 15: Inflatable Dam, Wichita
(Source: 29)



BIKEWAY



NATURAL WATER FLOW & MAN-MADE FOUNTAIN



URBAN RENEWAL ALONG ARKANSAS RIVER

Figure 16: Photos of Wichita Riverfront Developments
(Source: 17 & 20)

county have considerably reduced the man-made pollution of the area's river and streams.²⁴

Visual Analysis

Image is a composite picture of all the physical characteristics of the environment. It provides a lasting impression of the quality of life within the community. Generally speaking, a positive image generator would be an element perceived favorably and regarded as desirable by a majority of its observers. It might instill feelings of pride, harmony, security, or appear attractive, unusual and interesting, or merely ordered, understandable. A negative image generator would be the opposite an element which would not convey the previous impressions. It might go so far as to be repulsive or ugly, instill feelings of shame, confusion, danger, or peril.

Figure 17 shows the image analysis of the urban sector of the Arkansas River. According to the image map, all elements are identified as to their effect on the positive or negative image.²⁵

The more "imageable" a city, the easier it is to find one's way about in it, even the street pattern is not clear. A new development can be made to tie visibly into a city's street system to form or help reinforce a district. If on an edge, to help strengthen the edge; and if at a seam, to maintain continuity. It can also become a good landmark and an activity node.²⁶

Physical Redevelopment

During the period from 1950 to 1970, the residential population within the center city of Wichita, Kansas dropped from 27,000 to 13,000, a 50% decrease. The effects of outward migration to the suburbs has been significant in terms of lowering the levels of evening and night-time activities. Those urban functions which have been directly effected are decayed housing, retail, cultural and entertainment activities. Construction of various large-scale shopping malls with their climate-controlled comfort and close proximity of shops, has also reduced

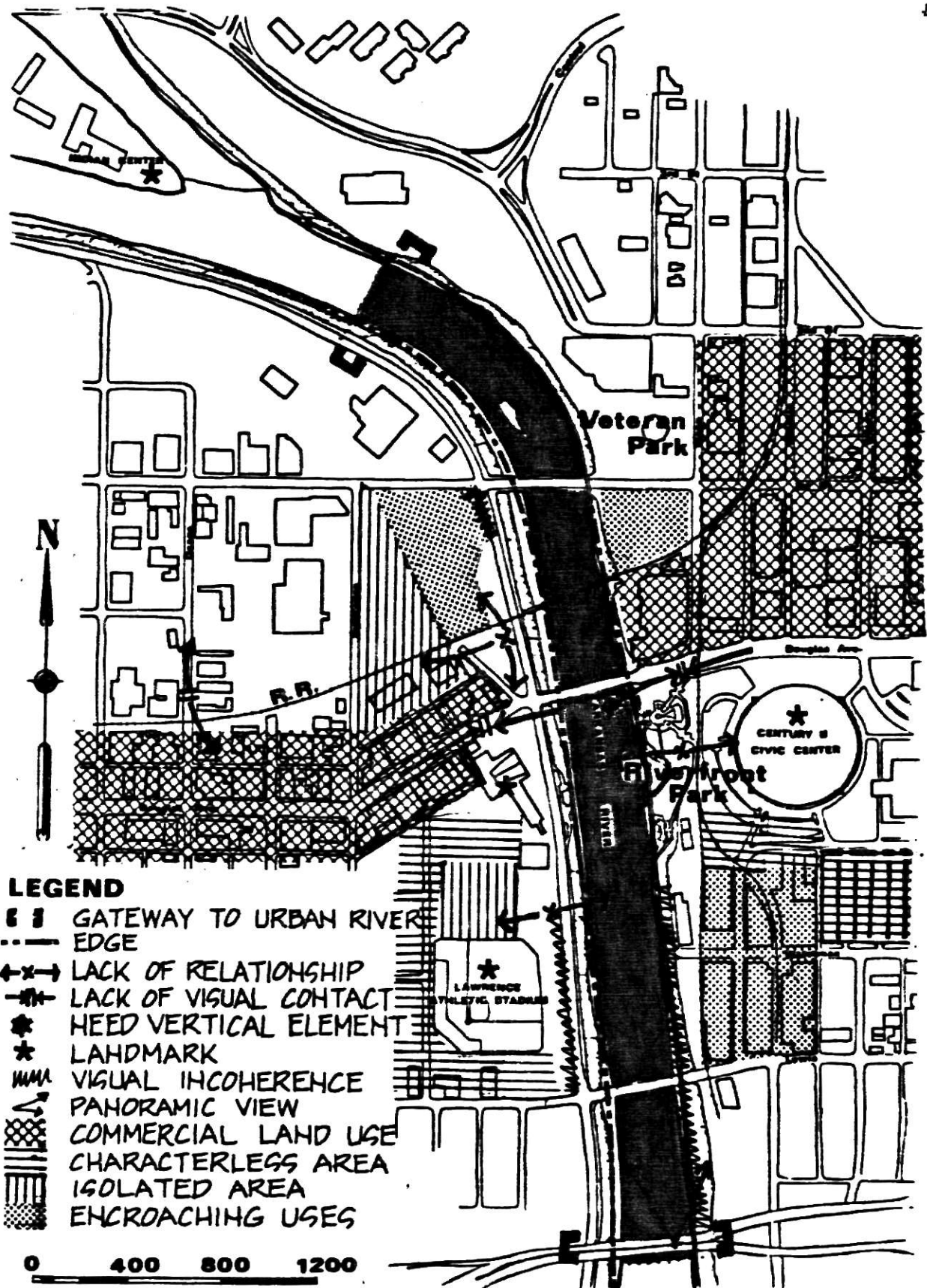


Figure 17: Visual Image on Wichita Riverfront Region

the appeal of the downtown area. It is the major location of office facilities, but not the major retail or commercial center. People exist downtown in great numbers during working hours but leave for the suburbs after five o'clock.

The city of Wichita is aware of the problems occurring in the downtown area. Wichita's Center City Steering Committee expresses its center city concept as strengthening the already strong office concentration in the downtown area and also enhancing the construction of retail and commercial markets. They want to bring extra life back to the downtown area.²²

Widening the Douglas Street Bridge and adding seating areas and tree planters would give the bridge a promenade quality suitable for this auto/pedestrian entryway to the Civic Center area. Fountains would give the river vertically and therefore visibility for extended distances along Douglas Avenue (see Figure 18). Also, the riverfront development should provide year-round multi-use facilities such as ice-skating area during winter and a riverboat restaurant in historic site,²⁵ (See Figure 19)

Management and Government Function

Wichita has demonstrated riverfront activity for over a decade of frequent change in elected city officers. A reported factor in the continuity of riverfront development programs was that the planning director yielded a great deal of power through his control over projects presented to the council. After council approval, a wide variety of community groups provided project support.¹⁷

DIFFERENCES AMONG SELECTED CASES

A local concept of riverfront design and environmental quality has to be derived from the particular characteristics of the city itself. Thus, the study approach deals with post-design evaluation within three sample cities as a guide for synthesizing the current riverfront redevelopment issues in Lawrence.

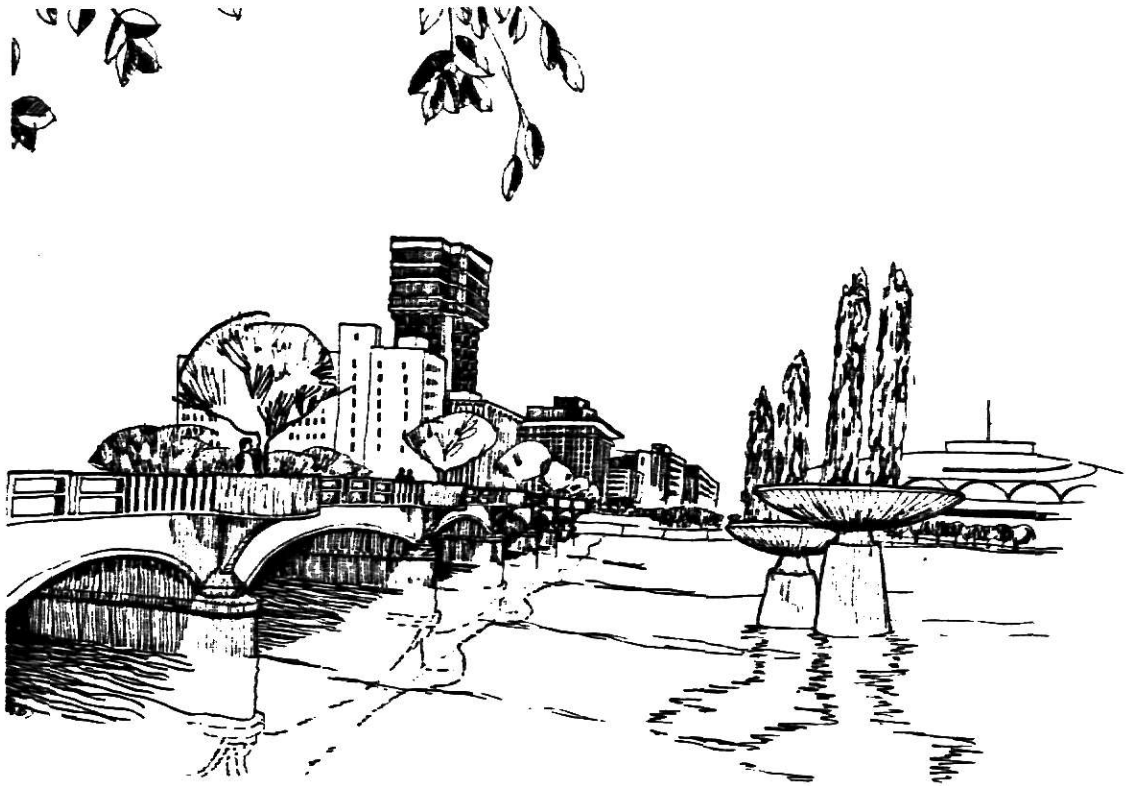


Figure 18: New Image of Douglas Ave. Bridge, Wichita
(Source: 25)

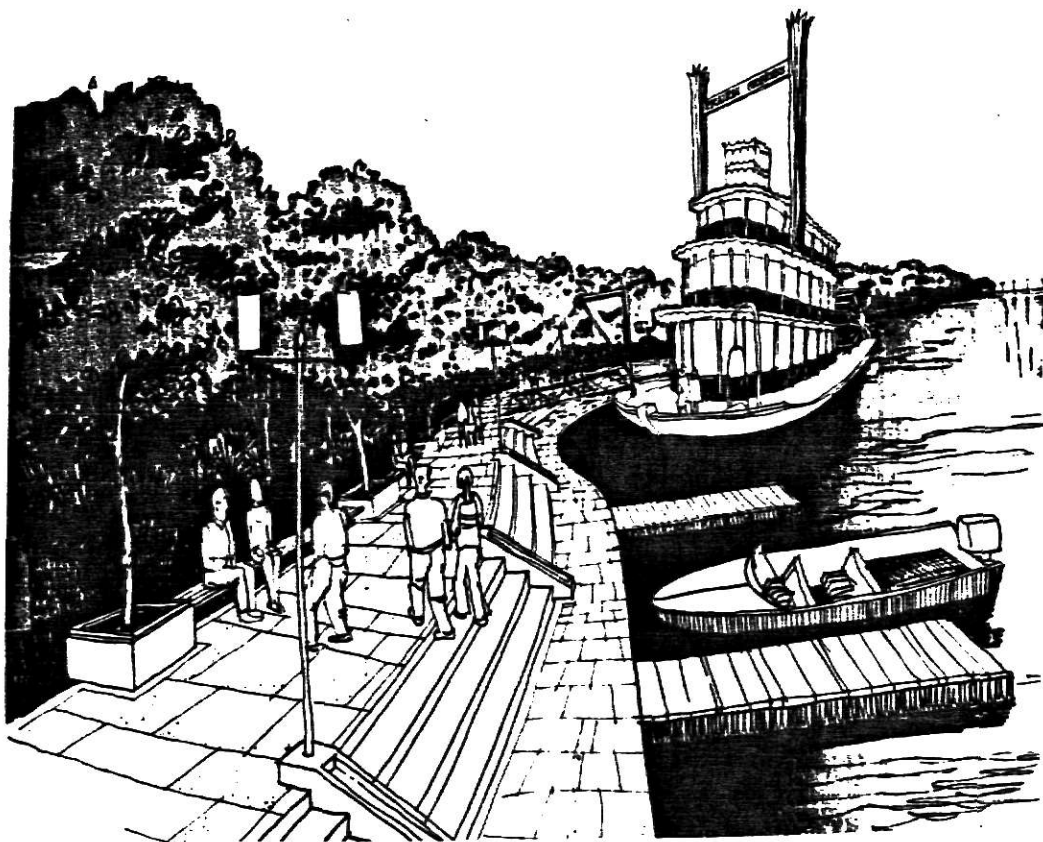


Figure 19: Proposed Riverboat Restaurant,
Wichita (Source: 25)

New Orleans Urban Riverfront

The New Orleans riverfront has intricate systems of drainage and levees. The Mississippi River and the levees that separate the riverfront from New Orleans are both actually higher than the street level. Normally it should be easy to see water as one strolls around. But the fourteen-foot-high levees block the view.

The port of New Orleans is the second largest in North America. Marine trade is the city's main economic source of income., even ahead of tourism. Because of inadequate marshalling space for modern containers, most wharves are obsolete. Long-term plans call for the dock facilities to be cleared and converted to public use - perhaps recreation.

San Antonio Urban Riverfront

San Antonio is a good example of a city which has been restored, or is in the process of restoring its historical riverfront.

The San Antonio River is a highly commercial, tourist-oriented attraction. Known as River Walk (Paseo Del Rio), the downtown reach consists of beautified walkways below street level and adjacent shops and restaurants. Several varieties of water craft provide interesting transport for visitors. There are frequent cultural and festive events along the river. The unique development of River Walk is succeeding very well in spite of the trend toward decay of the urban core in most cities.

According to "San Antonio Prototype", Figure 20 shows the visitor's reaction to the River Walk environment. They were asked to rank from "good" to "poor" their evaluation of the quality of six major elements. Because such an overwhelming number rate all elements highly, the design and development decision-makers seem to have adequate support for their decisions. The relatively lower percent of visitors who ranked "don't know" is due primarily to the relatively lower number who had been exposed to the environment.

The success and achievement of River Walk can be attributed to a combi-

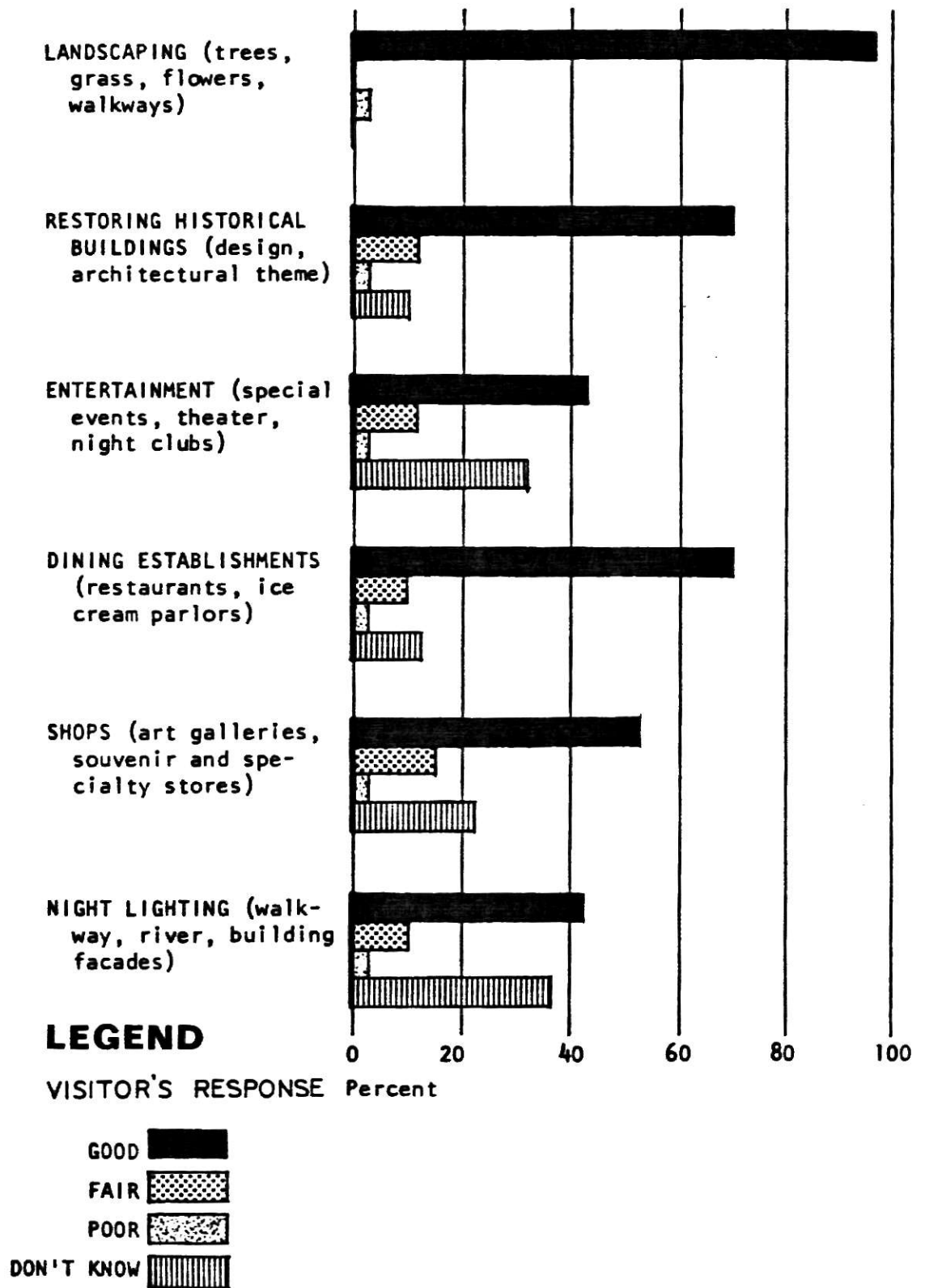


Figure 20; Response of San Antonio River Walk Visitors to Six Factors. (Source: 20)

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nation of factors, including: (Appendix B will give more detailed description)

1. The River Walk is unique.
2. The River Walk is a unified whole.
3. The River Walk contains diversity.
4. The River Walk has a delicate balance between recreational and commercial facilities.
5. The River Walk has great social and economic value.
6. The River Walk is a cohesive Whole with dynamic internal forces.
7. The River Walk has an atypical physical setting.

For other river areas:

1. A refocus upon downtown can be accomplished.
2. A small amount of water can become a powerful social force.
3. Composite management can succeed.
4. A business-park mix can be functional.
5. Diversity is successful.
6. Internal and adjacent land uses must be compatible.
7. Both tourists and local citizens can participate.
8. Can provide state tourism stimulus.

Wichita Urban Riverfront

The urban sector of the Arkansas River is a principle urban design element in Wichita. The existing challenge is to better integrate the downtown area with the riverfront development. The good connection and new development within the riverfront region will stimulate people back to the C.B.D.

A river will contribute little as a recreational resource if visual quality is lost. Because of the horizontality of the Arkansas River and Wichita's flat topographic setting, the visual value of the river is lost to those more than a few steps away. One of the significant advantages that the river affords for the city is that it provides a safe and attractive pedestrian and biking system along the river for the downtown people.

CHAPTER III

Similarities

Chapter III

SIMILARITIES OF URBAN RIVERFRONT REDEVELOPMENT

The analysis of riverfront redevelopment experiences in other cities can serve to clearly define the overall context for the riverfront redevelopment in Lawrence. A selected review of literature of the cities with riverfront redevelopment reveals the following:

General Problems ²⁷

The Changes of Riverfront Uses. The role of the "downtown" riverfront has changed markedly over the last century, and has its relationship to the city. Inability to respond to change is a principal cause of riverfront blight.²⁸

Disbelief that Riverfront Redevelopment Would Work. Putting together a successful redevelopment project in a riverfront area remains a complex and costly undertaking. The most notable obstacle is in securing private financing because of the state of mind that people do not believe the redevelopment will succeed. That kind of reluctance on past businesses is lessening, but it certainly is not gone. And it is only one of the problems likely to be encountered in any riverfront redevelopment projects.

The Derelict Condition of Many Riverfront Properties. Old warehouses and other buildings may need major repairs, and outmoded railroad facilities and rotting piers may have to be removed.

Undesirable or Competing Uses of Riverfront Land. Towed cars, junk of all sorts, dredge spoil, lumber, automobiles awaiting shipment, tank farms, and oil refineries - all have found a home on the riverfront. Redevelopment means finding a new location for such facilities, often at considerable public and private cost.

Access to and Along the River's Edge. Should the public be allowed access to the river? Should there be restrictions on building height and configuration to protect public views? These are difficult questions because of the high demand for sites close to river and the finite nature of the resource. Since river is a common property, the disposition of shoreland is often considered a public interest issue. But the public interest may conflict with private property rights, development proposals, and someone's idea of appropriate economic return.

Water Pollution. As a consequence of massive public investment, the nation's rivers are cleaner today than they were fifteen years ago. But non-point sources of river contamination -- runoff from farming and construction, seepage from mines and industrial waste sites, and overflow from combined storm and sewage drainage systems in older cities -- are still a problem. Since riverfront areas are susceptible to storm and flooding damage, expensive bulkheading or erosion control measures may be needed. There are federal funds available for such projects, but competition for these funds is heavy and the delays may be considerable.

Divided or Confused Ownership. Shifting shorelines often make it difficult to determine the lines of demarcation between private holdings and public property. Especially in cases where railroad lines are involved, parcels of land may be splintered among various owners or tied up in complicated legal proceedings.

Fragmented Government Jurisdictions. Riverfront development can quickly involve an array of federal government participants: the Army Corps of Engineers, the U.S. Coast Guard, Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Maritime Administration, and EPA, among others. On the local level, beyond the usual city authorities, there may be an indepen-

dently chartered port authority, often with its own taxing authority and elected board of governors.

Where We Are Now

There is at present very little use made of urban rivers and most have been badly abused. Plans are being made in most cities for the realignment of policies governing their riverfronts. A few cities are beginning the implementation or redevelopment that incorporates the open space, aesthetic and recreational values of their rivers.

A number of factors have come together in late 1970's and contribute to the urban riverfront redevelopment. Among them:²⁷

An Increasing Concern. New development ignores the aesthetic and visual amenities of the river. Pressure came from conservationists, preservationists, and historical restorers asking to redevelop urban river corridors. Continued concern is over flooding problems of urban areas.

The Nation's Gradual Success in Cleaning up its Rivers. Between 1972 and 1977, the federal government spent \$18 billion on treatment facilities - a public works investment comparable to the massive interstate highway system. Among developers, the perception is growing that riverfront areas present opportunities for commercial, residential, or mixed-use projects; and when the full impact of cleaner water is felt, riverfront property values are likely to soar.

The New Economic Attractiveness of Reusing Older Structures. The high cost of new construction is beginning to make preservation, once considered merely quaint, economically practical.

The Back to the City Movement. Riverfront areas, often close to the city's core, have much to offer the middle-class professionals, retired people, and young people who are moving back to center-city areas. In addition, the

gasoline shortage has made living in downtown locations, where residents are less dependent on cars, increasingly popular. More indirect are the impacts of slow-growth or no-growth policies and practices, which have caused planners and developers to examine the potential of urban land - including riverfront land - that had been overlooked in the past. Riverfront areas have benefited from people's willingness to venture forth to shop, eat, and live downtown.

The New Urban Emphasis on National Recreation Policy. The National Urban Recreation Study, released by the Interior Department in February 1978, identified decaying urban riverfronts, along with railroad rights-of-way (often in riverfront areas), utility corridors, and reservoirs, as potential recreation areas. Later in the year, in response to needs outlined in the study, Congress authorized the Urban Parks and Recreation Recovery Program, which is a source of funding for the upgrading of many older riverfront parks.

Physical Contributions

The urban riverfront offers unlimited development or redevelopment opportunities both from an architectural and a resource point of view. By removing incompatible uses along the riverfront, the community is more likely to realize the potential of urban riverfront redevelopment. Once land has been cleared, redevelopment should be used in a comprehensive way to improve riverfronts and set them free from transportation barriers, blight, and dumps in order to realize their environment values.

Four basic redevelopment land-use types are considered as follows:²⁹

Use of the Riverfront for Residential. It is a pleasure for people to live on the riverfront area and make a living in harmony with the river. Riverfront subdivisions attract families who own boats or who are attracted to water-borne activities and sports. The most suitable housing type would be townhouse condominiums, since more units are able to share in a given

amount of space. Boat tie-ups and/or slips can be planned in conjunction with the residential area. This will permit the home owners to park their boats near their homes during the heavy use periods, such as weekends and holidays. Complete services to the boat slips, such as electricity, water, and sewage, may be impractical and expensive, since these facilities are usually included at a marina where the water craft can receive better protection from weather and high water.

Detached houses are less applicable where the planned development may include channels or inlets. This type of development calls for considerable dredging. The cost of preparing sites in a flood plain is high. The additional cost is in the land fill required to bring building sites above seasonal high river flow and/or water table. Vacant sand and gravel pits are now recognized as possible riverfront residential sites.

Use of the Riverfront for Commercial Development. Commercial areas adjacent to river generally appear to be in decline. Much of what has happened is due to changing land use whereby undesirable uses have been allowed to develop between the commercial center and the riverfront. Undesirable uses may be present in the form of industries which pollute the land, air, and water, or in the form of decaying structures which are visually unpleasant. If undesirable land uses cannot be removed, steps can be taken to create buffer strips or parking areas to separate them from the commercial areas.

Commercial buildings, which are already backed-up to the river, can create and install new riverfront entrances that connect to a riverfront walkway or mall. Older structures may be replaced by new shops, restaurants, and businesses which deal in water sports and water craft. Riverfront stores and shops also have the ability to take on new images by creating interesting storefronts.

Hotels and motels with resort-type facilities may contain riverfront

docking facilities where boaters may dock for an overnight stay. High rise structures, such as office buildings, can make good use of the riverscape due to their vertical mass. By opening the entrance level to the riverfront, an unobstructed view can be maintained. The aerial view from the tall buildings would make a pleasant contrast with the concrete and brick urban landscape.

Use of the Riverfront for Industrial Development. Strict water pollution laws, regulating the dumping of untreated industrial wastes, has limited expansion of some industrial districts until suitable measures for the treatment of wastes are provided. Some industrial plants have been forced to close.

Riverfront sites offer certain advantages for "clean industry" in terms of labor force proximity and availability, transportation and water. Warehousing and trucking operations are more compatible, since they are less chance adding to the pollution problem. Site development can take on a park-like character with tree-lined drives, attractive landscaping around the building, and architecturally pleasing structures. The industries could be clustered and buffered at selected riverfront locations, so the riverfront communities are allowed to orient towards the river.

Use of the Riverfront for Recreation. Riverfront is an excellent site for recreational activities that are in great public demand. Water-borne uses such as boating, water skiing, swimming, and fishing, depend upon adequate water, shoreline, adjacent land, and, perhaps the most important, water quality.

Narrow rivers with limited navigation space are more suited for low powered craft such as small fishing boats, canoes, row boats, and possibly man-powered paddle boats. Wide rivers with unlimited navigation are best suited for a broad range of water-borne recreation activities.

In order that each water activity may be successful, various zones of activity may be established according to the spacial needs, boat speeds, and shoreline requirements. While there is a confusion and intrusion between boating

and water ski areas, speed regulations and buoyed markers can contribute towards defining and controlling various zones. "No wave zones" are found along public boat docks, marinas, and launching ramps. "Slow speed" signs are posted near the dam and locks. In areas where water skiing is popular, signs are posted to warn approaching boaters of ski activity ahead.

Due to the nature of water skiing, it should be planned for special zones along the river. In choosing a water ski area, there are several important factors which warrant consideration. First, the water ski zone should be placed well away from marinas and boat docks to avoid damage to the docks and moored boats from the wave action. Second, the water should be free of partially submerged objects - trees, anchor cables...etc. Third, it should have inland access for cars and parking. Fourth, a shoreline ski shelter and dock containing emergency equipment should be considered. Fifth, the average standard space needed for water skiing is one acre of water per boat. Also, the sample surveys of existing skiing activity within the area should be done for reference.

Water skiing and swimming are most readily endangered by water pollution. The river must be of a quality suited for body contact. Vacant, sand dredging sites are the most ideal swimming areas. Care should be taken not to choose a site that is near industrial or commercial areas. Access through a residential area to the swimming beach is more desirable.

Physical Limitations ²⁹

Water Pollution. It is one of the major limitations to the riverfronts for any use. Some of the losses which may be attributed to pollution include: curtailment of recreational uses; increase water treatment costs; loss of industry; corrosion of boats and structures, and reduced property values. River water, even though essentially clean from man-made pollution, is seldom suitable for use as process water due to its silt content and other contaminants.

Air Pollution. Today, the air pollution problem has become one of the major factors in planning our urban areas. Industry is criticized as being the chief contributor of air pollution. One possible means of reducing the level of pollutants would be to maintain strategically located open spaces within and between urban areas. Since natural ground cover exerts a cleansing effect upon air which passes over it, open spaces would increase the distance between sources of contaminants, permitting greater dilution and dispersion of pollutants.

Flooding. There are, generally, two approaches to the flood damage prevention. One is to control the extent of flooding by constructing dams, reservoirs, dikes and other protective works. The other one is to reduce the damages by changing the use of land of those uses least affected by flood hazards. Also, regulation of land use in flood plains such as flood plain zoning, subdivision regulations, and urban renewal, is now being recognized as a vital tool in damage prevention programs.

Reuse of riverfront areas would be limited by flood plain considerations. Rundown riverfront structures subject to periodic flood damage should be cleared under urban redevelopment efforts.

Soil Conditions. Soil will have a definite effect upon the type of architectural structure and its bulk, height, and type of footings. Various urban riverfront developments may be affected by soil movement. The up and down movements are usually related to swelling and shrinking of soil resulting from changes in moisture, and the lateral or sideways movements are usually the result of landslides or soil creep that are related to seasonal moisture variations. An increase in soil moisture will affect the stability of soils in two ways: First, the water adds to the weight of the soil, which increases the gravitational forces tending to cause a slide; secondly, the water usually lowers the strength of the soil, which must provide resistance to the down-hill sliding motion. (See Figure 21) This occurrence usually happens just after heavy

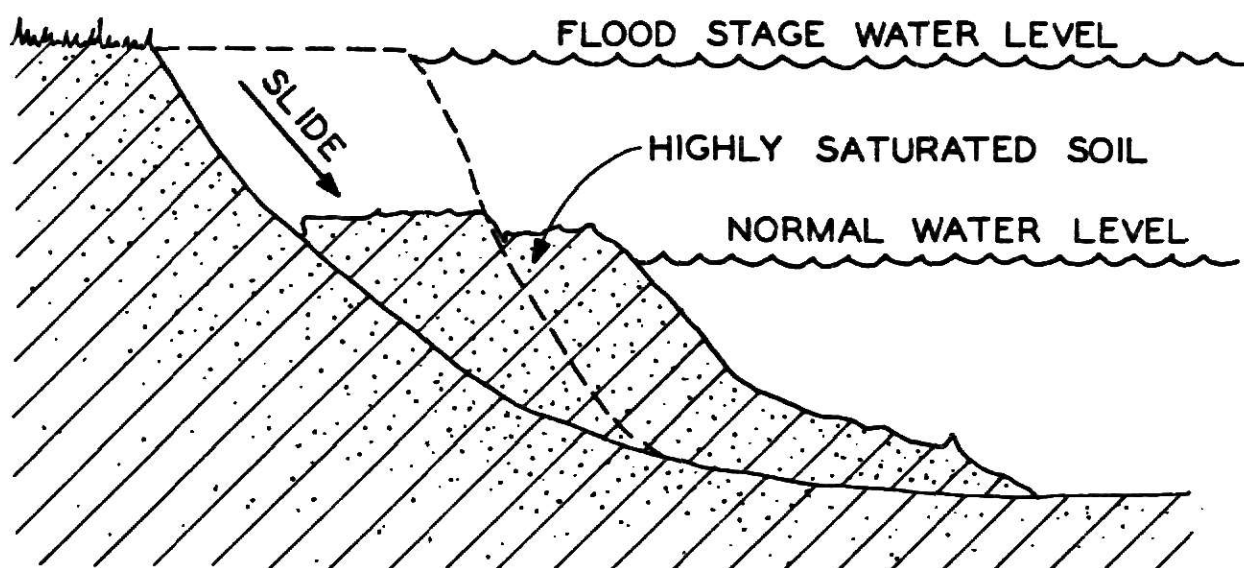


Figure 21: Effect of Saturated Soil Along Riverbanks
After High Water (Source: 29)

spring rains. Large trees and tons of soil slide into the river, where they become a danger to navigation, recreation, and shoreline structures.

Engineering factors which need to be considered for planning riverfront redevelopment are:

1. Soil or rock type: stability; difficulty of excavation; suitability for fill.
2. Surface water causes: rainfall; irrigation; evaporation.
Surface water effects: increased run-off; erosion and silting; flooding.
3. Excavation and filling: design slope to anticipate maintenance; design slope to provide safety.

Hydrology. Soil and hydrology are the two most interdependent factors relating to riverfront redevelopment. Soils affect land use that relate to riverfront and hydrology affects the water use relating to the land use.

River characteristics such as the normal depth, width, and velocity will affect most planning considerations for the recreational uses. The width and depth of a river will determine the amount and type of boating activity. Some rivers carry very little water during the summer months when recreational demands are greatest, but by their physical nature, they may have the capacity to contain the necessary water to allow expanded uses.

Normal water flow of the river probably relates to the problem of pollution and siltation. The river itself must carry enough water to dilute pollutants below the danger level. During the siltation process at flood stages, the sand in the river bed stirred up by the current, rises off the river bed and goes into suspension. When the current slows, the suspended material drops, the heaviest first, with the finer material progressively following until the finest, tightest, silt and clay carried in the river winds up on the top, very effectively sealing off the bottom and the banks, and in many cases practically

water tight.

Climate. Seasonal temperatures and atmospheric conditions may restrict the use of river and riverfront land to the warmer months. Where it is economically and functionally possible, facilities should be planned to permit multiple use for year-round benefit.

Micro-climate such as high humidity, fog, and haze cause problems of visibility or personal discomfort. Fog and haze are especially detrimental to river vessel traffic and the ability to get a view of the riverfront. Climate should be treated as a resource and as a guiding factor to redevelopment. San Antonio is one of the good examples which fully develop the potential of micro-climate zone.

Riverfront Planning Goals

Certain goals should be considered in the formation of urban riverfront redevelopment. Some of them are listed on "Waterfront Renewal" by Wisconsin Department of Resource Development.²⁸ When chosen, the goals should reflect the needs of the community as a result of specific conditions along the river.

Improving Surface Water Quality. Surface water pollution is the most important river-related cause of urban riverfront deterioration in all but industrial and cargo-handling areas. Pollution also imposes severe limitations on the reuses to which parcels of riverfront land can be put. Today most states have good water pollution control standards, but the most difficult problem is monitoring and policing the rivers.

Increasing Public Use. People can derive maximum enjoyment from the river when they have visual and physical access to the river. For this purpose, designers can provide facilities such as boat ramps and marinas which allow for active enjoyment of the river, and designs to increase passive enjoyment, such as merely improving or increasing the view of the river.

Increasing the Amount of Upland Benefiting From the River. Often the only parcels to benefit from a riverfront location are in a narrow strip along the river. Through cluster design, other forms of lot arrangement, and limits on the dimensions of riverfront buildings, the view of the river can be enjoyed from farther inland. Numerous riverfront parks also provide inland lots with more of the benefits of being relatively near the river. In industrial areas there can be two tiers of industrial sites, one along the river's edge for firms needing water transportation and the second, inland tier connected to the riverfront by pipelines or conveyer belts.

Multiple Use of Riverfront Land. The river itself should be developed as a linear park of ultimate diversity. And also, an attempt should be made to have the riverfront land serve more than one function, such as recreation and flood control. This variety creates much of the interest of the riverfront.

Insuring Historical Preservation and Maintainance. The urban riverfront is usually the oldest part of the city. Some old structures which, while not genuinely historic, evoke the unique flavor and fascination of an older and more colorful era on the riverfront. Urban renewal is one of the best means to preserve these historic features as living, useful parts of the riverfront environment. Since dilapidated riverfront structures are expensive either to repair or to replace, more thought should be given to means of enforcing maintainance. That means stricter controls are needed to compel maintainance of riverfront retention structures and removal of abandoned piling.

Achieving Aesthetic Potential. Good riverfront design involves combining the many visual assets of the riverfront into interesting and meaningful patterns which people will enjoy seeing often. Views of all riverfront functions should be developed, and if anything, the contrast with their surroundings may increase

the interest in the riverfront. Both natural beauty and human interest should be capitalized by the designer.

Managing Development. Zoning laws, subdivision regulations, building codes and business operating policy are regulatory controls to insure proper development and preservation of all riverfront areas for future generations. New ordinances are needed to deal with new riverfront problems. During the planning process, various federal, state, and local agencies are involved. Coordination among these various agencies & planners is the key point to get development done successfully.

Aesthetic Considerations

The water itself is a source of pleasure. The river's fluid movement, sense of coolness, reflective quality, and the array of water-borne activities it supports, all evoke a feeling of relaxation and lightheartedness.

Good riverfront design involves combining the many visual assets of the riverfront into interesting and meaningful patterns which people will enjoy seeing often. At night, the riverfront can become a show place of creative lighting, with the water distorting the reflected lights and colors into new patterns.

Although many of the unique riverfront activities and structures have vanished or lay in ruin, some of the old buildings may have aesthetic values which reflect the city's past as a river port. Blending the new development with the old part is a challenge which, if successfully met, can create lasting aesthetic value.

Achieving Better Riverfront Use

Despite the redevelopment problems, many communities are undertaking riverfront projects. Their funding is coming from a variety of private and public

monies, including HUD's community development block grants and urban development action grants, and Commerce's Economic Development Administration grants. In most cases, federal funds are being used in conjunction with other public money to attract private investment. Smaller riverfront communities may have a more difficult time competing for public funds than larger cities, but they should not be overlooked.

Six different types of remedial action are outlined below.²⁸ They are not mutually exclusive; different types of action could be combined for application to a single section of riverfront. Also, varying types of action would be applied to different sections of riverfront, the decision depending upon actual and anticipated deterioration, and upon the future uses planned for the area. The local government should carry them out as part of a community's over-all redevelopment efforts.

Within the framework of a mixture of government action affecting private property, the proposed actions are listed in order of increasing governmental involvement. The first three steps are as far as government can go without significant public financial involvement. Beyond this point local governments may find themselves spending large amounts of money and being committed to long-term programs.

Slowly Changing Areas. It applied to areas which appear to be improving slowly on their own, or at least not visually declining. Some riverfront areas may, similar to Downtown shopping area, be jolted by development of a new, competing area elsewhere.

In these slowly changing areas, local government should encourage an orderly transition in riverfront land use. It can encourage new construction and repairs which are compatible with anticipated uses of the riverfront. It should discourage new uses which, though legally conforming to present controls, may run counter to the area's future. Potential contributors to stream pollution

should be discouraged from locating where they would be detrimental to transitional areas earmarked for new uses.

Education. Traditionally, both riparian owners and the public have paid too little attention to the forces of deterioration. Education could illustrate the need for fostering voluntary cooperation on the part of riparian owners. Local government can encourage cooperation among riparian owners too; for example, several owners can share the cost of bringing in repair equipment to work on their shoreline structures.

Maintainance. Enforcement of codes and other regulations require a certain level of maintainance for riverfront structures. Ample statutory authority often exists for government action against conditions which run counter to reasonable public use and enjoyment of the water.

Municipal Housekeeping. The city must cooperate by improving its share of the riverfront. Both the best-maintained and the worst-maintained water frontage are often in public ownership. The poorly-maintained water frontage is often at the ends of streets, or tax delinquent property which has reverted to the municipality. In general, the public should do as much, if not more, to improve its riverfront as it expects private owners to do.

At this point a city might also decide to move against all sources of water pollution. Often this would involve cooperation from state agencies. The city may find that its own sewage and treatment system is a substantial contributor to water pollution.

The community should also consider public acquisition of a narrow strip along the entire shoreline. This could be costly, not only initially, but also by placing the burden of maintenance upon the city. Some maintenance costs could be assessed to owners of upland property, at least if they made specific use of the riverfront. This device gives the public much greater control over

the use of the riverfront. This concept of public ownership of urban shoreline may prove to be the single most effective tool for reversing the forces of riverfront disuse, decline, and deterioration.

Selective Clearance. Structures which stand in the way, both physically and psychologically, of the efforts to overcome riverfront deterioration should be cleared. Numerous legal questions can arise at this stage, especially if the public desires to condemn structures which do not appear to be physically deteriorated. One would have to establish that the condemnation was necessary to prevent deterioration which, if allowed to continue, would soon call for even more drastic action in the area.

What to clear and what to save is a problem frequently faced by those concerned with renewal. At what point does one think of saving the area and using selective clearance and when does he think of clearing a deteriorated area, but saving selected structures within it?

Redevelopment. Acquisition and clearance of the blighted area and then disposing of the land for redevelopment in accordance with planned uses. Often certain physical improvements should be made on the cleared site before it is marked. Storm and sanitary sewers should be separated. Shoreline retention structures should be improved or provided.

Clearance often involves relocation of individuals and businesses. To the extent it is necessary to relocate businesses requiring riverfront location, adequate sites would have to be found for them elsewhere on the riverfront. Relocation may be used to concentrate certain types of riverfront activity. For example, docks serviced by larger vessels can be placed closer to open water. Water-consuming uses may be arranged in an order to minimize pollution. New land for these facilities may be provided both through clearance of existing land, and reclamation of land through use of fill. All these show that renewal projects need not be constrained by the existing shoreline.

CHAPTER IV
Lawrence
Riverfront
Redevelopment



Chapter IV

LAWRENCE RIVERFRONT REDEVELOPMENT

PROJECT CONTEXT

Historical Background

Lawrence was founded seven years before Kansas became a state. In 1854, a group of hardy New Englanders pooled their wealth, lives, and aspirations to build one of the focal points in Kansas. Picture the boldness, daring, virtue, cooperativeness, adventuresome spirit, and dedication to an ideal these settlers possessed in organizing the original town company which evolved into the aggressive, spirited city of Lawrence.

A unique part of the history is the city's name. Usually, towns in 1854 were named after an Indian tribe or some local landmark. Following the dictates of their nature, the settlers showed great respect and deference by naming their community after a Boston man, Amos Lawrence. Lawrence never visited the city but he did supply funds for the settlers. He, also, insisted a college be founded and contributed money to start it.

The University of Kansas was located in 1865 by an act of the State Legislature. Starting with a few students, the University now has an enrollment of more than 25,000. The school establishes the "college town" atmosphere of the city.³⁰

Lawrence is the county seat of Douglas County and the major center of commerce between Topeka and Kansas City. Well served by major highways and railroads, the city has grown at a very rapid rate since the early part of this century. The community has attracted considerable light and heavy industry, but the main factor in its growth can be attributed to the University of Kansas. With a 1970 population of 45,700, Lawrence ranked as the fifth largest city in the State and one of the cultural and intellectual centers of the Mid-west.

Physical Setting of Lawrence

The following physical aspects are taken from Plan '95 -- a comprehensive planning guide for the city of Lawrence, Kansas.³¹

Geographic Location. The geographic location of Lawrence has great economic significance. Although located in the midwestern section of the nation, where growth is not expected to occur at the dramatic rate predicted for certain other regions, Lawrence is quite near, in time and distance, to the metropolitan areas of Kansas City and Topeka. (See Figure 22) This location affords the benefits of extensive markets, transportation centers, cultural facilities, and to a certain extent, the availability of jobs.

Climate. The climate is considered favorable to the production of most major crops in Kansas and is also recognized as being one of the most healthful in the nation. The annual mean temperature is 55° F. varying between extremes of an average January minimum of 20° F. and a July average maximum of 91° F. Record highs and lows were 114° F. in 1934 and -25° F. in 1899. Rainfall average 35.6 inches.

Lawrence lies in the path of alternating warm moist air moving north from the Gulf and currents of cold, relatively dry air moving south from the Polar regions. This condition results in frequent and abrupt changes of weather.

Soil Survey. According to Soil Survey, Douglas County, Kansas,³² shown in Figure 23, the soil data in Lawrence urban region as follows:

1. Ev: Eudora-Kimo complex, 0 to 3 percent slopes. This complex of nearly to gently undulating soil is on the flood plain of the Kansas River. Native vegetation: Eastern Cottonwood, American Sycamore, Green Ash, and Pecan.
2. Ew: Eudora-Kimo fine sandy loams, overwash, 0 to 2 percent slopes. These nearly level to gently undulating soils are on the lower

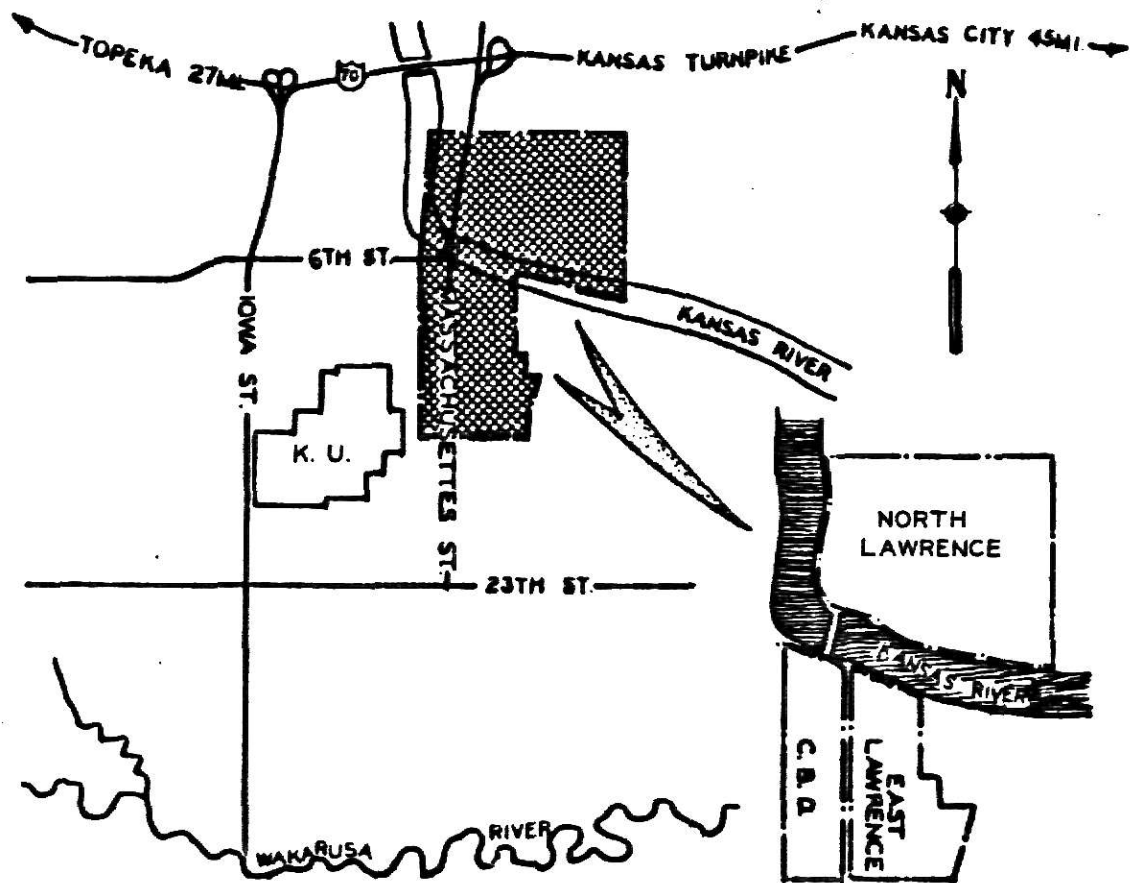
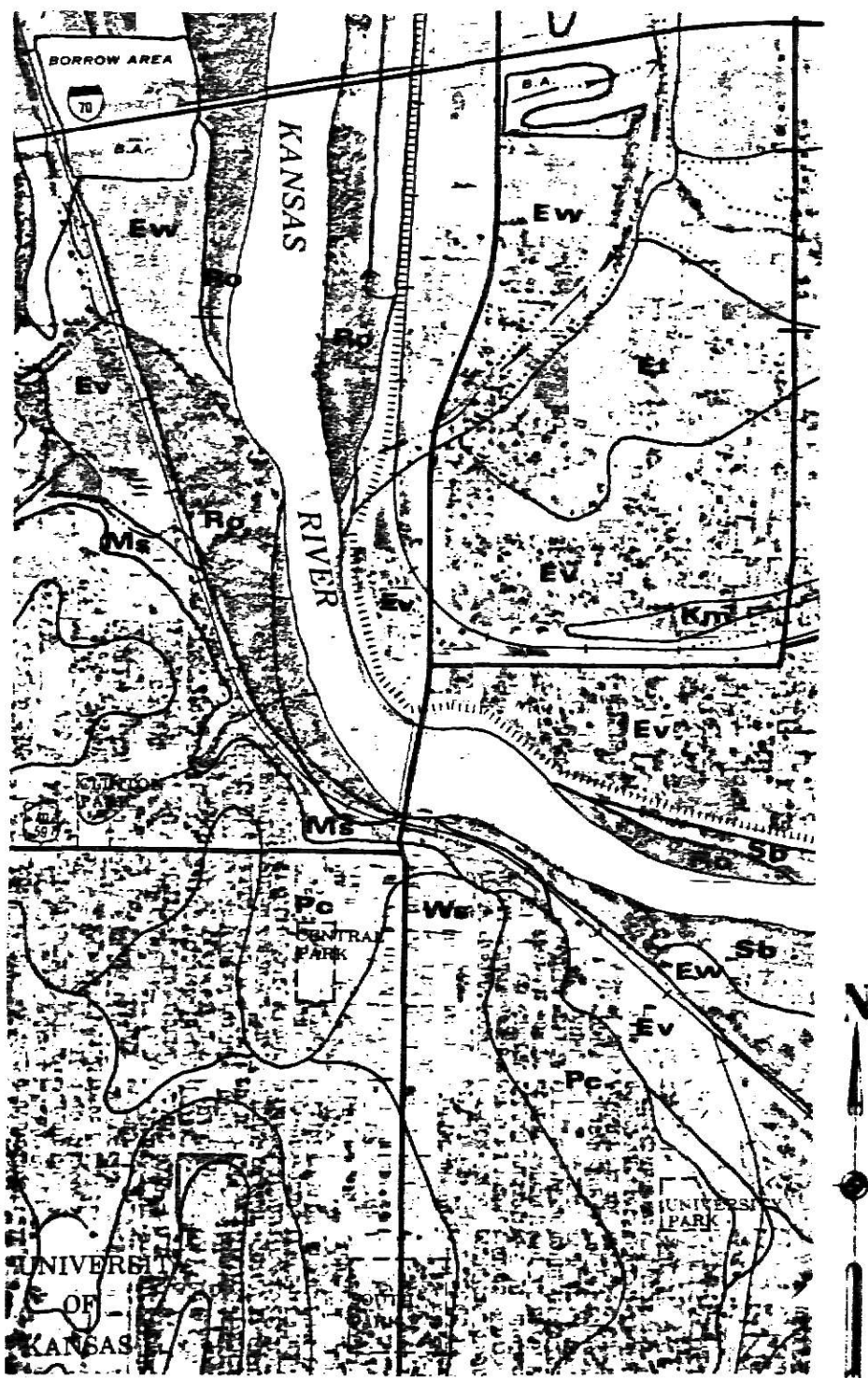


Figure 22: Area Map, Lawrence, Kansas



LEGEND: Ev EUDORA-KIMO COMPLEX
 Ew EUDORA-KIMO SANDY LOAMS
 Ms MORRILL CLAY LOAM
 Pc PAWHEE CLAY LOAM
 Ro RIVERWASH
 Ws WOODSON SILT LOAM

Figure 23: Soil Survey, Lawrence Riverfront Region
 (Source: 32)

parts of the flood plain of the Kansas River. Native vegetation is similar to Ev.

3. Ms: Morrill clay loam, 7 to 12 percent slopes. This strongly sloping soil is on uplands, mostly on side slopes along drainageways.
4. Pc: Pawnee clay loam, 3 to 7 percent slopes. This soil is on side slopes on uplands.
5. Ro: Riverwash. This land type consists of an unstable mixture of sandy and loamy sediment on the lowest level along the Kansas River. This mixture is constantly changed, deposited, or removed, depending on the water level and the location of the river channel. Each time the river floods, the Riverwash deposits change in depth, size, and other characteristics. Native vegetation: Cottonwood and Willow.
6. Ws: Woodson silt loam, 1 to 3 percent slopes. This gently sloping soil is on ridges and old stream terraces.

Topographic Features. Lawrence lies primarily on gently rolling land along both sides of the Kansas (Kaw) River and extends towards the Wakarusa River in the South. A main tributary valley borders the town on the east and a smaller valley drains the northwestern section. To the west and southwest is a high ridge, on the eastern promontory of which (Mt. Oread) Kansas University is located. From here, one has a scenic view of the city and the valley of the Kaw River to the north and the Wakarusa Valley and rolling hills to the south. (See Map 5)

Limitations on the pattern of growth and development are established by the flat flood plains of the two rivers which surround the main developed area on three sides. These plains were subject to periodic flooding which had historically restricted development, notably in North Lawrence. Under land use and construction controls, the flood plains offer sites for industry. However,



Map 5: U.S.G.S. Topo Map of Lawrence , Kansas

the flood plains also contain some of the richest farmland in the region.

Geological Features. A geological survey should be made in order to avoid rock formations as much as possible in placing facilities underground, to determine if developments are being placed on potentially usable mineral resources, and to furnish information about water resources and pollution dangers.

Natural Resources. Limestone is available and sand and gravel occur in abundance along the major streams, but the same minerals also are available in nearby areas. Except for agricultural production, raw materials available in the Lawrence area probably will not significantly affect the economic base for the future.

Social Conditions*

Data on the economic base and human resources form the foundation for insight into the community's potential for growth, according to Lawrence Plan³¹ '95, related socio-economic characteristics generated by such growth and resultant demands for land, capital improvements and public and private services. The realistic community goals, objectives and policies may be formulated from these basic inputs.

Population Trends and Projections. Since 1971, a Federal-State Cooperative program for local population estimates has been carried out by the Bureau of the Census. The Census Data, providing annual estimates of the county population in this research, are used for all projections in an effort to maintain consistency. Those data included all persons living, at the time of count, within Douglas County regardless of tenure or permanence and therefore includes K.U. and Haskell students with the exception of commuters from points beyond the

* Data taken from Plan '95, if not specified.

county boundary.

Table 1 demonstrates the apparent annual population fluctuations. The relative sizes of Lawrence and Douglas County, as well as the ratio of student to non-student populations, are expected to change (see Table 2). The drop in K.U. enrollment (expected after 1980) is significant. The increase in non-student population will come largely from migration in the form of graduating students remaining in Lawrence, or new industry providing the basis for increased in-migration. The population projections* suggest a very wide band of possible growth ranges with a probable growth line towards the bottom of that band. As has been stated, community industrial development, or lack of it, will have tremendous impact on what actually happens.

TABLE 1

Population of Lawrence and Douglas County, 1960-1979

Year	Population	
	Lawrence	Douglas County
1960	32,858**	43,720**
1970	45,698**	57,932**
1971	41,815	59,800
1972	42,130	60,900
1973	46,128	61,800
1974	42,626	55,643
1975	49,989	63,863
1976	46,386	60,297
1977	48,184	62,842
1978	50,814	65,583
1979	58,461	74,158

Source: U.S. Bureau of the Census, Federal-State Cooperative Program for Local Population Estimates, 1971-1979.

**U. S. Bureau of the Census, 1960 and 1970 Census Data.

* High confidence can be shown in the projections for the next three to five years with a lessening degree of confidence through 1985.

TABLE 2

Population Projections to 2000 for Lawrence and Douglas County

YEAR	NON-STUDENT POPULATION (1)	K.U. ENROLL. LIVING IN LAWRENCE (2)	HASKELL ENROLL. (3)	TOTAL LAWRENCE POPULATION (4)	TOTAL DOUGLAS COUNTY POPULATION (5)
1960	Actual 24,637	7,261	960	32,858	43,720
1970	Actual 29,765	15,019	914	45,698	57,932
1975	Actual 30,289	18,500	1,200	49,989	63,863
1980	Max. 37,500 Min. 34,800	19,500 17,000	1,300 1,000	58,300 52,800	74,900 69,550
1985	Max. 41,700 Min. 36,000	18,000 16,000	1,300 1,000	61,000 53,600	75,970 70,620
1990	Max. 47,800 Min. 39,400	16,000 14,000	1,300 1,000	65,100 54,400	82,390 71,690
1995	Max. 52,700 Min. 41,800	15,000 14,000	1,300 1,000	69,000 56,800	89,880 75,970
2000	Max. 58,200 Min. 44,000	15,000 14,000	1,300 1,000	74,500 59,000	94,160 79,180

Sources: 1. Adjustments to basic projections.

2. Kenneth B. Anderson and George B. Smith, A Study of Enrollment Trends in Higher Education in Kansas, State Education Commission, January 1974, with consultant's adjustments from 1985 to 2000.
3. Administration record of Haskell Indian Junior College.
4. Summation of Columns 1, 2, and 3.
5. Adjust upward 7% of the projections from 1980 from Kansas State University Population Laboratory.

Age and Sex Composition of Population. According to the 1960 and 1970 censuses, the number of males and females in all age groups in Lawrence was nearly equal. But through the year 2000, females are expected to increase slightly to about 52 percent of the total population.

The percentage of the population in the 0 to 4 age group is expected to drop. Declining birth rates will be responsible for this decrease. The 25 to 49 age group will exhibit the greatest percentage increase. The gains will be due mainly to expanded economic growth and the concomitant in-migration expected through 2000.

Lawrence will continue to be a community of relatively young, active people. This can be expected to add to the progressiveness and growth of the community as it has in the past.

Income. The community's aggregate income is the most tangible aspect of the local economy. However, the most recent Bureau of Census data on the distribution of income are available for families and unrelated individuals in Douglas County for 1969 only.

Table 3 shows the aggregate income, by type, for families and unrelated individuals and by sex. In 1969, the number and percentage of families with incomes below \$5,000 per year was 2670, or 21% of all Douglas County families.

According to Table 4, provided by the U.S. Bureau of Economic Analysis,³³ per capita personal income in Kansas rose at a faster rate than in the U.S. Per capita income in the Lawrence was lower than the statewide average due to the large student population in Douglas County; however, per capita income rose at a more rapid pace than was found statewide. Also, it is at a faster rate than inflation.

Kansas University Impacts. Perhaps the most important facet of Lawrence economy, affecting all sectors, is the presence of the University of Kansas. The University has played a dominant role in the economic development of the

TABLE 3
Douglas County Aggregate Income, 1969

INCOME CATEGORY	FAMILY	UNRELATED INDIVIDUAL	MALE	FEMALE
Wage & salary	\$10,055,060	\$2,371,520	\$9,264,555	\$3,143,985
Non-farm, self- employment	1,160,715	118,370	1,171,160	111,845
Farm, self- employment	267,265	48,195	295,115	18,580
Social Security or Railroad Retirement	353,940	164,885	279,045	269,690
Public assist. or Welfare payments	35,560	21,855	21,375	40,315
All other income	1,066,355	571,640	1,021,080	606,980
Total	\$12,938,895	\$3,296,465	\$12,052,330	\$4,191,395

TABLE 4
Per Capita Personal Income over the One and Five-year Periods

	1977	1976	1972	Percent	Change
				77/76	77/72
U.S.	\$7026	\$6397	\$4493	+9.8%	+56.4%
Kansas	\$7141	\$6475	\$4470	+10.3	+59.8
Douglas	\$5626	\$5052	\$3462	+11.4%	+62.5%

Source: Bureau of Economic Analysis

area by providing jobs for many and contributing important social and cultural opportunities which draw people into the Lawrence area. The high employment at the University greatly increases governmental employment, and bi-annual influx of students is reflected in retail trade. An increase in manufacturing and related industry, however, will make the University become less dominant in the Lawrence economic picture.

The non-quantifiable effects of the University are in areas of social, cultural and athletic events as well as conferences and lectures. Facilities such as libraries and museums and business and professional services exist which otherwise might not exist in a city the size of Lawrence in its location. In essence, the University's total influence on the community is much more extensive than its direct economic impacts.

Commerce and Employment Characteristics

Retailing. One of the standard measures of a community's general health is the strength of its retail trade. A healthy retail climate indicates a dynamic and progressive community and is an aid in attracting new industry and, therefore, new employment to the community, which in turn adds to the strength of the retail trade sector.

Lawrence has a comparatively strong retail base. As of mid-March, 1973, 3,637 persons (not including self-employed) were employed in primary retail trade at 329 retail establishments, generating in excess of \$15.6 million in wages and salaries. In addition, another 3,174 persons were employed in the finance, insurance, real estate, banking and services sector of commerce. These secondary retailing groups provide \$16.4 million in salaries and wages in 364 separate establishments. The average annual wage in retail trade is slightly greater than \$4,000 and is less than half the regional average. This rather low wage results from the relatively large number of part-time employees

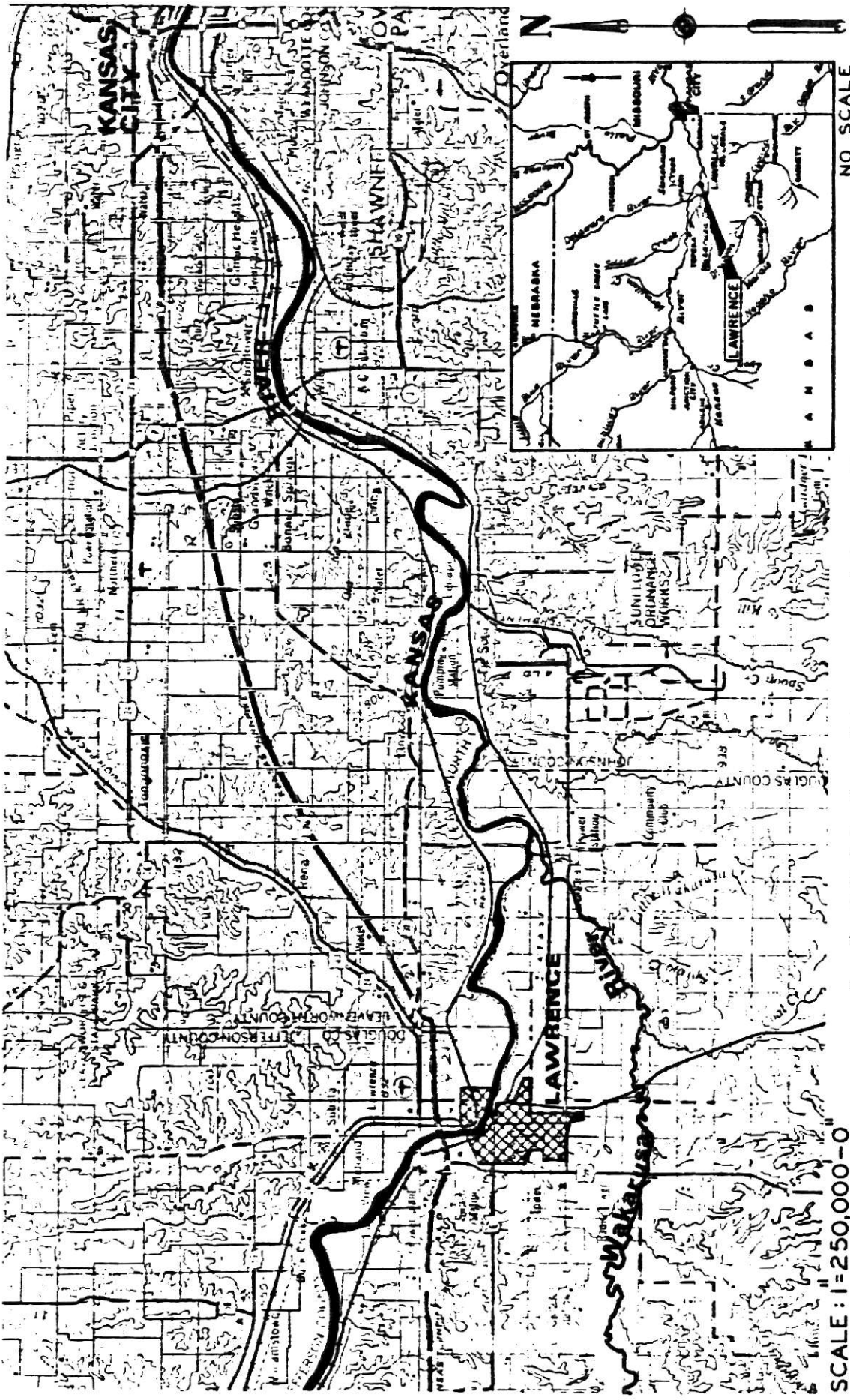
in the retail trade business categories and the unfavorable mix of low-wage occupations that are normally concentrated in retail trade.

Industry. Lawrence has a fairly sound industrial base consisting of approximately 50 businesses classified as manufacturing enterprises by the Lawrence Chamber of Commerce in 1976. The average number of employees per industry is approximately 70. The relative change by industry is crucial to even short-range forecasting techniques. Most of the change from 1960 to 1973 has occurred in the manufacturing (108.5%), trade (94.3%), and government (77.5%) sectors. All other sectors have remained stable in terms of the total number employed and have decreased in their percentage share of the economic base.

Flood Problems in Lawrence, Kansas ³⁴

Kansas River Flood History. The Kansas River is a mature, meandering stream (see Map 6). The course of the channel shifts back and forth between the valley walls in the geologic past. The Kansas River (also called the Kaw River) is formed by the junction of the Republican and Smoky Hill rivers at Junction City, Geary County, in the eastern part of the state. The direction of its course is generally easterly. It flows for about 170 miles east, through a rich agricultural section, passing Topeka, and empties into the Missouri River at Kansas City. The entire Kansas River basin is about 480 miles long and up to 140 miles wide with a total drainage area of 60,060 square miles.

The City of Lawrence, Kansas, is located along both banks of the Kansas River about 50 miles above the mouth. The settlement and development of Lawrence are, thus, closely related to the Kansas River, which in the pioneer days provided access by river transportation and today provides a valley with easy overland gradients, a water supply, and the other advantages of a riverfront city. But with these valley advantages there is, also, the flood hazard.



Map 6: U.S.G.S. Map of Lawrence and Kansas City

SCALE: 1"=250,000'-0"

NO SCALE

Much of Lawrence is on high ground and free of flooding from the Kansas River. However, a considerable developed area in the Kansas River flood plain, including all of North Lawrence on the left bank and a smaller area on the right bank, has suffered extensively from flooding in the past. The Wakarusa River and its tributaries have also flooded numerous times and could be a limiting factor in further development of the city in a southerly direction.

Newspaper accounts and historical records indicate a long history of serious flooding from the Kansas and Wakarusa River. The flood which occurred in July, 1951, with a peak discharge of 483,000 cubic feet per second, was the largest flood known since the great historical flood of 1844. Flood damage at Lawrence was estimated in excess of \$3 million, but fortunately, no lives were lost. Large floods were also experienced in July, 1957 and June, 1967.

Developments in the Flood Plain*. The flood plain of the Kansas River at Lawrence, Kansas, is from two to three miles wide. Elevations in south Lawrence range from about 1,021 feet west of the Court House to about 810 feet in the flood plain. In North Lawrence, flood plain elevations range from about 836 feet at the upstream end to about 800 feet near the mouth of Mud Creek, and to about 790 feet in the vicinity of Eudora, Kansas, at the confluence with the Wakarusa River.

Except for transportation and minor scattered developments in North Lawrence, most of the flood plain is presently devoted to agricultural or related purposes. A change in land use is already underway and the area is expected to become more urban, especially following completion of the levee system. A main line of the Atchison, Topeka and Santa Fe Railway essentially parallels the Kansas River on the right bank running east and west. The Union Pacific tracks enter the flood plain from the northeast on the left bank. The Kansas turnpike,

* "Flood plain" signifies the narrow areas of valley bottom land.

a four-lane elevated toll road, running east and west, crosses the flood plain of the Kansas River and Mud Creek just north of Lawrence on an elevated roadway.

A minor obstruction to streamflow of the Kansas River is the Bowersock Mill Dam just below the U.S. Highway 40-59 Bridge. During major floods, the dam acts as a submerged weir. It has been a subject of controversy for more than 60 years because of local opinion attributing flood damages to its existence. However, the constricting effects of the dam and the narrow reach just downstream are very minor with respect to the overall flood problem.

The North Lawrence Levee is 11.5 miles long and was constructed with 1V on 3H side slopes and a top width of 10 feet. The average height of the levee embankment is 15 feet north of Massachusetts Street Bridge, and 8 feet downstream on the bridge. The North Lawrence Levee unit was completed in 1972. The Mud Creek unit construction was scheduled to complete in 1978. Plans and specifications for the South Lawrence unit were submitted to Missouri River Division in June 1970. In a letter of June 1976 the city, however, has indicated it is no longer interested in proceeding with that portion of the project.

Future Floods and Possible Solutions. Floods greater than those of the past can occur. A study of storms and resulting floods occurring in the area surrounding Lawrence indicates that future floods could be significantly higher than past floods. Although it is conceivable that larger floods could occur, the largest flood can reasonably be expected in the future is represented by the Standard Project Flood (SPF).^{*} The SPF is in excess of the record July, 1951 flood on the Kansas River as modified by the existing and authorized reservoirs upstream. Hazardous conditions would exist in unprotected areas due to the great depths and high velocities of floodwaters. A more frequent flood, called the Intermediate Regional Flood (IRF), would also be dangerous, especially in

* SPF: Area subject to possible flooding by very large floods.

the Wakarusa River area where no protection is available. The flood would be about one foot higher than the flood of July, 1951 on the Wakarusa River and about 6 feet lower than the 1951 flood on the Kansas River. As a means of guiding wise development of the flood plain, the SPF, the IRF, and the levee system are presented in Figure 24.

The Federal levee system in conjunction with upstream reservoir control has already been accomplished. It will provide in excess of 100-year protection from flooding to the area downstream from U.S. Highway 40 Bridge south of the river and the land north of the river. Flood plain zoning regulations are now in effect in the City of Lawrence and in Douglas County. Through use of these regulations and information now available, a more clear appraisal of the flood hazard potential can be made.

These measures are not designed to prevent orderly development, but to avoid possible hazards to health, safety, and welfare of the general public. Regulations such as these are a practical and forward looking approach to wise development and to prevention of flood disasters.

However, protection of development already in the flood hazard area must also be considered. Corrective measures may include flood proofing to make existing structures less vulnerable to flood damage. This involves, but is not limited to, permanently closing lower openings, using flap gates on sewer openings, waterproofing walls and floors, installing removable bulkheads over entrances, and other changes.

Flood proofing is not in itself a cure for all flood problems. Rather it should be considered as one alternative among an array of available flood damage reduction measures, including land use regulation and change, flood control projects, flood fighting, flood relief, and flood insurance. A comprehensive flood plain management program generally involves the use of several of all of these techniques.

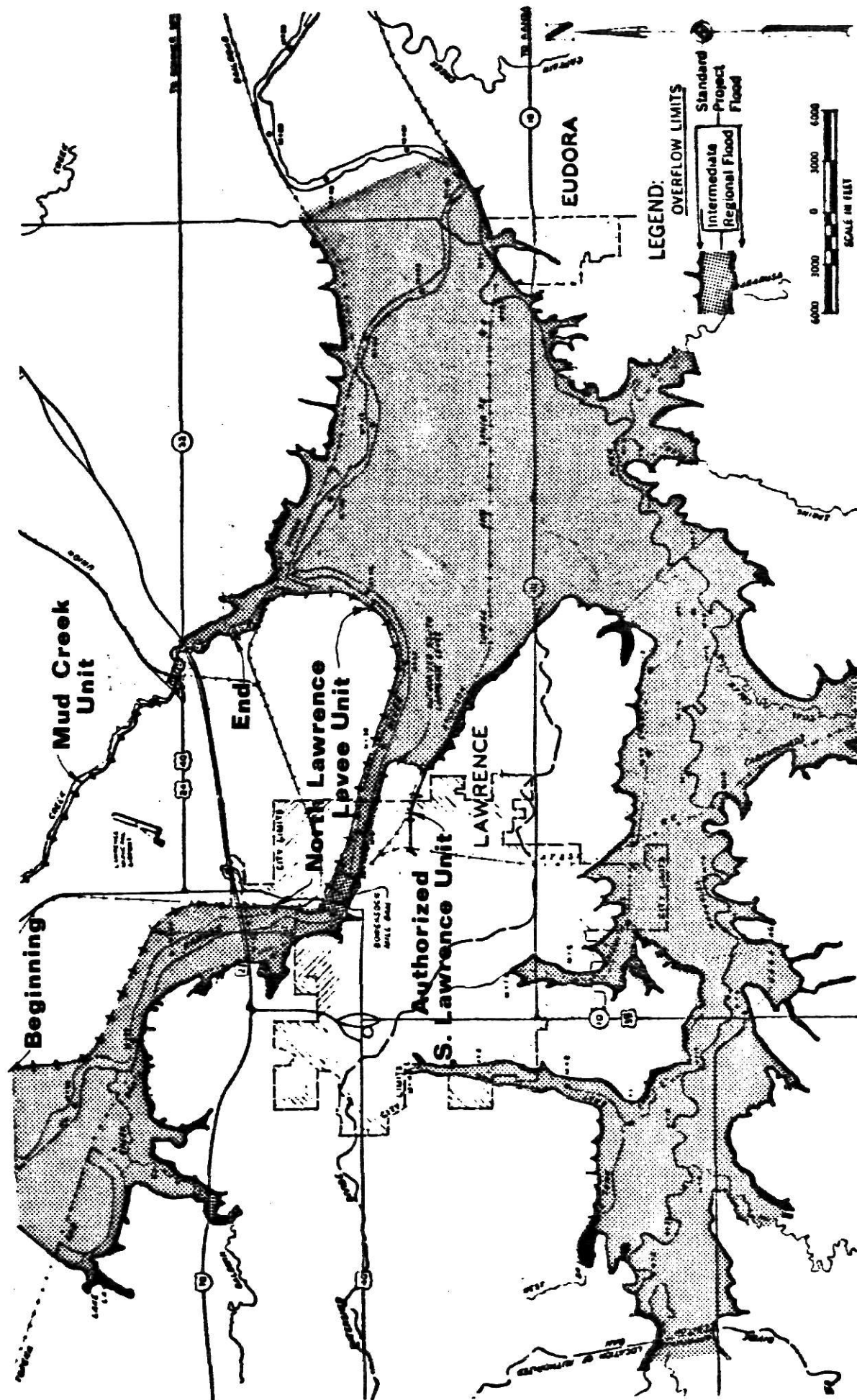


Figure 24: The S.P.F., I.R.F. and Levee System, Lawrence
(Source: 34)

LAWRENCE COMPREHENSIVE GUIDE PLAN '95

Planning Goals* for Lawrence³¹

Growth Goal. The community of Lawrence shall accommodate the market demand of growth through land use management based on the general public welfare and the carrying capacity of the environment.

Community Image and Identification Goals. An effort try to achieve and maintain an environment that nurtures a high level of community self-respect, pride, and confidence and that presents a pleasing image to residents as well as visitors or passers-by. One aspect of this goal shall be the preservation of historic sites, areas and structures.

Social Goals. Any developments should identify and provide for the special needs of children, the elderly, the handicapped, and the disadvantaged socio-economic groups in the Lawrence community, and encourage the participation of the citizens in community affairs.

Economic Goals. Economic goals shall encompass two distinct factors. First, it shall provide a strong employment base with sufficient potential for growth to provide employment opportunities in the broadest range of endeavor possible, without developing an imbalance in skills or community dependence on a single industry. Secondly, aspects of private and public development shall be such that they contribute to efficiency and economy in the fiscal affairs of the local government without unduly compromising safety, comfort, and aesthetic quality of facilities and services. For the individual citizen, economic aspects of development shall give primary concern to the buyer of lots and tracts.

Physical Goals. Development shall be based on sound ecological princi-

* "Goals" are community-wide statements of direction.

ples in order to provide for a clean, humane, safe, exciting and aesthetically pleasing environment for all citizens, with special attention devoted to the needs of children, the aged and the disadvantaged. The preservation of open space for conservation, recreation, surface drainage and other purposes is to be a priority consideration in development design whether public or private. Any environmental pollution that will endanger the health, welfare or enjoyment of the area is to be prevented.

Planning Constraints.

There are many planning constraints and impacts need be adjusted by implementing specific planning concepts and procedures, and also by accepting the constraint as it is and recognizing that these constraints provide the city with its unique character, image and quality of living environment.

A major physical constraint to development and urbanization is the Kansas and Wakarusa River floodplains. The broad floodplains of these two rivers provide rich farmlands but become obvious barriers to urban development. This forces directional growth patterns to the west which will continue to put the old traditional urban core and employment areas off-center. Transportation and travel patterns will tend to become less efficient in the future.

A second major physical constraint on development is the topography. Steep slopes and woodlands can be extremely attractive amenities. However, when land slopes exceed 15%, development can create numerous problems if not properly designed.

A third constraint is man-made features. Man-made features of the community such as the chemical plant east of the city will affect the future developability to the south. The result is that many acres of land, which otherwise would be available for some continued general urban growth east of the city, are now left with two land use alternatives: industry or agriculture. The potential for industry is limited because of the lack of rail access and because of the

spotty existence of land having a slope of less than 5% which is most suitable for extensive industrial development. It will take careful planning to keep the eastern gateway to the city from becoming a bad visual detraction and improve some of the problems that currently exist.

A fourth major constraint is the Mount Oread-Kansas University area. The primary problem relates to the development of adequate east-west corridors for vehicular traffic without disrupting the neighborhoods.

The Kansas Turnpike, the Clinton Reservoir, and the railroad and highway networks, also, need be considered.

General Land-use Guide Plan

The most striking features of the Lawrence land use pattern are the off-center location of the central business district (CBD) and the broad expanses of the University of Kansas and Haskell Indian Junior College.

Land use guide plan '95, is based on a "managed growth" approach which will consider massive "boom" growth as undesirable and yet will attempt to provide a proper environment for and support steady, quality growth for the Lawrence area.

The maintenance and revitalization of the older neighborhood should serve to conserve energy, make more efficient use of existing public facilities, limit future capital expenditures as much as practical, limit unplanned suburban sprawl and reduce the potential for the spread of blight and urban decay.

The primary direction of growth and development will, for the most part, tend to continue in the traditional westerly pattern with increased emphasis toward the southwest. The plan proposal recommends that the city make every possible effort to encourage growth and development to the east and northwest, with the intent of keeping the overall growth as directionally balanced as possible.

Urban growth is not encouraged into or beyond the flood plain except in

North Lawrence. In addition, land use planning criteria have been based, in part, on trying to maintain a gross density of three living units per gross developed acre through the 1995 planning period.

REDEVELOPMENT CONSIDERATIONS

Goals

1. Take advantage of the unique asset of the Kansas River to develop a viable, economically stable, and aesthetically attractive urban riverfront.
2. Remove incompatible uses and re-direct community interest to focus on the riverfront.
3. Improving surface water quality - Reduction and eventual elimination of pollution should be a foremost consideration,

Objectives*

Physical:

1. Encourage new development in strategic locations along the river frontage that would provide activities and access to the public.
2. Realize the full potential of the river and provide a delight and diversity environment.

Aesthetic:

1. Visual access - develop the views of all riverfront functions.
2. Enhance visual quality of man-made and natural environment.

General Guidelines**

The following guidelines are identified as significant elements or

* "Objectives" are specific steps for attainment of goals,

** "Guidelines" are general and routine approaches for day by day planning.

factors, which should be part of the input into Lawrence riverfront redevelopment.

Sense of Place and Continuity. The good riverfront design should strengthen the city dweller's and visitor's sense of place and sense of continuity, thus giving a shape to his image of the city. Some of the ways a riverfront can be redesigned to create a sense of place are: preserving historical buildings, retaining the maximum amount of openness that provide good views of riverfront activity, and imaginative architectural design which contribute to the individuality. Also, by increasing its accessibility or use, the riverfront will be an integral part of the urban dweller's life and daily experience.

Blend the New and the Old Structures. Many old structures have a special character, although they are often in need of rehabilitation. Thus structures with special architectural significance can serve as a design lodestone for new buildings and new use for the area. They can give the new structures a greater sense of continuity and conserving the community's heritage for its residents

Broad Open Space Within Urban Environment. As urban expansion gobbles up land, cities need open space for fresh air and sunlight, to beautify the environment of everyday living, and to provide recreation. These areas are expensive to provide, but Lawrence has a natural open space available - the surface of the river itself.

By lining the banks with landscaped parks, the buffer effect of the river is increased. The number of buildings and the number of people - with visual access to the water is much greater. Rather than allowing the riverfront to be lined with a solid phalanx of buildings, intervals should be created to provide inland points with visual access to the river. Landscaped malls and broad boulevards provide the visual links to inland points. Also, open space should be easily accessible physically. Pedestrians and motorists should find the open space area within easy reach - a few minutes from their home or office.

New Buildings Out of Flood Plain. Attitudes differ throughout the country about whether building should be kept out of areas prone to flooding, or whether flood protection works should be constructed. A reasonable policy in Lawrence would keep new buildings out of flood plain.

TODAY'S LAWRENCE RIVERFRONT

Figure 25 shows existing land-use plan, Lawrence Riverfront Region.

Figure 26 shows zoning map on Lawrence Riverfront Region.

Figure 27 shows visual survey on Lawrence Riverfront Region

Figure 28 shows existing building conditions, Lawrence Riverfront Region.

Figure 29 shows existing nice buildings, Lawrence.

IMPROVEMENT PROGRAM IN EACH STUDY AREA

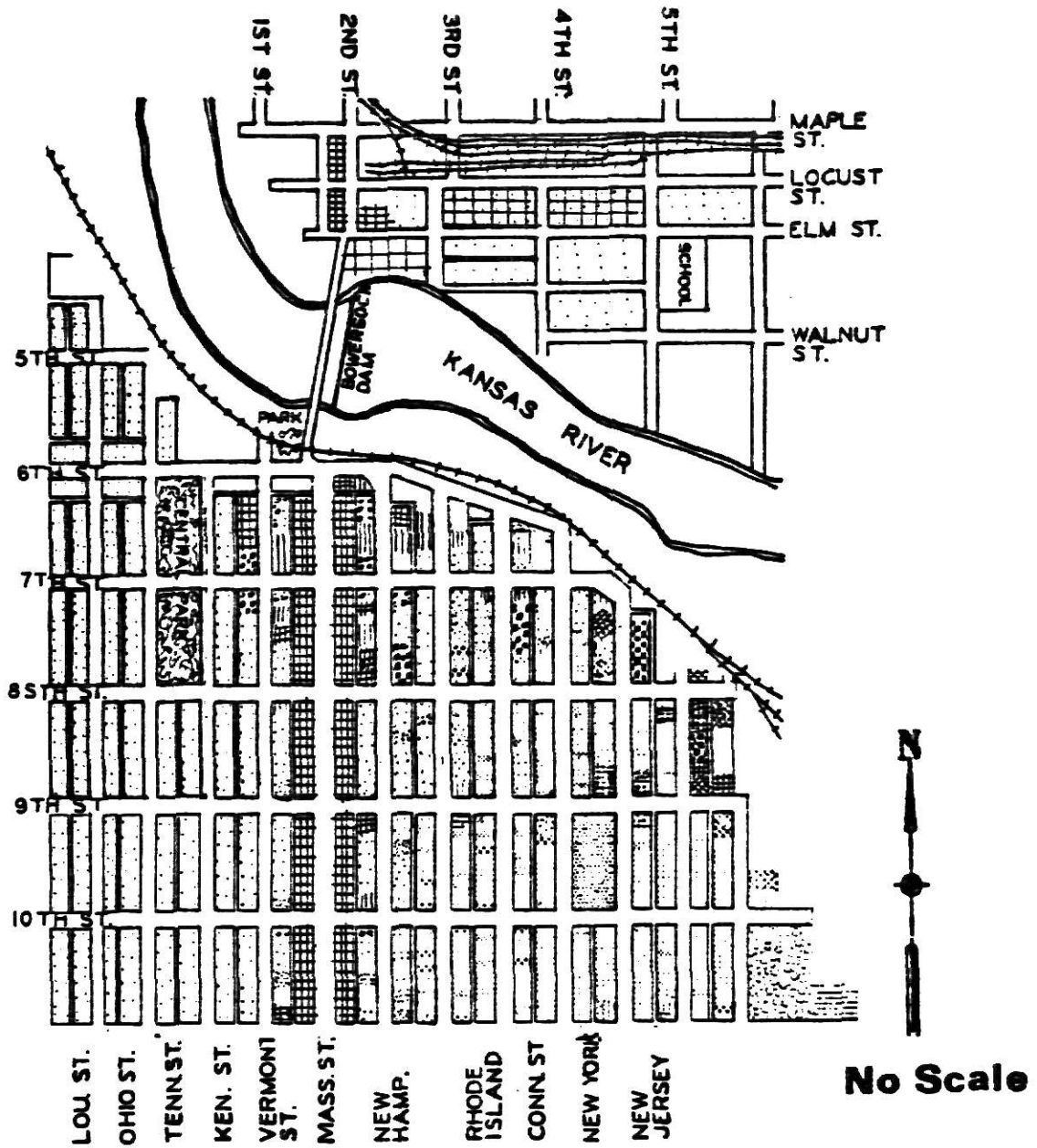
The Study areas, shown on Figure 30, are defined by a number of existing conditions along the extent of the urban riverfront.

Although land uses now surrounding Kansas River have not been developed as part of the central business district (C.B.D.), the potential for riverfront redevelopment need to be defined.

Study Area Number One: North Entrance to C.B.D. (See Figure 31)

Site Analysis. The first impression one receives as one approaches a town often becomes a lasting impression of a community's character.

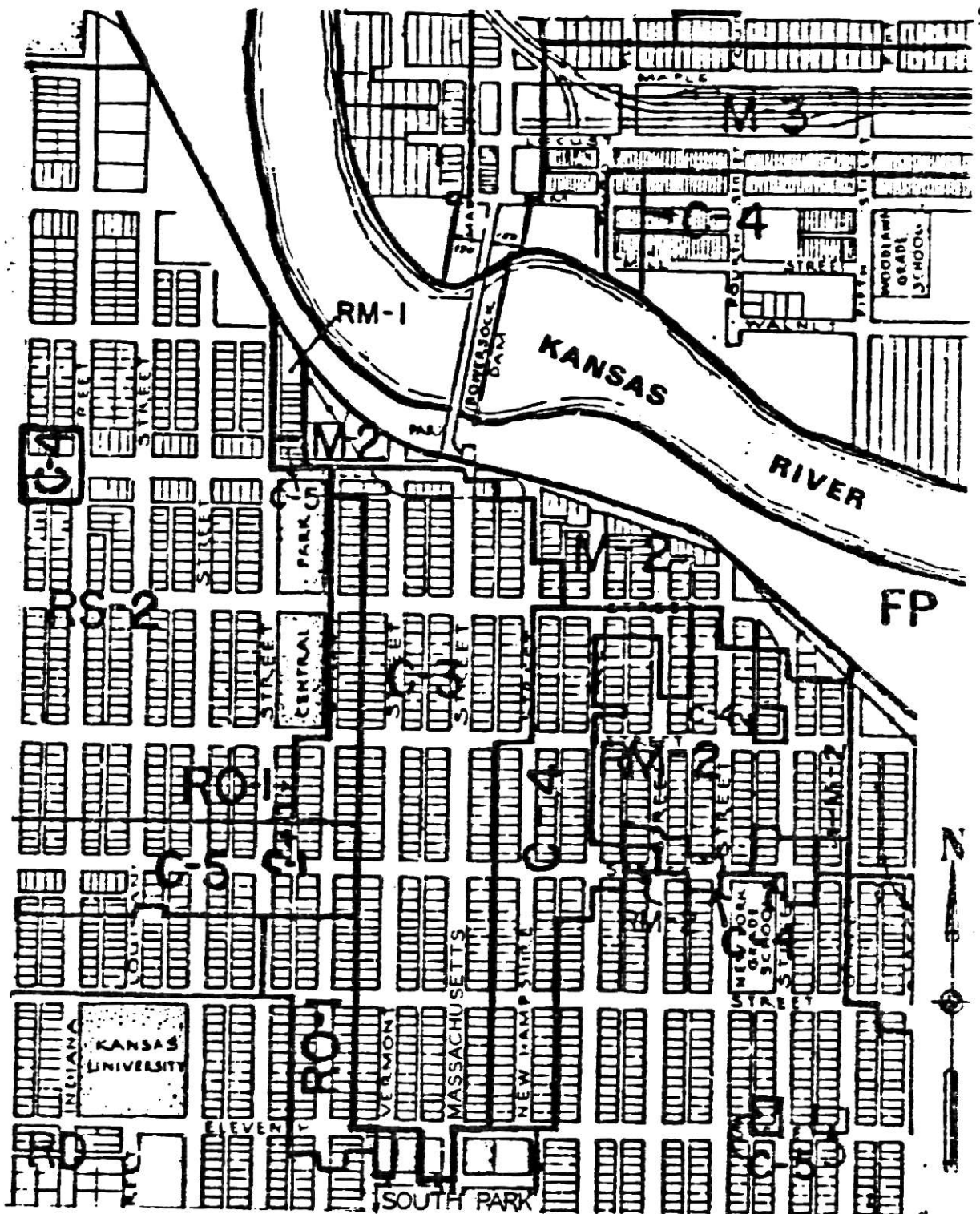
The entry to the city through North Lawrence is a mixture of land uses of deterioration conditions (See Figure 32). Due in part to its physiographic separation by the river from the major bulk of the area which comprises Lawrence, the commercial strip along North 2nd Street (Highways 59, 24, and 40) has considerable local identity and spirit. There is an extreme intermixing of industry, highway-oriented commercial usage, some neighborhood commercial, and residential use. The lack of a clean definition between highway edge, yard or parking areas,



LEGEND

	LOW DENSITY RESIDENTIAL		PARKING
	MEDIUM DENSITY RESIDENTIAL		PUBLIC
	HIGH DENSITY RESIDENTIAL		PARKS
	RETAIL		INDUSTRY
	WHOLESALE		SCHOOLS

Figure 25: Existing Land-use Plan, Lawrence Riverfront Region (Source: 42)



LEGEND :

RESIDENTIAL

- RS-2 SINGLE FAMILY
- RM-1 MULTIPLE FAMILY
- RM-2 MULTIPLE FAMILY
- RO-1 RESIDENCE-OFFICE

COMMERCIAL

- C-3 CENTRAL
- C-4 GENERAL
- C-5 LIMITED

INDUSTRIAL

- M-2 GENERAL
- M-3 INTENSIVE

Figure 26: Zoning Map on Lawrence Riverfront Region
(Revised in August 6, 1979)

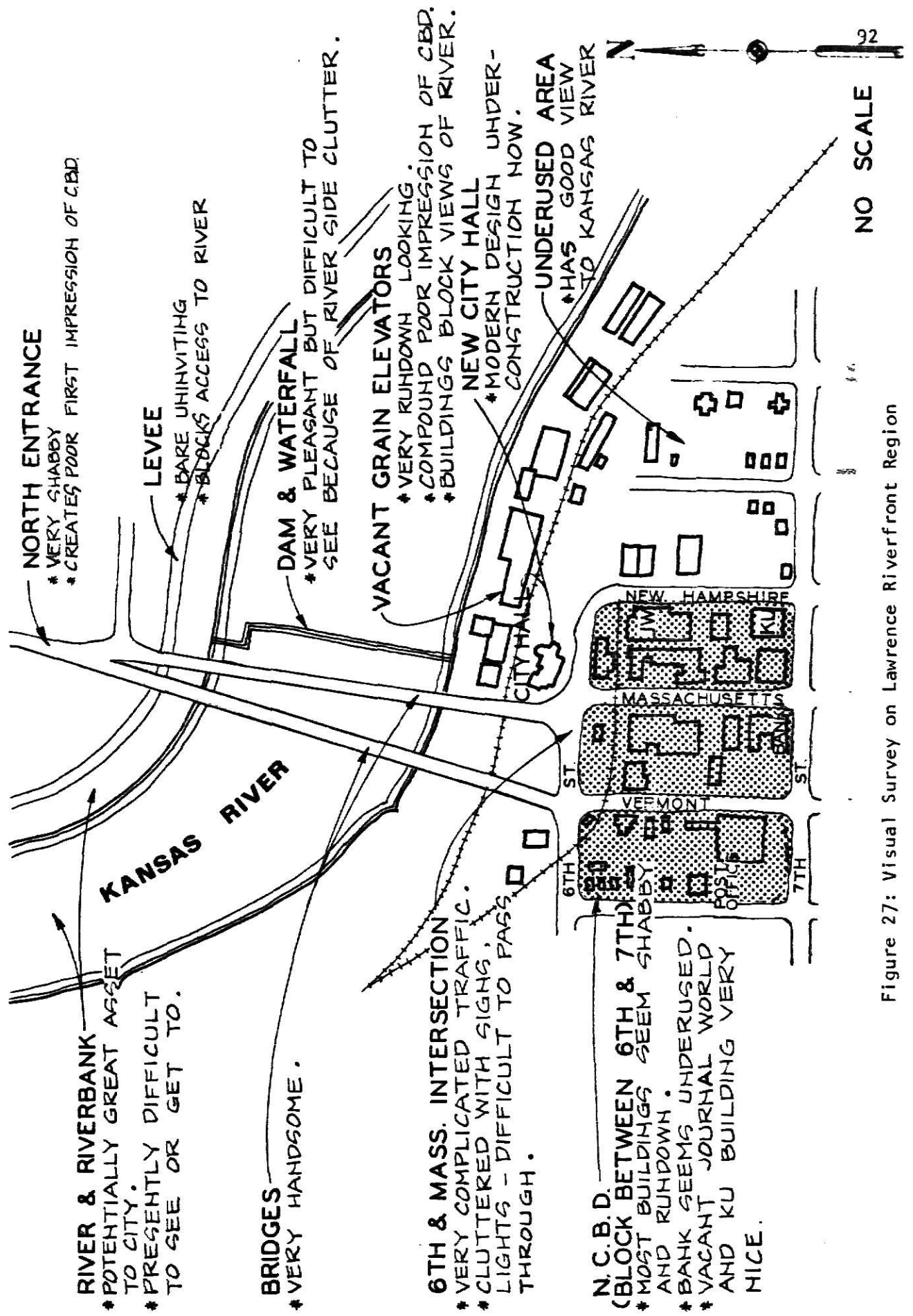
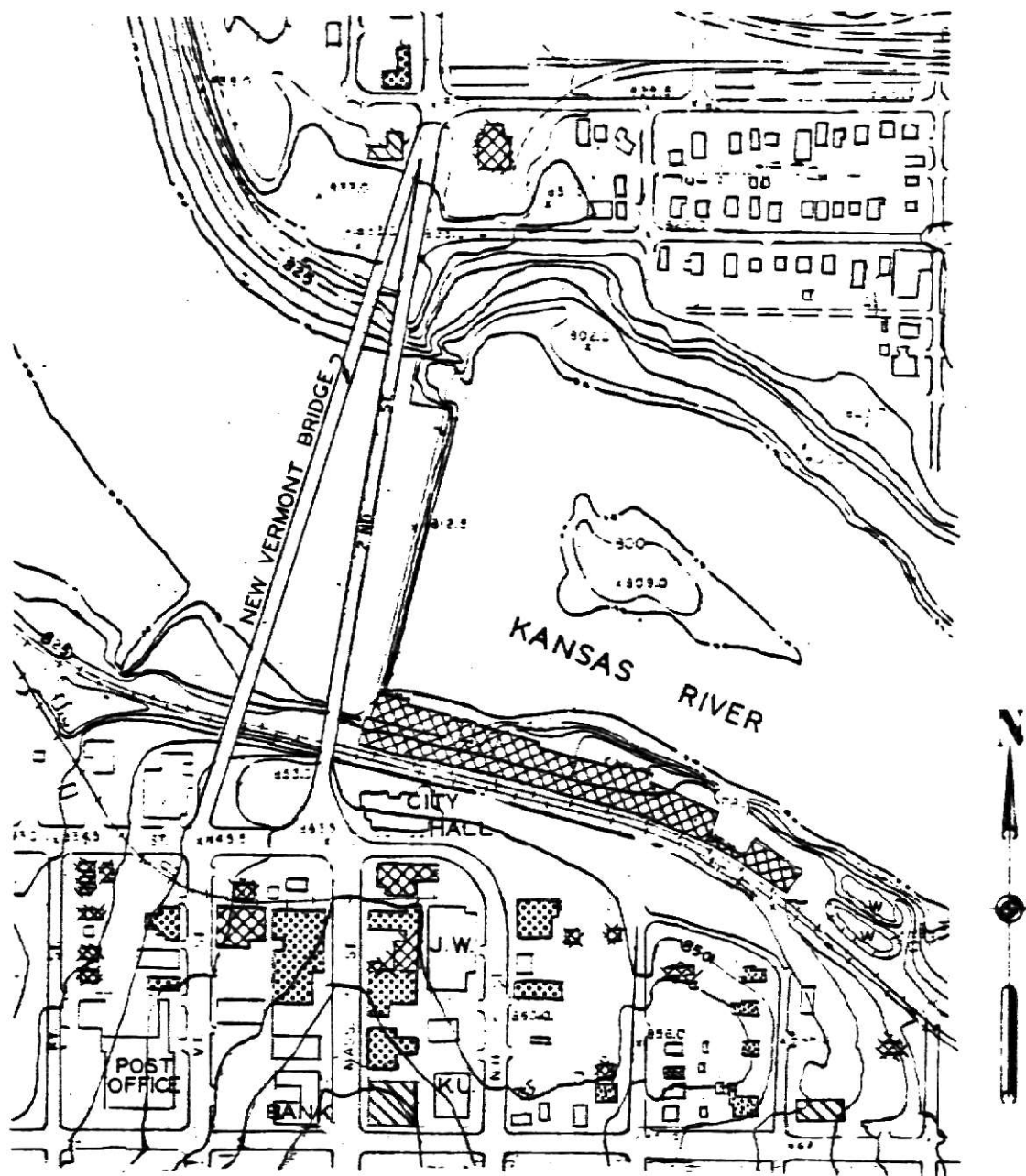


Figure 27: Visual Survey on Lawrence Riverfront Region



LEGEND





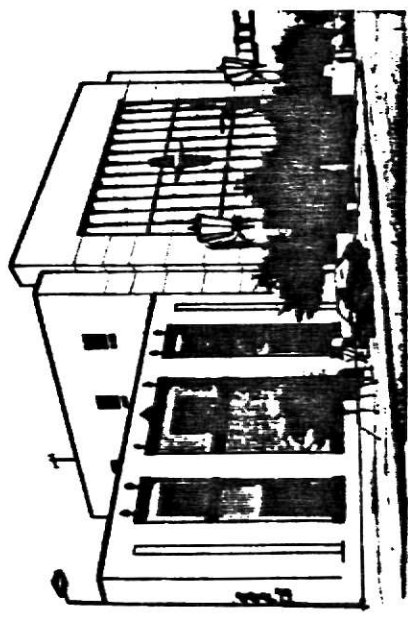
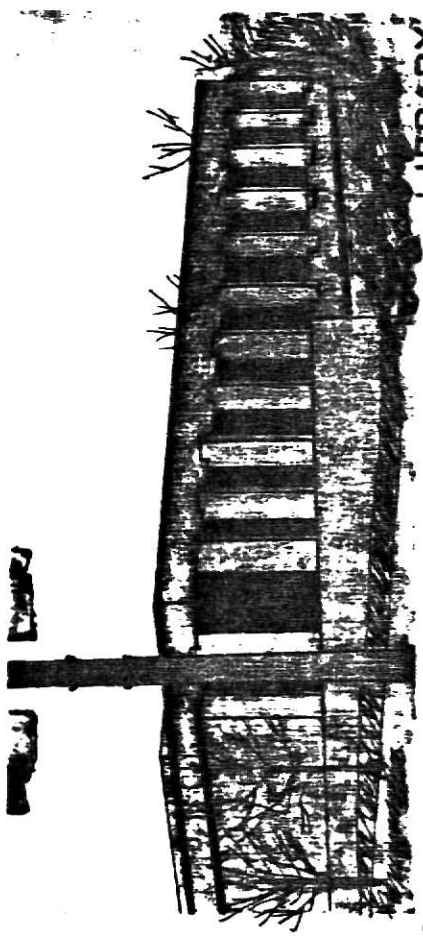
-  MAINTAINED
-  MINOR RENOVATION
-  MODERATE RENOVATION
-  MAJOR RENOVATION / DEMOLITION

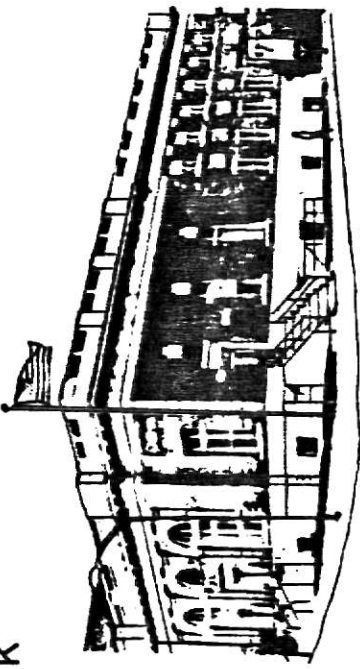
Figure 28: Existing Building Conditions, Lawrence Riverfront Region (Source: 39)



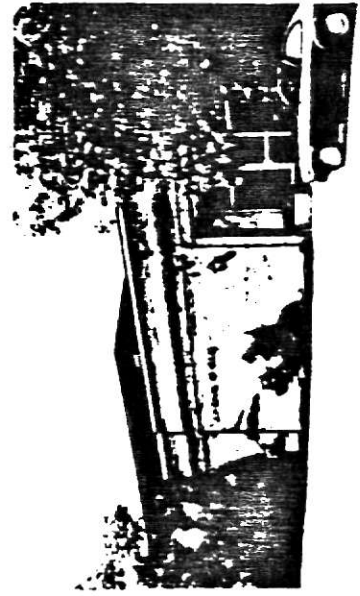
LAWRENCE NATIONAL BANK



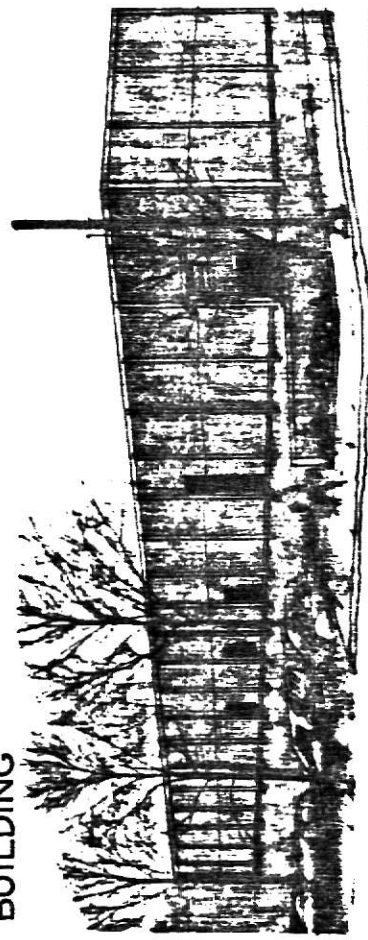
LIBRARY



K. U. BUILDING

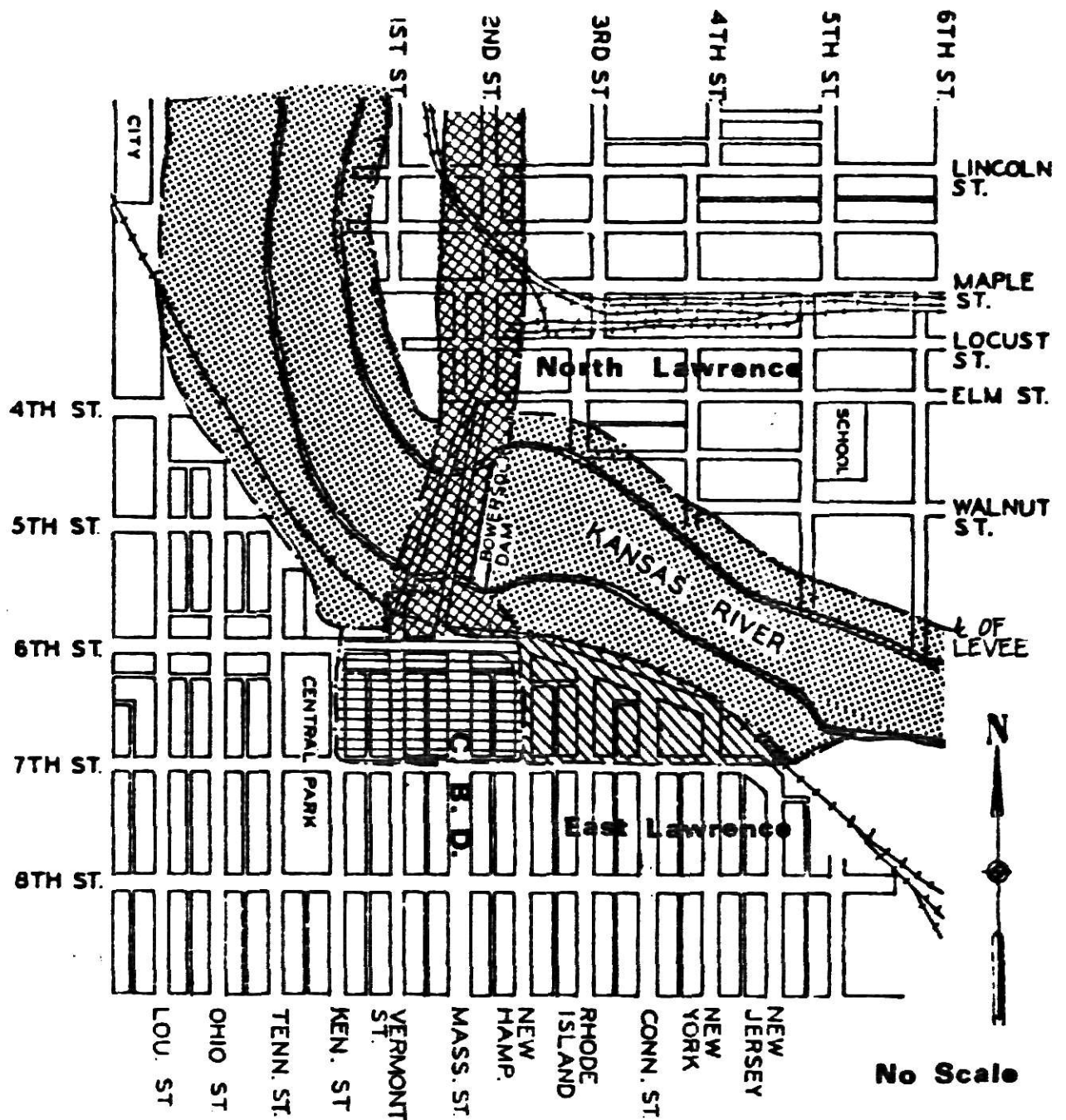


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Figure 29: Existing Nice Buildings, Lawrence



LEGEND :



Study Area One
NORTH ENTRANCE TO C.B.D.



Study Area Two
NORTH C.B.D.



Study Area Three
H. PART OF EAST LAWRENCE



Study Area Four
FLOOD PLAIN & KANSAS RIVER

Figure 30: Key Map for Study Areas on Lawrence Riverfront Region

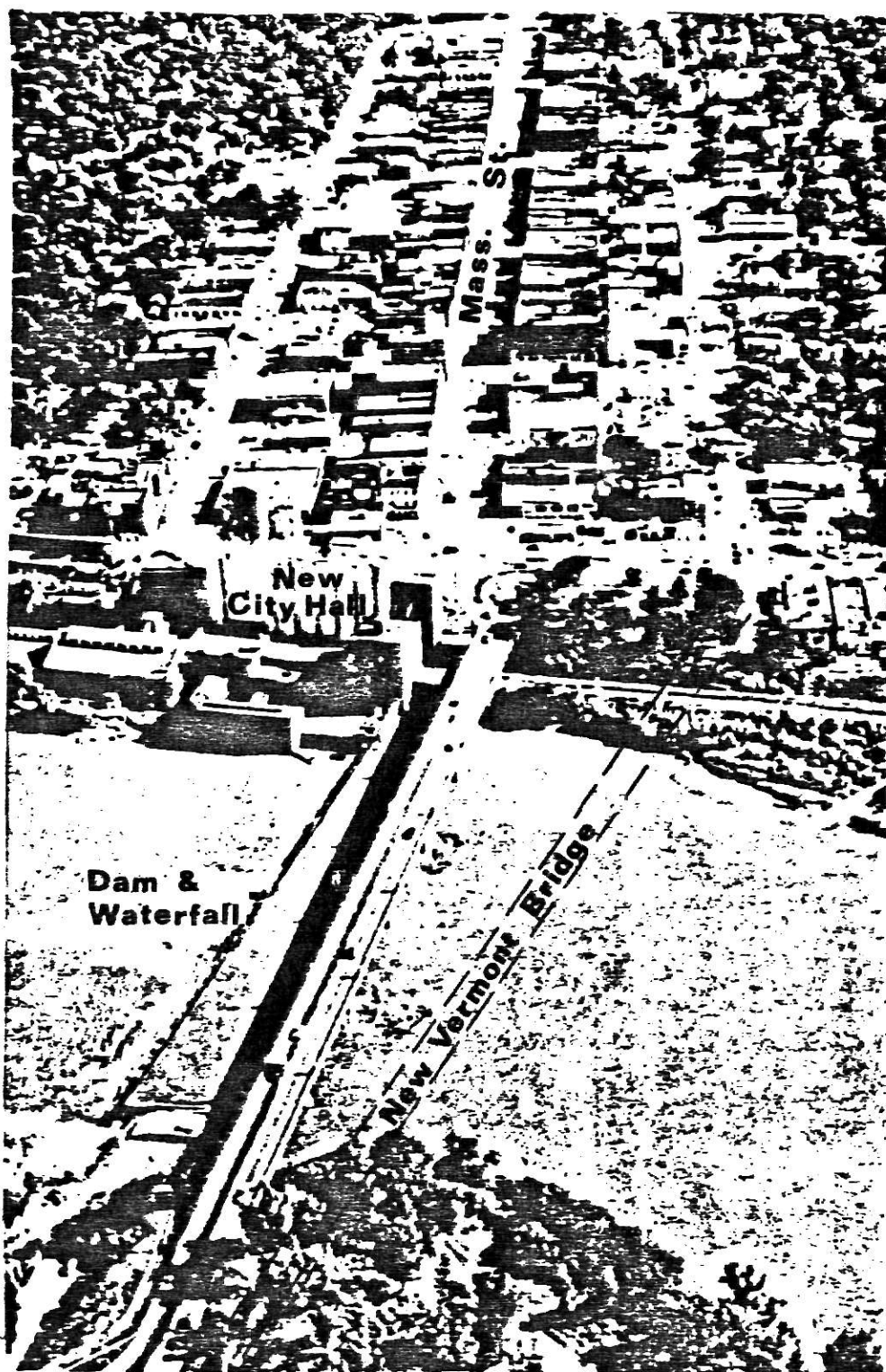
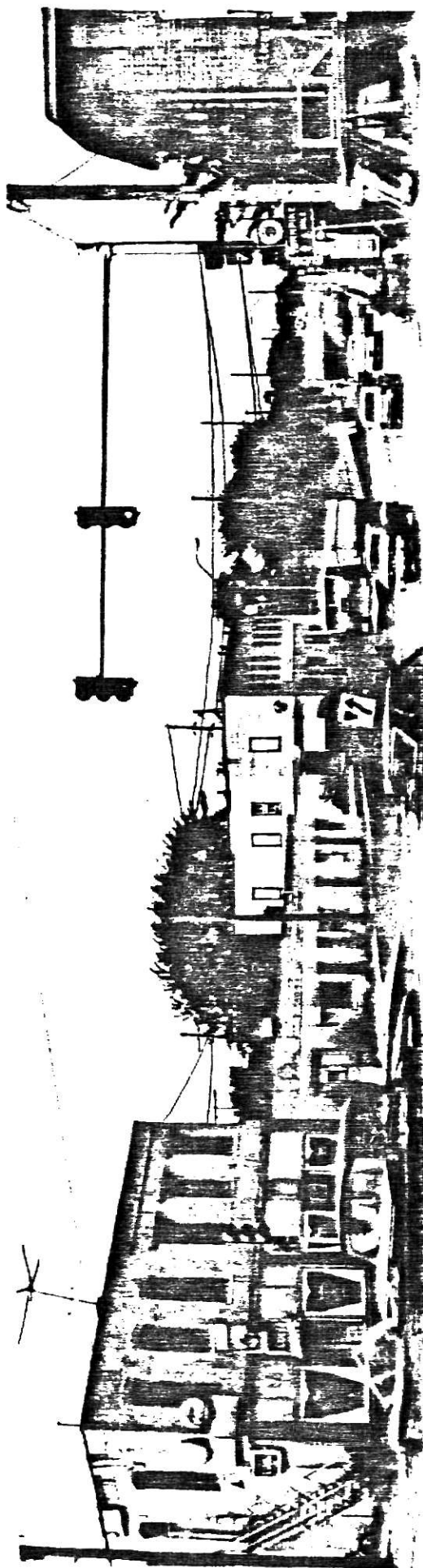
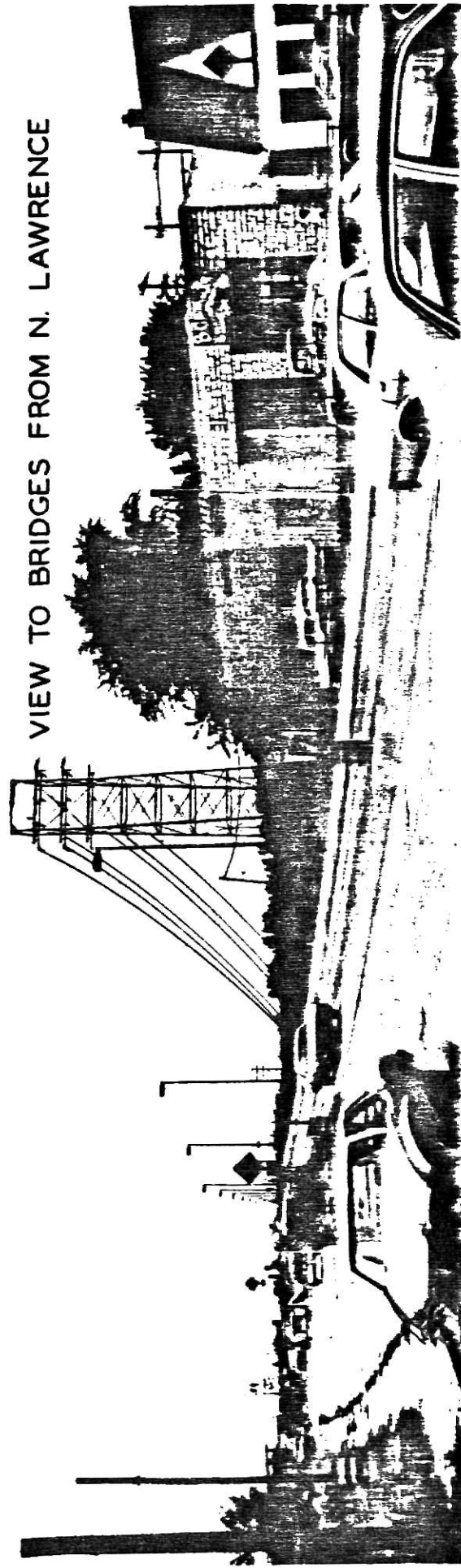


Figure 31: North Entrance to C.B.D., Lawrence
(Source: 35)



VIEW TO N. 2ND. ST.



VIEW TO BRIDGES FROM N. LAWRENCE

Figure 32: Streetscape in North Lawrence

driveways, sign locations or building setbacks creates moments of visual chaos. The range of structural age and character, the unpaved drives and parking surfaces add to the overall negative impression of both the North Lawrence residential district and the community of Lawrence.³¹

The existing bridge is presently being replaced by two bridges called the Vermont-Massachusetts Street Bridges (See Figure 33). These handsome arched structures serve as gateway to CBD and tie between North Lawrence and the rest of Lawrence. The old one need structural repair.

The one acre open space, situated between the two bridge spans at 6th and Massachusetts will be named "Robinson Park" in honor of Charles Robinson (first Governor of Kansas). This historical park will provide the opportunity for making the entry area an exciting and attractive place.³⁵

There is a great deal of potential at the end of the bridge, the intersection to convey a very positive image but this potential has been relatively untouched.

Need. All entry experiences have several basic elements: (1) the "announcement" or the observer's first impression. This instantaneous view or glimpse must be well planned in order to succeed. (2) At the entry gateway the observer has made the transition from "not being there" to "being there". The design of a gateway must depend upon its distance from the city, on topography, and on the velocity of entry or exit. (3) Nodes are focal points or activity centers within a city. New development can increase or decrease the intensity of activity at a node or shift the node to a new location. (4) Channels or links are routes, approaches, walkways or passageways that connect activity centers.³⁶

A city and its C.B.D. may be perceived as a series of personal experiences. The city's image can then be viewed as a sequence of events or experiences, with each individual experience contributing to the total image. In analyzing the image of a town like Lawrence, it is more helpful to focus upon

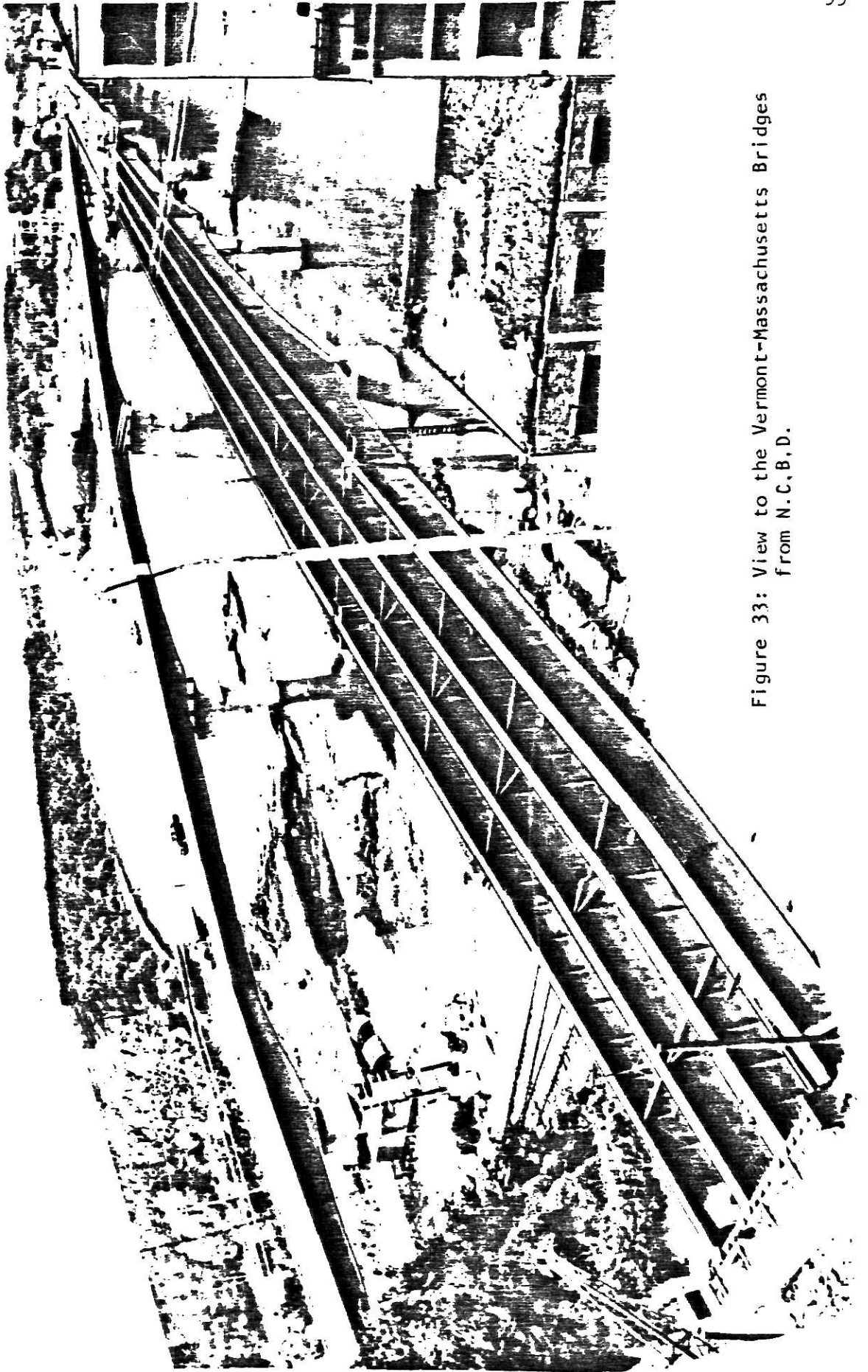


Figure 33: View to the Vermont-Massachusetts Bridges
from N.C.B., D.

individual elements (emphasize the positive and correct the weakness) that interrelate to form the overall experience.

As a driver continues from Kansas Turnpike to Lawrence downtown, the path is framed by an underpass, a distinct gateway to the city, with undeveloped potential. As the path descends, the grain towers disappear from view but again reappear as one emerges from the underpass, still leading towards the commercial center. Suddenly as the path crests, there is a final statement that one has arrived, as the path over the new bridge offering an elevated view of the Kansas River, the grain elevators, the new city hall, and buildings in C.B.D.. At the end of the bridge the neglected old mill and billboards are offset by a monument that welcomes the driver to the "Town Center".

A driver's ability to direct and orient himself to the continuity is often dependent on the design of intersections. The visual quality and the traffic capacity of intersections can affect one's image of the city in a positive or negative manner. The new city hall dominates the northeast corner of 6th and Massachusetts intersection. Special attention should be given to the Vermont and 6th intersection.

Design Concept:

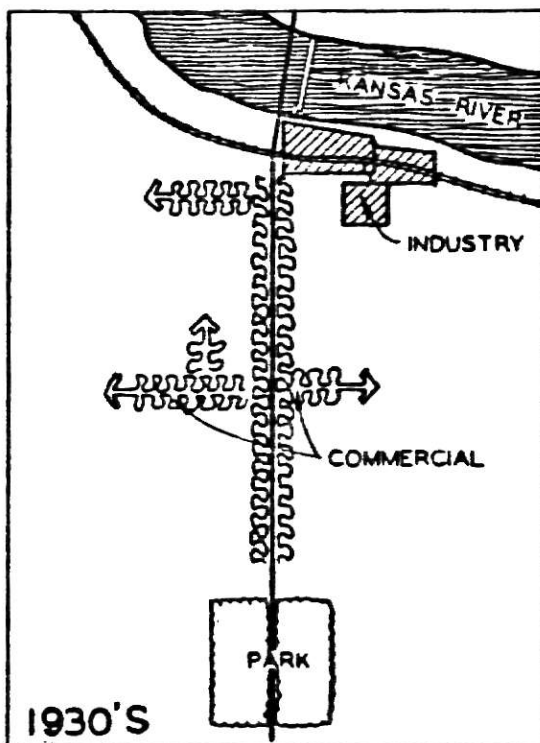
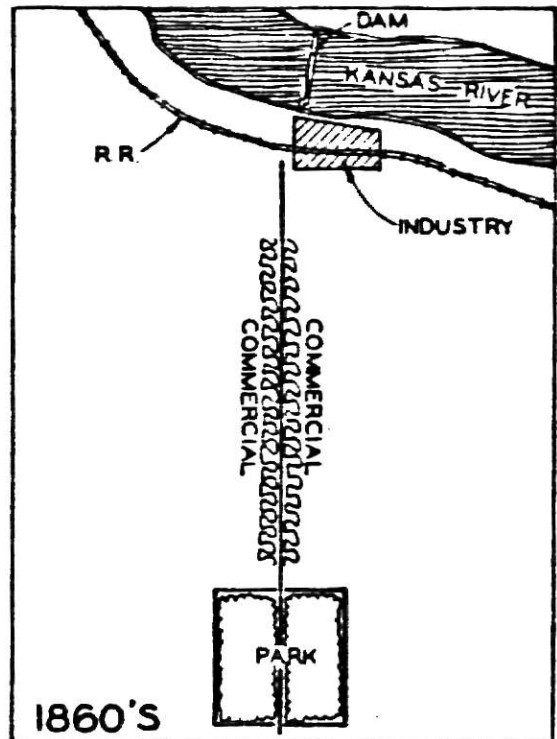
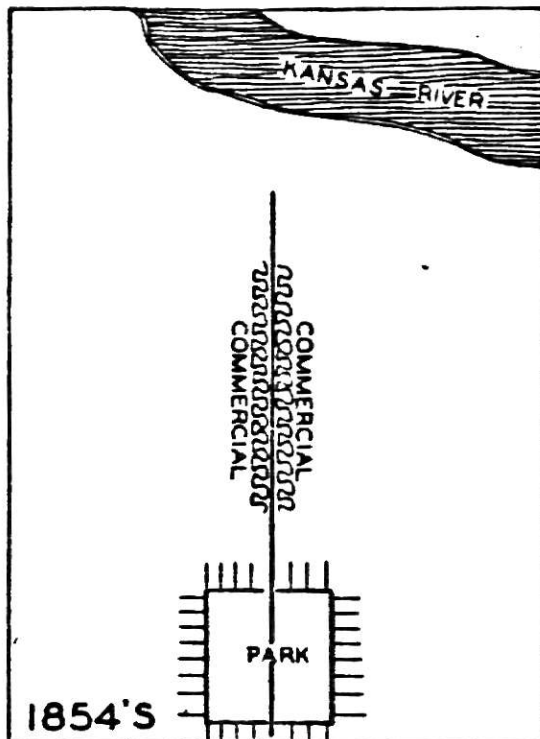
1. Creating better physical and social relationships between North Lawrence, C.B.D. and the rest of Lawrence.
2. Developing the river side area or a new riverfront center would create new nodes for Lawrence.
3. The unsightly structures at the south end of the bridges should be cleared or upgraded considerably.
4. Intersections of 6th & Massachusetts and 6th & Vermont - develop as entry gateways to C.B.D.
5. Creating a small entry park at the south end of bridges.

Study Area Number Two: North Central Business District (N.C.B.D.)

Site Analysis. The Central Business District (C.B.D.), located primarily on Massachusetts Street from 6th to 11th Street, has served in this capacity since early settlement. It terminates on the south with the historic Walkins Museum and County Courthouse and is further contained by the open space of South Park. The image shown on Figure 34 and Figure 35 will help to understand the development history and character of the retail segment of the C.B.D.³⁷ From 13th to 19th Street, trees and older residential structures line Massachusetts Street. The character changes to a fairly intensive commercial center at 19th Street. Then the residential character is again dominant until 23rd Street. The rhythm of this sequence is good and the basic land uses should be maintained.

Although Lawrence's C.B.D. suffers from competition with outlying commercial facilities, as well as the proximity of large regional shopping centers in Kansas City and Topeka, there exists a healthy atmosphere in which local merchants and businessmen as well as the city fathers are striving to revitalize Massachusetts Street and contiguous streets. In the recently redeveloped C.B.D. area, the vitality of the central city is reinforced by renovated and refurbished establishments as well as overall landscaping treatment. It is in the unique position of being able to serve more people with a greater variety of facilities than any other location in Lawrence.

However, in N.C.B.D., there is a lack of building maintainance, sign control, parking area landscaping, and the inherent problem of open storage of materials. Most of existing commercial buildings are vacant, under-used, unsound. (See Figure 36) In fact, the three block area appears very deteriorated and need to be conservated. Existing circulation and available parking spaces in N.C.B.D. are shown in Figure 37,



NOTES

1854 FOUNDRING: VERY WELL ORGANIZED ALONG MASS. ST. GOOD RELATION WITH RIVER.

1860'S: INDUSTRY BEGINS TO BLOCK CITY FROM RIVER.

1930'S: INDUSTRY SPREADS. COMMERCIAL EXPANDS INTO RESIDENTIAL AREAS. PARKING BECOMES A PROBLEM.

Figure 34: Development History of C.B.D., Lawrence
(Source: 39)

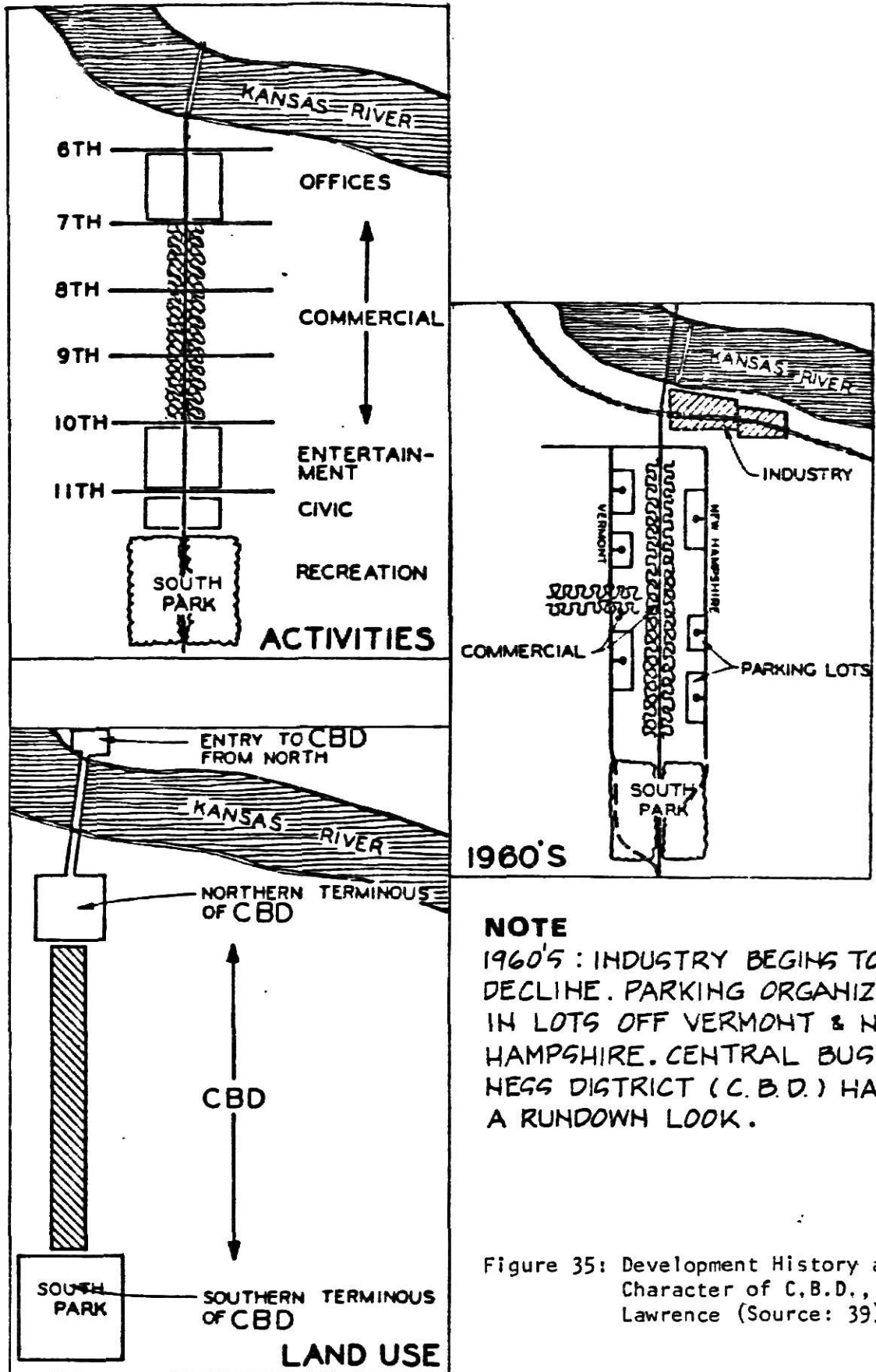


Figure 35: Development History and Character of C.B.D., Lawrence (Source: 39)

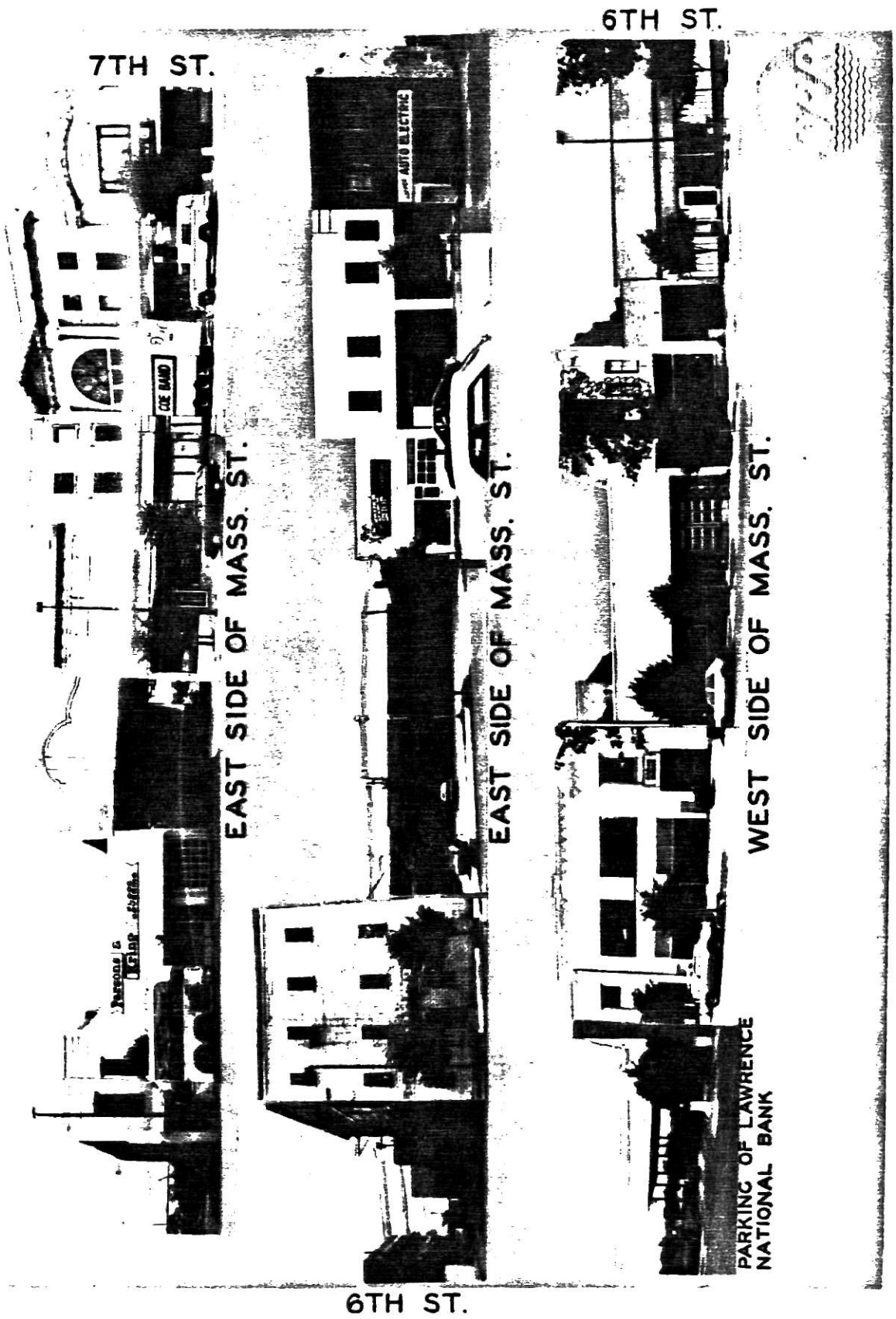
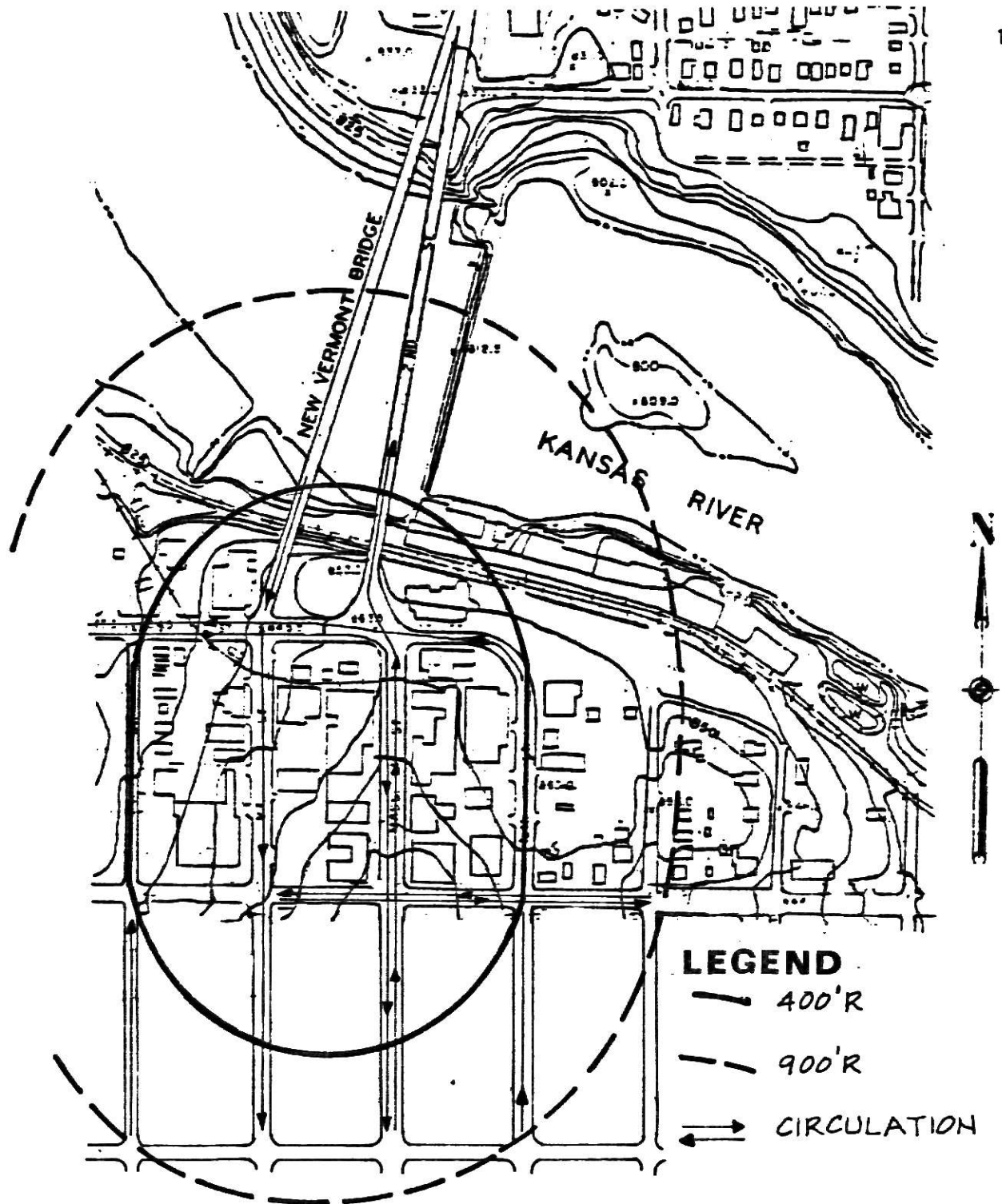


Figure 36: Streetscape in N.C.B.D., Lawrence



NOTES

PARKING WITHIN 400' R	
OFF-STREET	166
a. PRIVATE	138
b. PUBLIC	28
ON STREET	

PARKING WITHIN 900' R	
OFF-STREET	427
a. PRIVATE	154
b. PUBLIC	273
ON STREET	

Figure 37: Existing Circulation and Available Parking Spaces in N.C.B.D., Lawrence (Resource: 39)

Need. Area conservation has been recognized as an asset to planning -
 not a "necessary evil".³⁸ The dictionary states that to conserve means "to keep
 from being damaged, lost or wasted...". In architectural phase, the conserva-
 tion involves the modernization of mechanical and structural elements, including
 alterations necessary to extend the useful life of the building or facility. The
 architectural character and integrity of the exterior should be retained. With
 conservation, there is no requirement to expend much effort to achieve strict
 historical accuracy or to precisely recreate the original construction.

In general, the townscape approach* is an effective effort than the reno-
 vation of a single outstanding property for conserving an area. It is concen-
 trating on environmental amenities that add value to an entire area, and thus in-
 crease the potential for private investment and stimulate the renovation of in-
 dividual properties.³⁹

The suggested conservation has four basic facets: (1) remodeling or
 replacement of existing buildings; (2) careful architectural treatment of new
 buildings; (3) control of outdoor advertising; and (4) landscaping and improve-
 ment of parking areas and open spaces.

Design Concept:

1. Existing buildings of architectural value are rehabilitated; deteri-
 orated buildings are cleared for new riverfront center and new con-
 vention center sites.

* The townscape process attempts to recover and enhance architectural character, increase pedestrian circulation and enjoyment and add or improve street furniture, lighting, landscaping and graphics. It is based on the assumption that the shapes, textures and spaces of the built environment can yield both aes-
 thetic and economic benefits through orchestrated physical improvements.³⁹

2. In Lawrence, there are no learning opportunities for high school graduates who do not go on to colleges and universities.⁸ It is necessary to choose a site for vocational training center serving the city.
3. New buildings should continue the established proportion, scale and rhythm. The architectural treatment will be similar to that of the new city hall. (See Figure 38)
4. Improvement of the "streetscape" - promote increased pedestrian use and enjoyment; develop a lighting system to give clear direction to the motorist as well as to the pedestrian; landscaping separates and defines various uses, entranceways and circulation corridors, encourage double rows of street trees along Massachusetts St. in a planting strip adjacent to the curb; provide street furnitures to increase pedestrian conveniences; use different paving materials and patterns to define spaces.
5. Encourage store owners and proprietors to relate improvements of their storefronts to the streetscape and to pedestrian activities.
6. Avoid traffic thru Massachusetts Street. Improve traffic flow at intersection of 6th and Massachusetts Street. A substreet pedestrian crossing is a much needed element between riverfront and C.B.D. linkage because of the heavy traffic on 6th Street.
7. Develop a consistent signage system - including the size, color, style, location - to enhance building character and clarify the information.
8. The open spaces and public right-of-ways should be treated as major unifying features.
9. Parking areas provide land for future expansion. It will be a synthesis of below surface or above surface.
10. Reconstruct and beautify sidewalk.

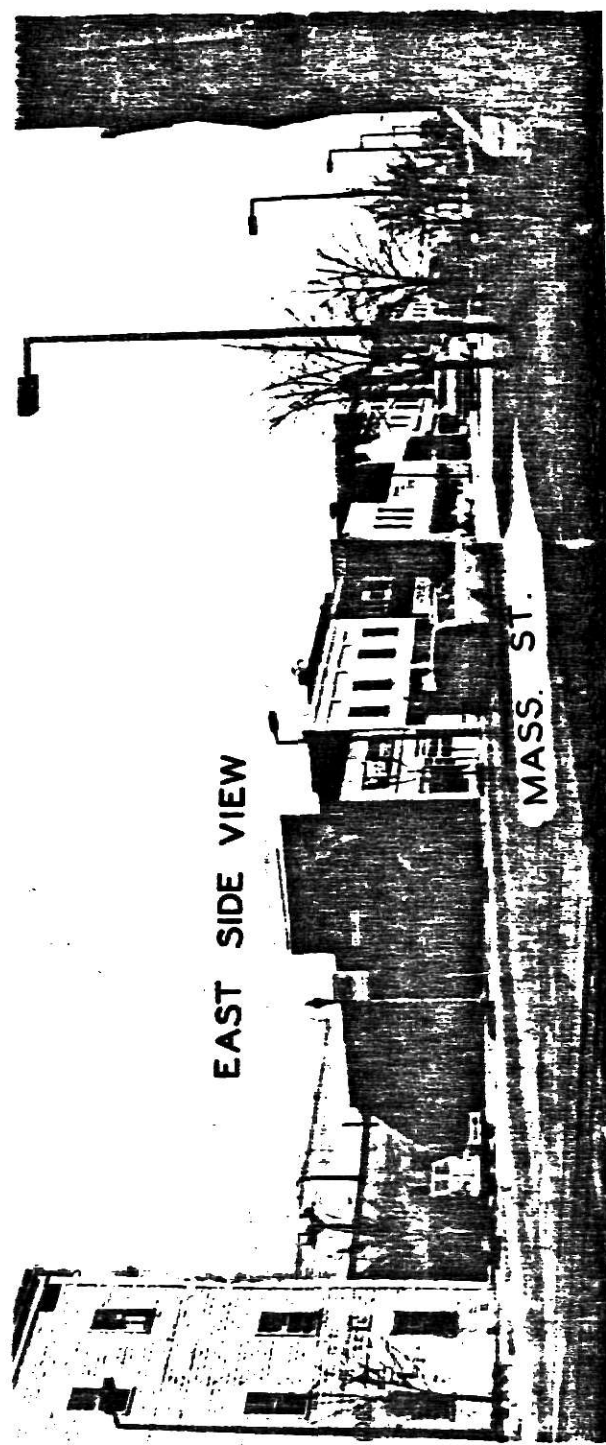


Figure 38: Existing Scene of N.C.B.D., Lawrence

Study Area Number Three: North Part of East Lawrence

Site Analysis.⁴⁰ East Lawrence is a neighborhood with a mixed land uses that is almost completely developed. Past city plans designated large areas along the railroad tracks for industrial development. As a result, the northeastern edge of the neighborhood is presently used for various industrial purposes.

The residential portions of the neighborhood are mostly occupied by older housing. (See Figure 39) Many have extensive structural problems, and a small percentage cannot be rehabilitated economically. The present population consists of a large percentage of young and over 65 age groups, but relatively small percentages of middle aged residents. (Forty-eight percent residents were in the 15 to 35 age group and 25% were over 65.) Incomes of East Lawrence residents are far below the average for the City of Lawrence. The older houses are presently serving the function of providing housing for very low to moderate income groups who have lived there for many years and who intend to remain there. The future population will probably remain at present levels, with some slight increases. Housing at reasonable prices is in short supply.

Significant expansion of the downtown commercial facilities to the east would probably precipitate some high density residential construction within convenient walking and driving distance and result in a net increase in population for the neighborhood. Street conditions are generally adequate to service the moderate amounts of traffic. In contrast, sidewalk conditions are generally poor. Spot clearance for redevelopment and adjacent vacant land for new developments are important.

Need. A neighborhood gives people a sense of security because of commonality either in race, socio-economic level, or simply frequent contact with the familiar faces of a housing complex. An interacting neighborhood promotes a sense of pride which helps upgrade an area and make it a more amenable place.

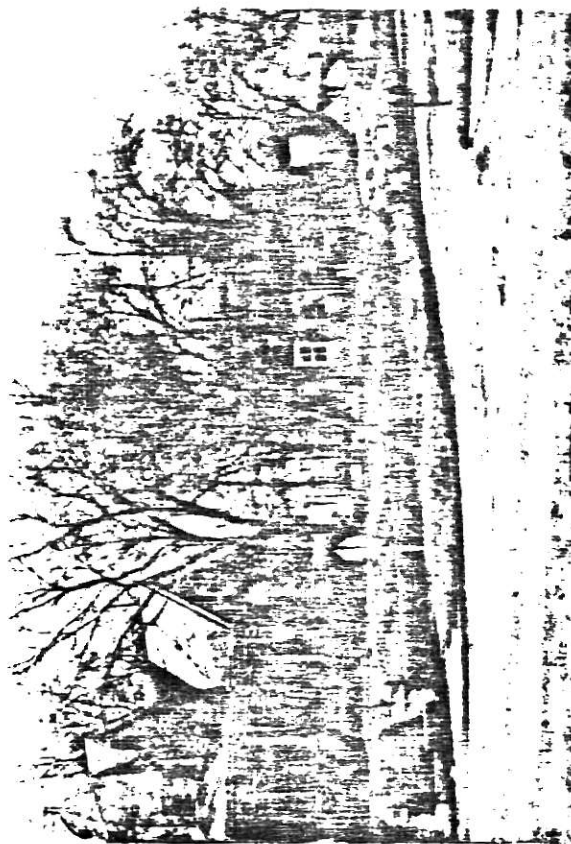
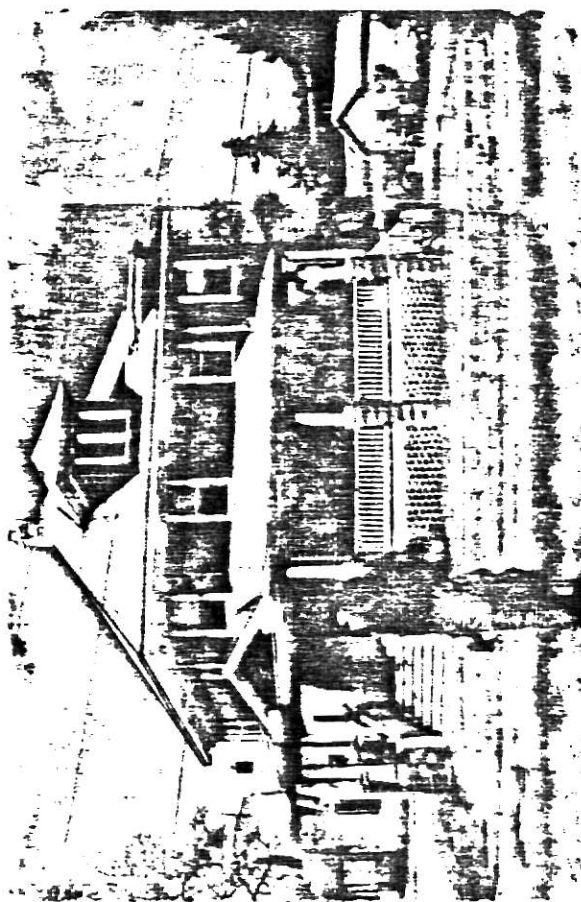
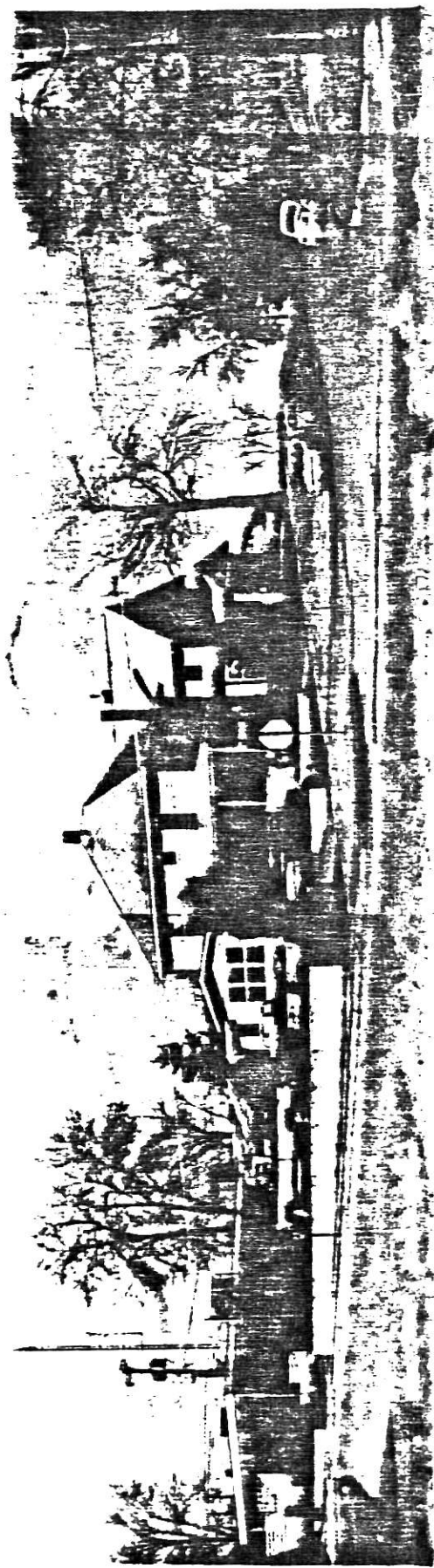


Figure 39: Existing Residences in East Lawrence

Placement of a housing project not only adds more life but upgrade the environment as well. According to Plan '95, approximately 2,550 new housing units in Lawrence (this does not necessarily include some replacement units) will be needed. It suggests a major adjustment in density patterns, with a higher proportion of new development going for multiple and higher density units.

A steady market for multi-family housing is expected to continue from the following sources: (1) The ever increasing percentage of retired and elderly persons in the city population. (2) Younger and middle-aged individuals and couples without children working on a full-time basis and preferring apartment living. (3) Increased preference for relatively low-maintenance apartment living. (4) Increased single family housing costs.

The development of housing in north part of East Lawrence, especially moderate to upper moderate income housing,* would tend to increase support for office, cultural, and entertainment facilities as well as strengthening retailing in C.B.D. Because of expected high rental rate, the majority of the housing will be studio, one-bedroom and two-bedroom apartments and is to be rented. The rest of the housing will have two-bedrooms and can be purchased.

A mixture of high density housing units shall be provided to appeal to the different needs and wants of the users. Important considerations are to maintain the necessary privacy and greenspace to keep the housing areas attractive to the buyer and renter markets. The most suitable housing type would be condominium** units with two to four-story walkups, since more units are able

* It will infill the existing gap between high-income and low-income housing projects.

** Condominium - A form of real estate ownership of a multi-family residential dwelling. Each occupant has 100% ownership of his own apartment and partial ownership to common elements such as hallways, elevators, plumbing...etc.

to share in a given amount of space.

Design Concept:

1. Mixed two and four-story apartments make a visual relationship to river and surrounding neighborhoods intimate scale. This mixed height approach would broaden the market reach of the development and provide more choice among the density, price and rent alternatives.
2. The spacial arrangement of residential units is paramount to achieving as much visual and physical access to the riverscape as possible.
3. Preservation of open space will permit continual visual access from points within the site and further inlands, or up and down the shoreline.
4. Natural variations in elevation may also be used to create interesting views of the riverfront or a specific riverfront activity.
5. Utilize design elements such as scale, rhythm, proportion, texture, circulation...etc. to achieve a pleasant environment which exudes a sense of place.
6. Neighborhood streets should be rerouted or modified to discourage through traffic.
7. Maintain the scale of existing neighborhood. The Urban Land Institute⁴¹ recommends that the number in one row be limited to five to eight units, thereby eliminating possible monotony.

Study Area Number Four: Riverside Flood Plain and the Kansas River

Natural Resources:

1. Soil - Ro (Riverwash): This soil type consists of an unstable mixture of sandy and loamy sediment on the lowest level along Kansas

River. This mixture is constantly changed, deposited, or removed, depending on the water level and the location of the river channel. Each time the river floods, the Riverwash deposits change in depth, size, and other characteristics. ³²

2. Vegetation: Wetland plants are annual and perennial wild herbaaceous plants such as smartweed, wild millet, rushes, sedges, reeds, arrowhead, saltgrass, cordgrass and cattail. Native woody growth is cottonwood and willow. ³²
3. Wildlife: Much herbaceous and woody growth has produced food or cover for wildlife that use wetland habitats. Beaver signs can be seen on trees near the river and woodchuck and coyote dens are found in earth mounds. Sometimes deer will appear too. ⁴²
4. Water Quality: Due to numerous bridge crossings, water pollution and visual pollution from the bordering industrial development, the Kansas River has experienced very little recreation use. However, the recent emphasis placed on requiring permits to control industrial effluents can be expected to reduce the level of pollution significantly. State water quality standards for the Kansas River have established public and industrial water supply, recreation including sport fishing, agricultural purposes, and receipt of treated wastes as accepted uses. Consequently, the recreation, open space potential can be expected to improve. Existing fish life is primarily a low grade population of carp. As pollution is controlled, pollution tolerant organisms would be replaced by intermediate or pollution sensitive organisms capable of inhabiting the Kansas River. These organisms would serve as preferred fishfood organisms. It is possible in time, the Kansas River could support a combination of warmwater fish such as channel catfish, flathead catfish, sauger, white bass, and various pan fish. ⁴²

Recreational Resources. The recreational resources will consist of a river-based low density development conducive to activities requiring considerable acreage. These include bicycling, hiking and nature trails, picnicking, camping, riparian fishing, boating, and canoeing.⁴³ The development of convenient public access to the activity areas should be a major consideration.

Man-made Resources. The flood plain along Kansas River is potentially a great asset to Lawrence. Activities, such as fishing, picnicking, games and observation of the dam, will attract people to the Kaw riverbank. Planting, paving, lighting, land forms, and beautiful views will make these areas into successful parks. There are three riverfront parks being considered.

1. Main Riverfront Park (Community Park): Presently in the planning stages, the City has been working with the U.S. Army Corps of Engineers to develop the 994 acres within the flood control levee and the river from the present landfill site south to the bridge and east to Mud Creek. Expected completion by the end of 1980 are boat ramps, bicycle trails, hiking trails, both overnight and primitive camp sites, picnic areas, overlook areas, vault toilets, parking, roadways, etc. All facilities to be constructed with the exception of the bike and hiking trails, will be concentrated in the four access points.⁴³ (See Figure 40) It is assumed that each visitor will engage in 1.5 of the studied activities, resulting in a peak day estimate of 700 persons. (See Table 5) To complete an estimate of total annual visitation, the 18 weekend peak days in May and September (12,600 visitors) will constitute 75 percent of the visitation in the two peak months, giving a total visitation for May and September of 16,800. Conservatively speaking, these high visitation periods could constitute one-third of the total annual visitation, resulting in a annual visitor estimate of 50,400 active recrea-

tionists.⁴³

TABLE 5

Lawrence Riverfront Park Estimated Park Capacity - Peak Activity Days

Activity	Quan.	Activity standard	Load factor	Turnover	Total Activity Participation
Bike trails	9.4 mi	4 groups/mi	3	2.5	280
Hiking	10.8 mi	4 groups/mi	3	2.0	260
Bank Fishing	10.25 mi	4 fisherman/mi	1	2.0	80
Picnicking	40 units		3	1.5	180
Boating*	1 ramp	40 launches/day	3		120
Canoeing	10 mi	2 canoe/mi	2	3.0	120
					<u>1,040</u>

*includes boat fisherman

Source: 43

2. Burcham Park (Community Park): Development began in 1977 with a financial gift from Mr. and Mrs. Riley Burcham. Plans for the 23 acre park include picnic shelters and areas, fencing of active water wells, road improvements, play equipment, overlook towers for viewing the river and preserving the nature cottonwood forest.³⁵
3. Tommy Constant Park (Neighborhood Park): Acquisition of land along Sixth Street between the new bridge and Tennessee Street has been made possible by a bequest from the Constant estate. Plans call for further acquisition, land clearing for a river view and hopefully a hiking path connecting Tommy Constant and Burcham Park.³⁵

Need

1. The Capacity: Using the standard of community park acreage per thousand population, developed by the National Recreation and Park Association, a demand of 457 acres of city parks (10 acres per thousand population) would be adequate for Lawrence in 1976. The completion of Clinton Lake in the summer of 1977 alleviated the

deficiency between the supply (169.1 acres) and the demand (457 acres). The lake is located 4 miles southwest of the Lawrence city limits. Douglas County and Lawrence will enjoy easy access to Clinton Lake, but this does not diminish the value of the resource of the city-owned land in the Kansas River flood plain which is unique to the area. The Comprehensive Outdoor Recreation Plan for Northeast Kansas (1968) lists the following activities for which demand exceeds supply in Douglas County, (See Table 6) and which are planned as important attractions of the Kansas River development.⁴³

TABLE 6

Douglas County Recreation Demand Projections, Lawrence (from 1968 SCORP)

Project demand year.	Projected range of Supply (+)/Deficiency (-)					
	* Picnic acres	Boating acres	Fish acres	Hiking trails miles	Bike trails miles	Community parks acres
1969	+129.6 to 124.1	-8,762	-368	-14.1	-75.5	-34
1980	+122.2 to 115.6	-10,700	-493	-17.3	-91.7	-78
2000	+116.9 to 109.4	-12,100	-582	-19.7	-103.3	-113
2020	+110.8 to 102.4	-13,700	-685	-22.3	-116.7	-152

* 1976 Comprehensive plan revision (now being prepared) shows 1980 surplus of +16 acres, but shows isolated need for further development in Lawrence.

Source: 43

2. Recreation Management of the Kansas River: Control of use is one of the major management problems today; it is one which is going to become even more critical as the demand for river recreation experiences increases and the supply of available quality resources decreases. There must be methodology to permit determination of the carrying capacity of a river consistent with the preservation of the resource as classified. Once established, the river management plan must control use at, or below, that capacity in order to assure preservation of the resource and a quality recreation ex-

perience for the user.⁴⁴

3. **Wise Flood Plain Management:** Flood plains are well adapted to low density recreation uses which require only minimal facility development, such as bird-watching, hiking, camping and fishing. Many types of regulations and public policies for flood protection share the principles of using flood plains for compatible open space purposes such as recreation, agricultural, and other low density uses, and discourage commercial, industrial, or residential development.⁴³ Flood plain action in general is stimulated at the local level. Local government should adopt and enforce subdivision and building regulations which restrict new development in flood plains. Removal of structures in flood prone areas continually subject to flood damage is a good policy, rather than devise structural measures that abate floods. To avoid hardship on owners, structures could be removed when the economic or useful life of the structure is over. The Nationwide Outdoor Recreation Plan specifies: "The Federal Government will encourage all levels of government and the private sector to use flood plains wherever feasible for park and recreational purposes."⁴⁵ In Lawrence, flood plains should be considered as a valued natural resource, not to be wasted or abused by mismanagement or nonmanagement. Structures in flood plains protected by levees must meet "flood-resistant" criteria. New residential structures must be elevated above flood levels; non-residential structures must be elevated or floodproofed. Eventually, the riverside grain elevators will be cleared for public open space and recreation use. The city of Lawrence will manage all aspects of the recreation development. The Lawrence Parks and Recreation Department will manage wildlife, forests, grassland, and other natural resources. Various State agencies will give assistance

to the city in many aspects. Other State, county, and city department will assist in fire and safety consideration.⁴³

Design Concept:

1. Because flood flows will occasionally damage the recreation development, the capital investment on the flood plain has been limited to facilities which are flood resistant or easily repairable.
2. The overall popularity of a riverfront recreation development is dependent on convenient access. It is required to provide extremely convenient public access to bike trails, foot trails, river-type boating and fishing activities and interpretation of the riparian ecology.
3. The naturalistic shoreline development consists of generally clearing of trees to enlarge views, lighting, signage and naturalistic planting. Where the banks of the river are extended, verticle posts, fill dirt and appropriate plantings are used to establish the banks.
4. The inspection access road on top of the North Lawrence Levee would serve as a surfaced bicycle path.
5. Rehabilitate the riverside industry for other uses or remove to improve access to river.
6. Hiking/biking path, and scenic riverside drive system with landscape treatments should be provided.
7. Use river steps to clean-up or reduce river pollution.
8. Water jet to draw attention to river and serve as focal point at entry to C.B.D.

SUGGESTED LAWRENCE URBAN RIVERFRONT REDEVELOPMENT

The improvement studies, mentioned above, have played a major part in determining the appropriate land use arrangement for Lawrence urban riverfront. These analyses, taken into this account with the requirements for functional organization and circulation, are reflected in the basic conceptual plan (See Figure 41). It is important to note that from outset a special effort has been made to discover the unique features and qualities of the riverfront region and, then, to adapt the improvement program to these conditions.

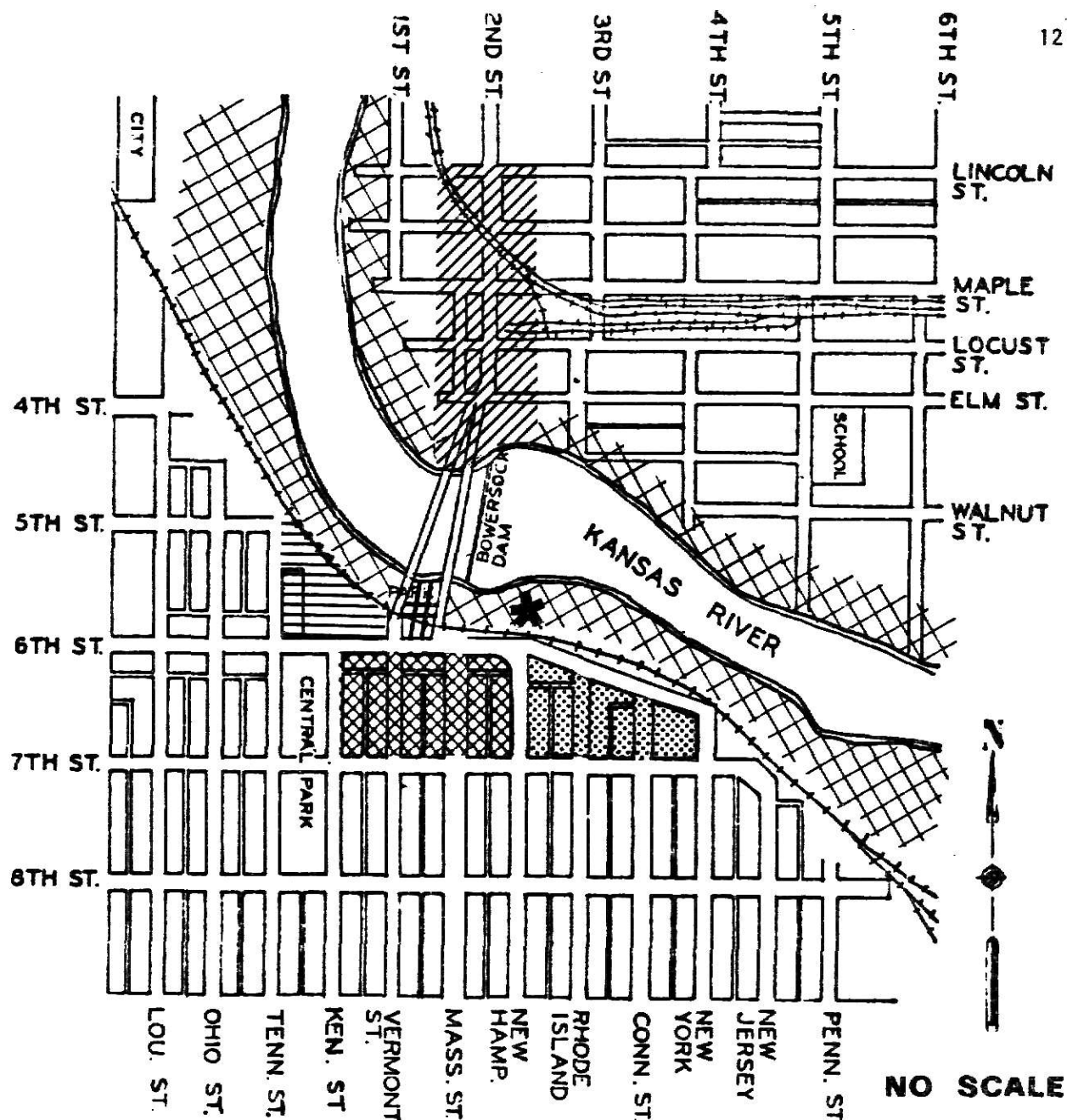
The suggested Lawrence urban riverfront redevelopments consist of two parts: the renewal of man-made environment and the improvement of a naturalistic shoreline. The man-made environment includes the study area number one, two and three. The naturalistic shoreline concerns the riverside recreational development in study area number four. The following considerations are important to the overall design:

1. Locate each development/redevelopment in an area that is capable of physically supporting it.
2. Interrelate proposed land uses and the transportation network to provide maximum convenience and a minimum of conflict.
3. To provide public access to the Kansas River and reserve a portion of the shoreline for public recreational use.

Proposed Land-use (See Figure 42)

Residential. The areas closest to the Central Business District (C.B.D.) (largely zoned RM-2) are designed for medium density residential. The areas to the south and east of New York School are largely designated for low density residential. Several blocks on Rhode Island Street and the area north of Seventh Street (zoned industrial) are designated for high density residential.

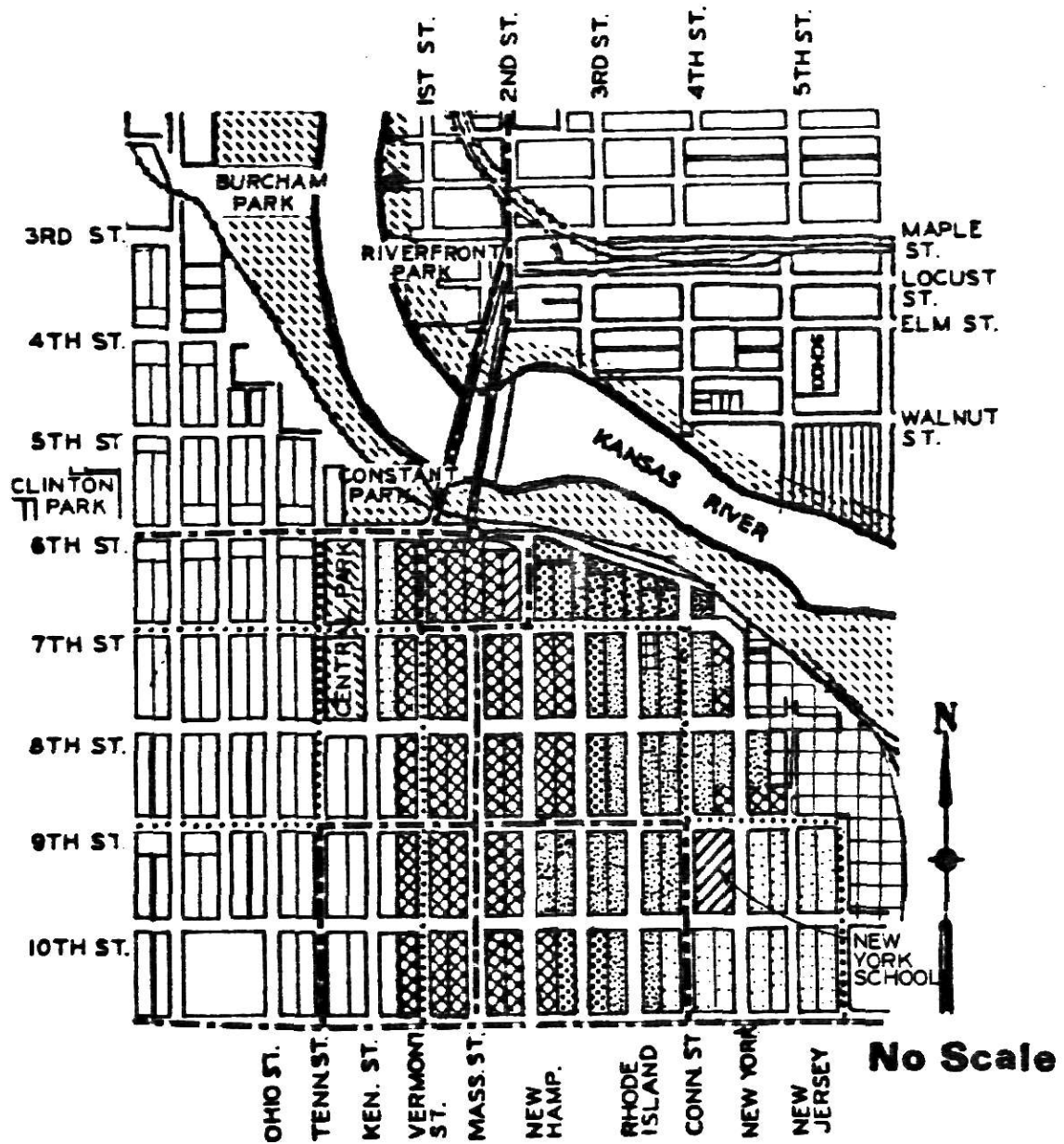
Commercial and Industrial. All areas designated for commercial and in-



LEGEND

- //// NORTH ENTRYWAY BEAUTIFICATION.
- ## ENTRY PARK
- * PAVED ACTIVITY PLAZA
- ||| CONSTANT PARK - AS A TIE BETWEEN CENTRAL PARK AND THE RIVERFRONT
- XXXX CONSERVATION AND INFILL DEVELOPMENT
- XXXX MIXED HOUSING DEVELOPMENT
- XXXX RECREATIONAL ALL SHORELINES AND MORE ACCESSABLE TO THE PUBLIC

Figure 41: Basic Conceptual Plan of Lawrence Riverfront Region



LEGEND

LOW DENSITY RESIDENTIAL

MEDIUM DENSITY RESIDENTIAL

HIGH DENSITY RESIDENTIAL

PUBLIC & QUASI-PUBLIC

SECONDARY ARTERIAL ST.

COMMERCIAL

INDUSTRIAL

PARKS & OPEN SPACE

LOCAL STREET

COLLECTOR

Figure 42: Proposed Land-use Plan of Lawrence Riverfront Region

dustrial are presently either used for that purpose, or vacant but zoned industrial or commercial.

Parks and Open Space. The areas designated for parks and open space are presently used or are being developed for that purpose.

Public and Quasi-public. Center Junior High, the New York School grounds, and various existing churches are designated for public and quasi-public uses.

Street Classifications. There will be a great change in C,B,D, traffic flow due to Constant Park, convention center, riverfront center, and housing development. The secondary arterial and collector systems are shown on Figure 42. 7th and 9th Streets are designated primarily to carry the existing industrial traffic out of the neighborhood.

North Entryway Beautification (See Figure 43)

The beautification plan is an effort to beautify the area lacking aesthetic and orientation along north 2nd Street in North Lawrence. The underpass, with railroad approval, could be developed as an attractive introductory city graphic framed by decorative planting on the embankments of both sides. The area, lacking orientation to the new bridge, could be made safer with some curb alignment and much more attractive and effective with planting on both sides to frame the final entry. The grain elevators at the end of bridge should be cleared eventually to provide visual access to the new city hall and riverfront development.

Most of the above suggested improvements are considered cosmetic; however, they also provide for additional safety in reducing visual distractions. At the same time, these improvements in north entryway will greatly stimulate the redevelopment of the riverfront region.

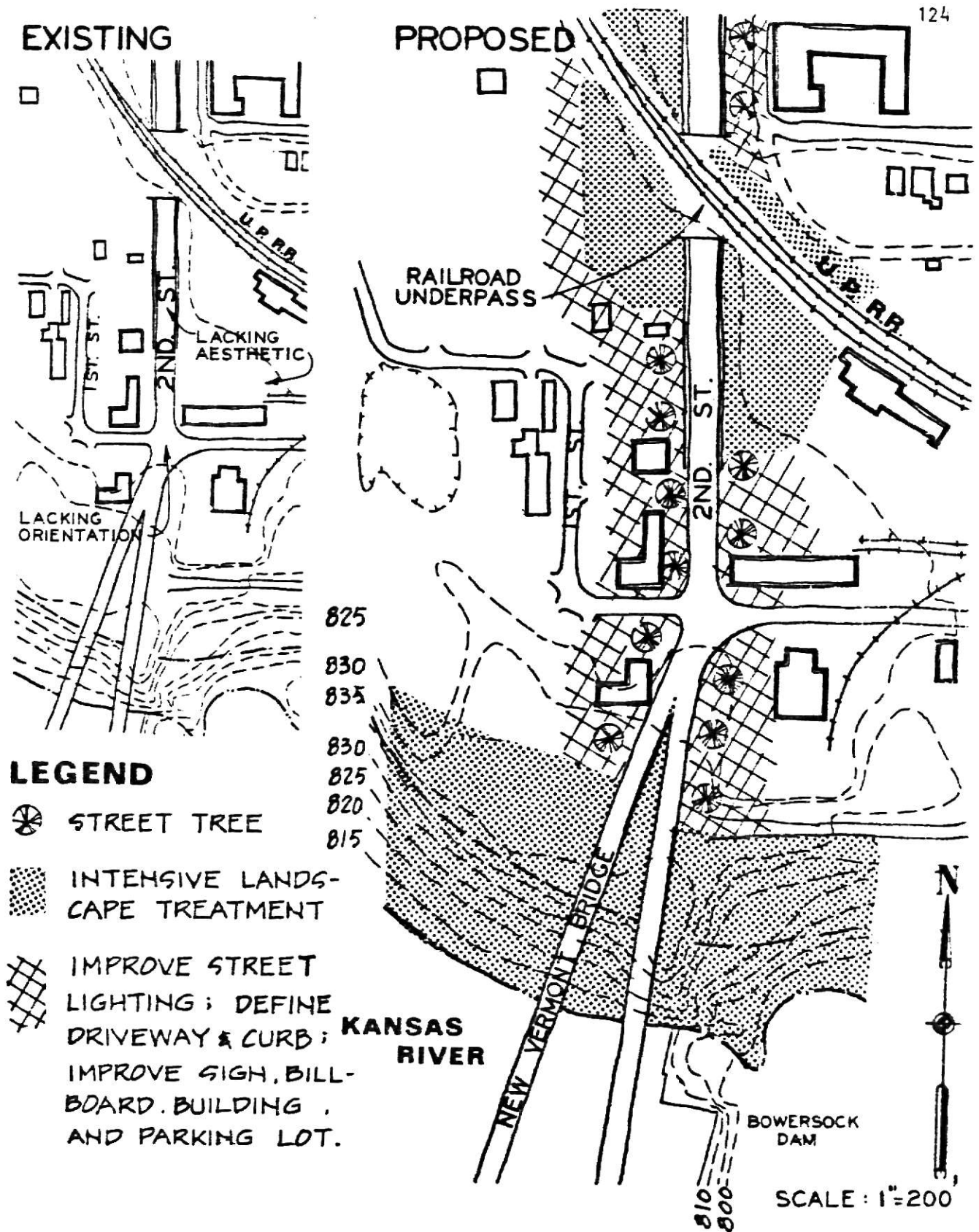


Figure 43: North Entryway Beautification Plan of Lawrence Riverfront Region

Riverfront Redevelopment

The tower, convention center, takes advantage of views and acts as a orienting landmark. Parking is contained within first, and possibly second, story. Ground level activities are oriented to the Kansas River.

The new riverfront center provides benches and entry canopy to allow customers to be comfortable for longer periods of time in more varying kinds of weather. It contains several small shops, or fewer larger shops for retail trade. It also provides recreational facilities for public such as clubs, small movie theatre. Plantings, paving patterns, and convenient distance make it a delight to visit during lunch hours.

Journal World Building is renovated to be the vocational training center, ending the need for the railroad spur that presently exist.

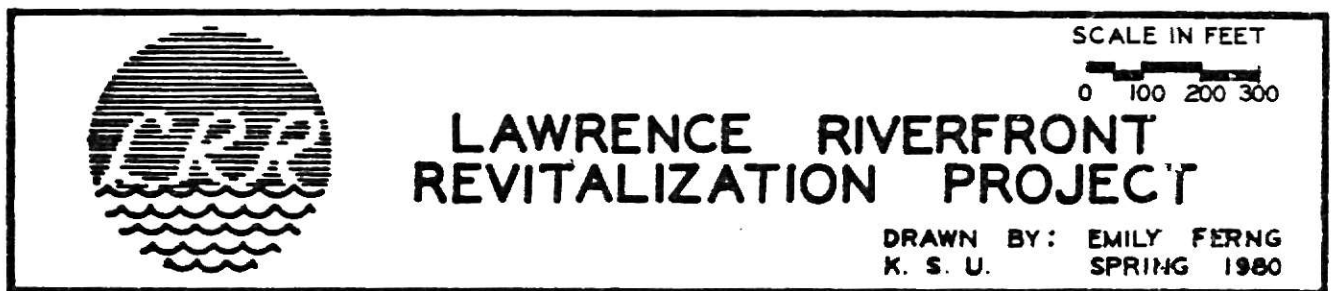
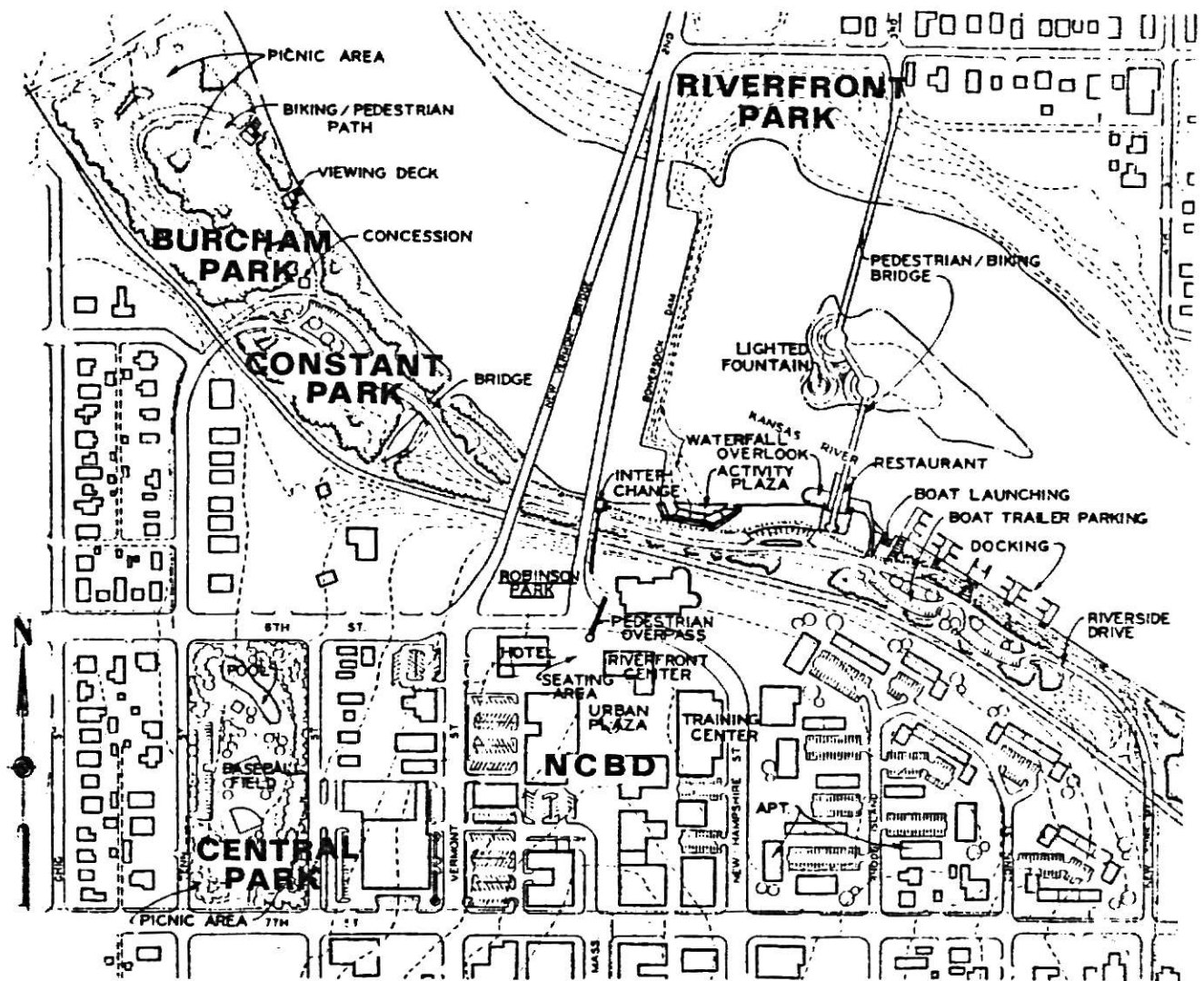
All these buildings will be major focal points and reinforce the quality of man-made environment in N.C.B.D.

The following drawings are simply suggestions to represent an idea for redevelopment and for the establishment of a unified theme. Perspective and Sections are drawn in order to see character of redevelopment and to understand the relationship between activities.

Cost Analysis

The suggested Lawrence riverfront redevelopment is in the conceptual stage that no detail are available. It is recommended by the Means Cost Data 1980⁴⁶ that square foot costs be used for preliminary figures. As soon as details become available in the project design, the square foot approach should be discontinued and the project priced as to its particular components.

Preliminary estimates of the construction costs have been prepared as a guide for the city officers in their evaluation and programming of the proposed improvements. (see Table 7) A contingency factor of thirty percent has been added to the estimated construction costs.



NOTES:

1. Maximum reuse of existing structures with new structures being built as infill.
2. Block the Massachusetts Street to be a pedestrian mall in N.C.B.D.

Figure 44: Riverfront Redevelopment Site Plan,
Lawrence

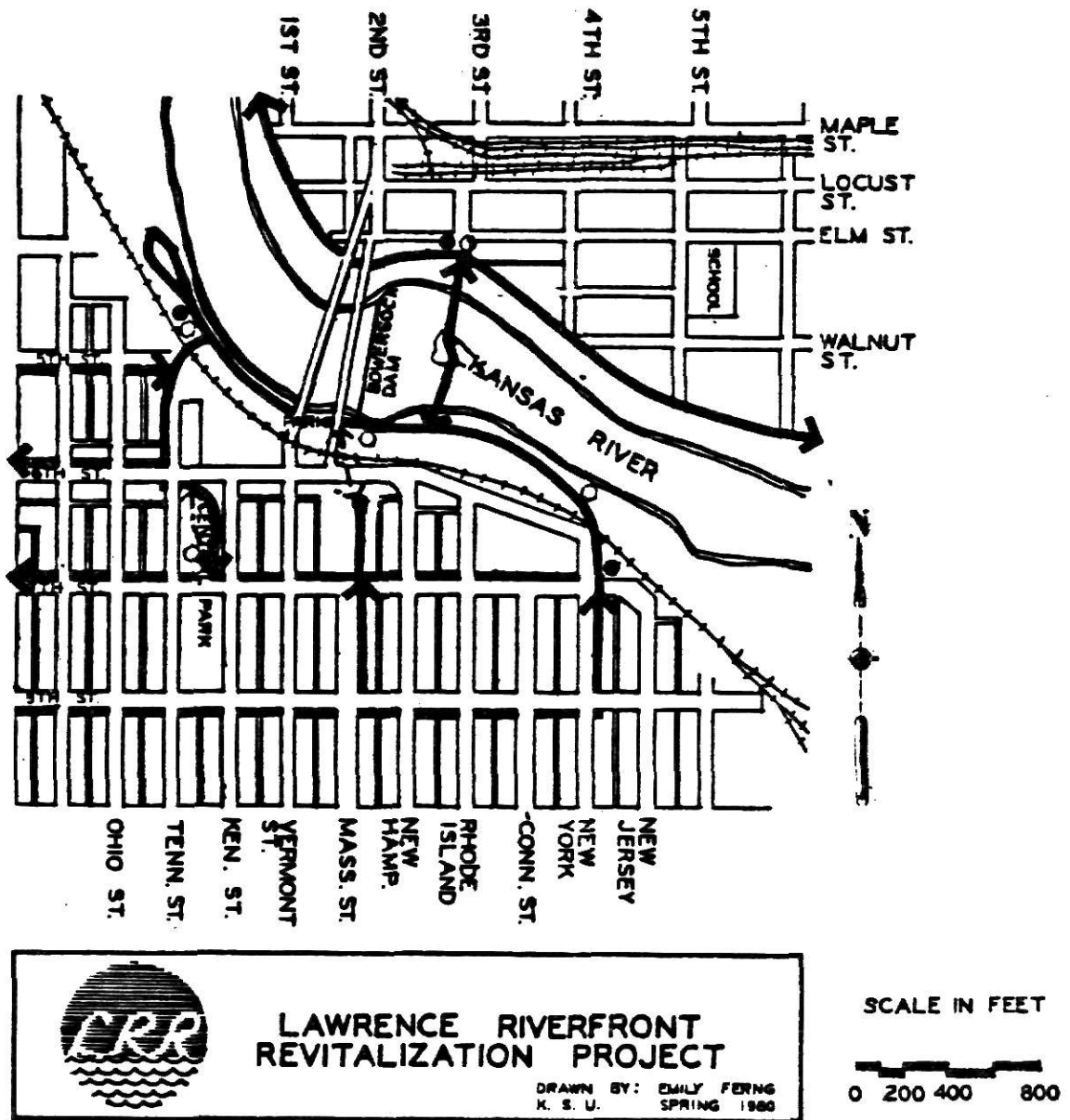
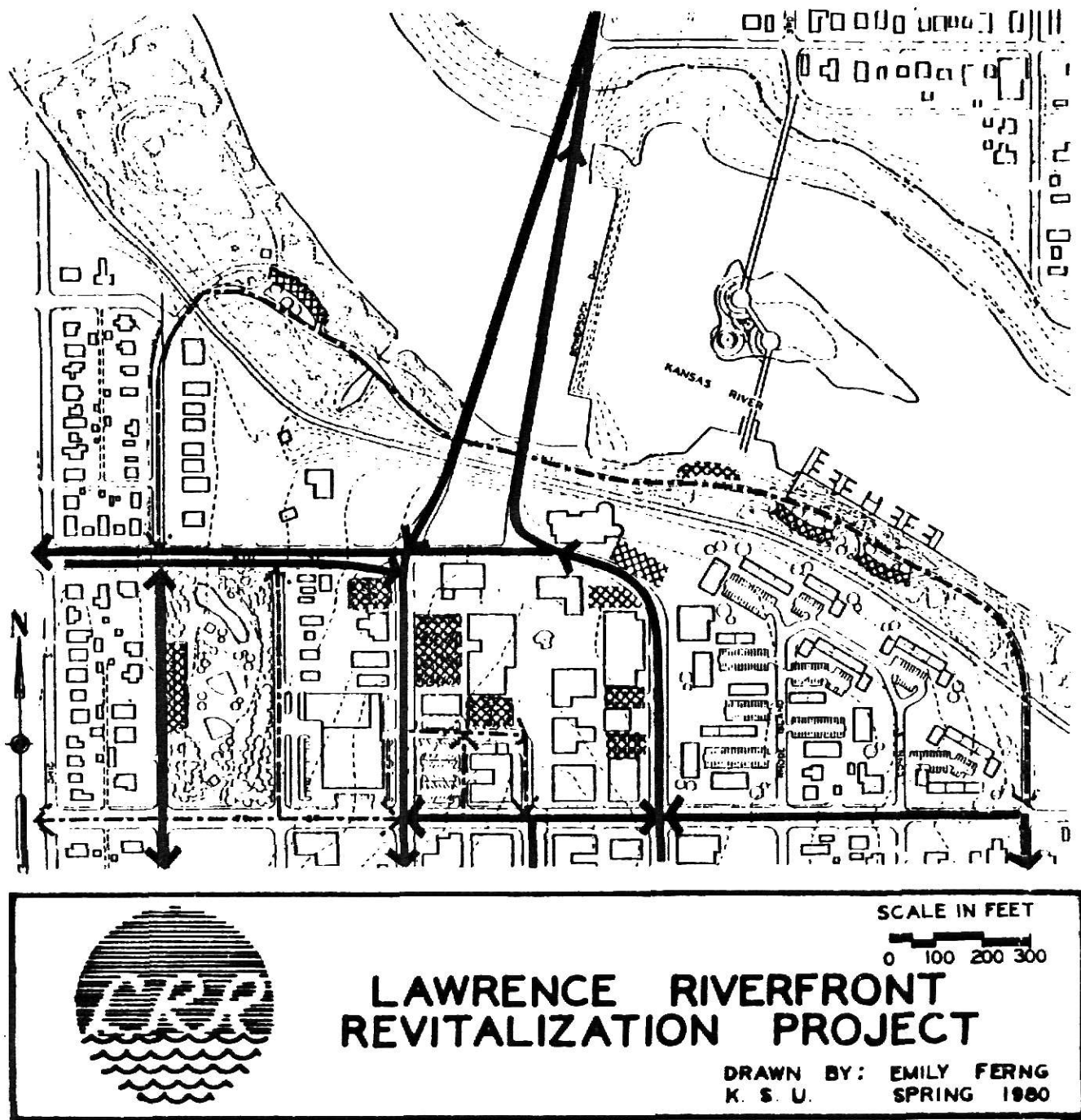


Figure 45: Biking and Pedestrian Circulation, Lawrence Riverfront Redevelopment



LEGEND




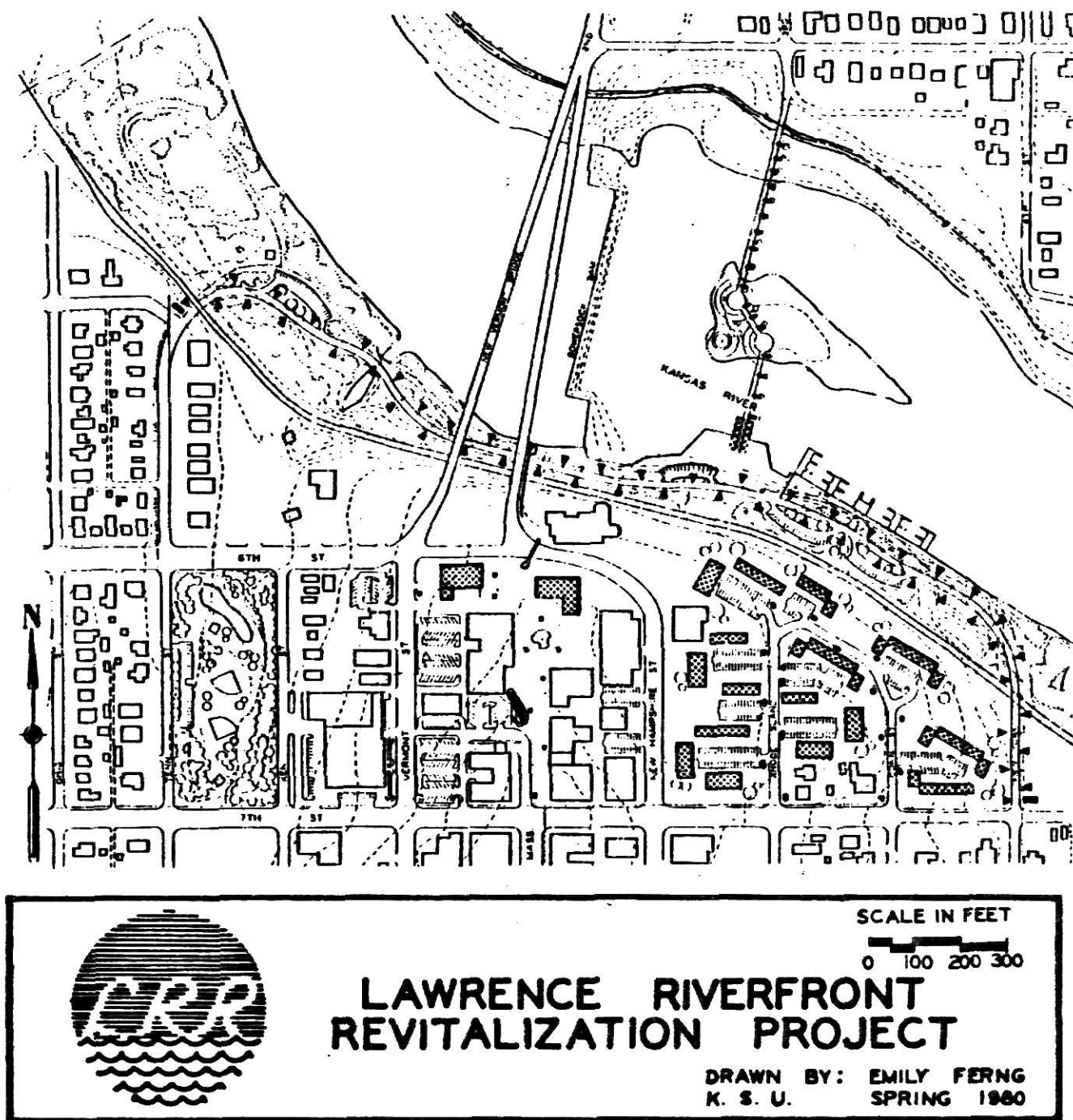

-  PRIMARY AUTOMOBILE ROUTES
-  SECONDARY AUTOMOBILE ROUTES
-  PRIMARY PARKING AREAS

Figure 46: Automobile Circulation, Lawrence Riverfront Revitalization



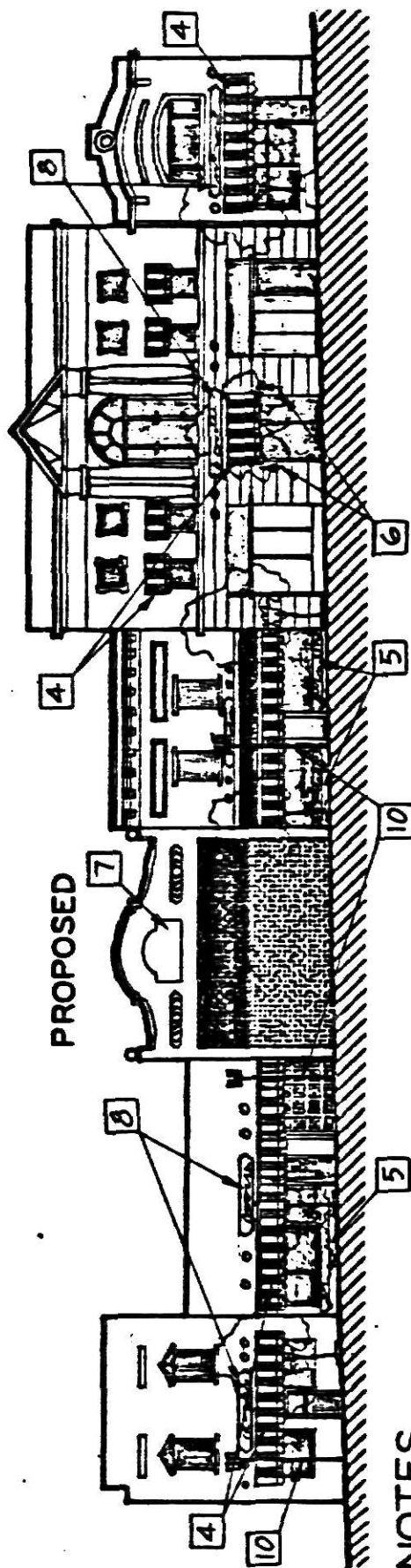
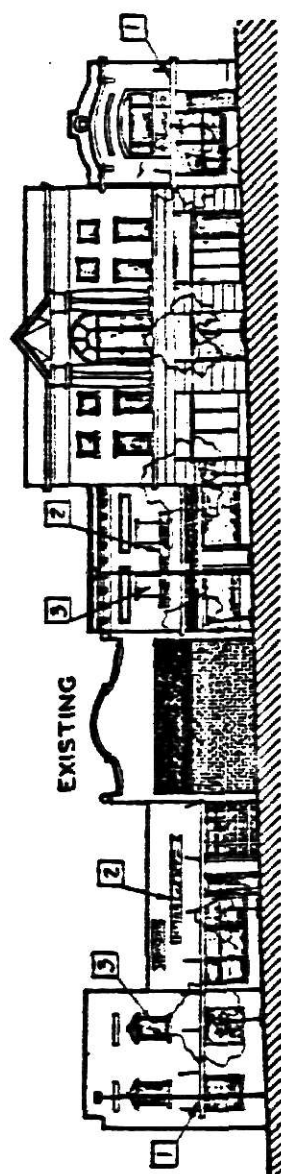
LEGEND

 NEW STRUCTURES

 ENTRANCE SIGN

 LIGHTING FIXTURES

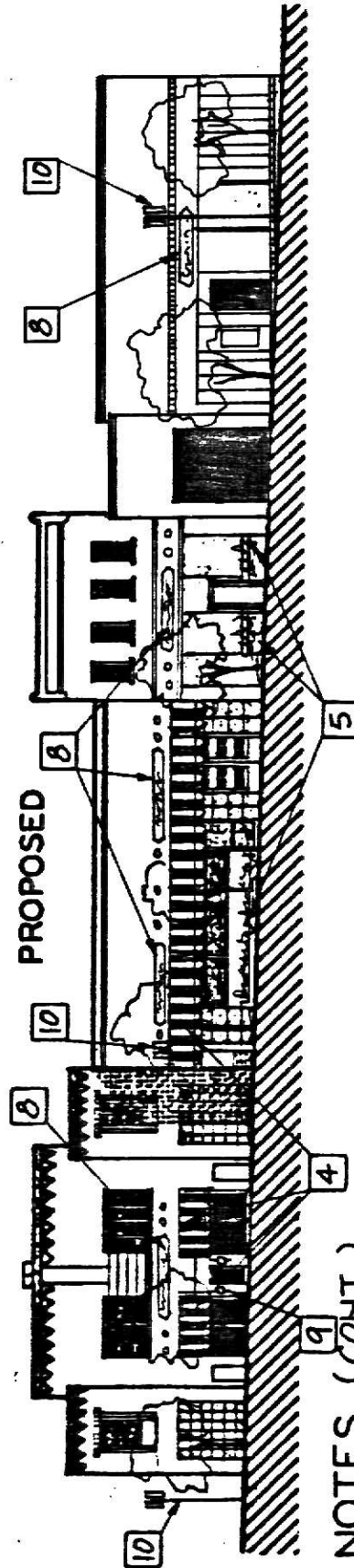
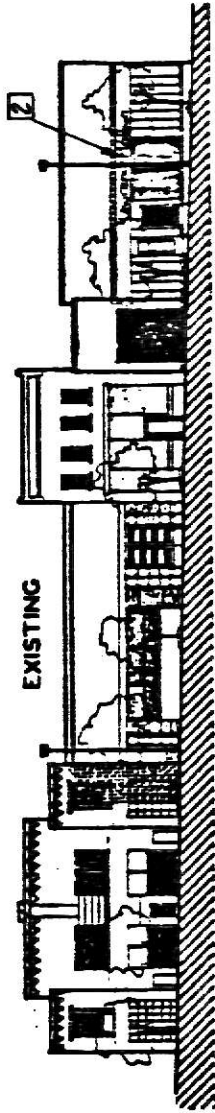
Figure 47: New Structures and Lighting System,
Lawrence Riverfront Redevelopment



NOTES

- 1 REMOVE FIXED CANOPY WHICH VISUALLY ISOLATE UPPER FACADE AND REPLACE WITH COLORFUL AND OPERABLE AWNING.
- 2 REMOVE "OUT-OF-SCALE" SIGNS THAT COVER UPPER FACADES.
- 3 REMOVE SOLID PANEL THAT COVER ORIGINAL WINDOW.
- 4 INSTALL NEW STRIPED COLORFUL AWNINGS FOR SUN OR RAIN PROTECTION.
- 5 PLANTING BOXES SOFTING HARD SURFACES AND PROVIDING DESIRED VARIETY.
- 6 ONE PAIR OF CLASSICAL LAMPS BE LOCATED ON BOTH SIDES OF ENTRANCE.
- 7 GRAPHIC DECORATION BE ADDED.

Figure 48: Conservation of East Side of Mass. St.,
N.C.B.D., Lawrence

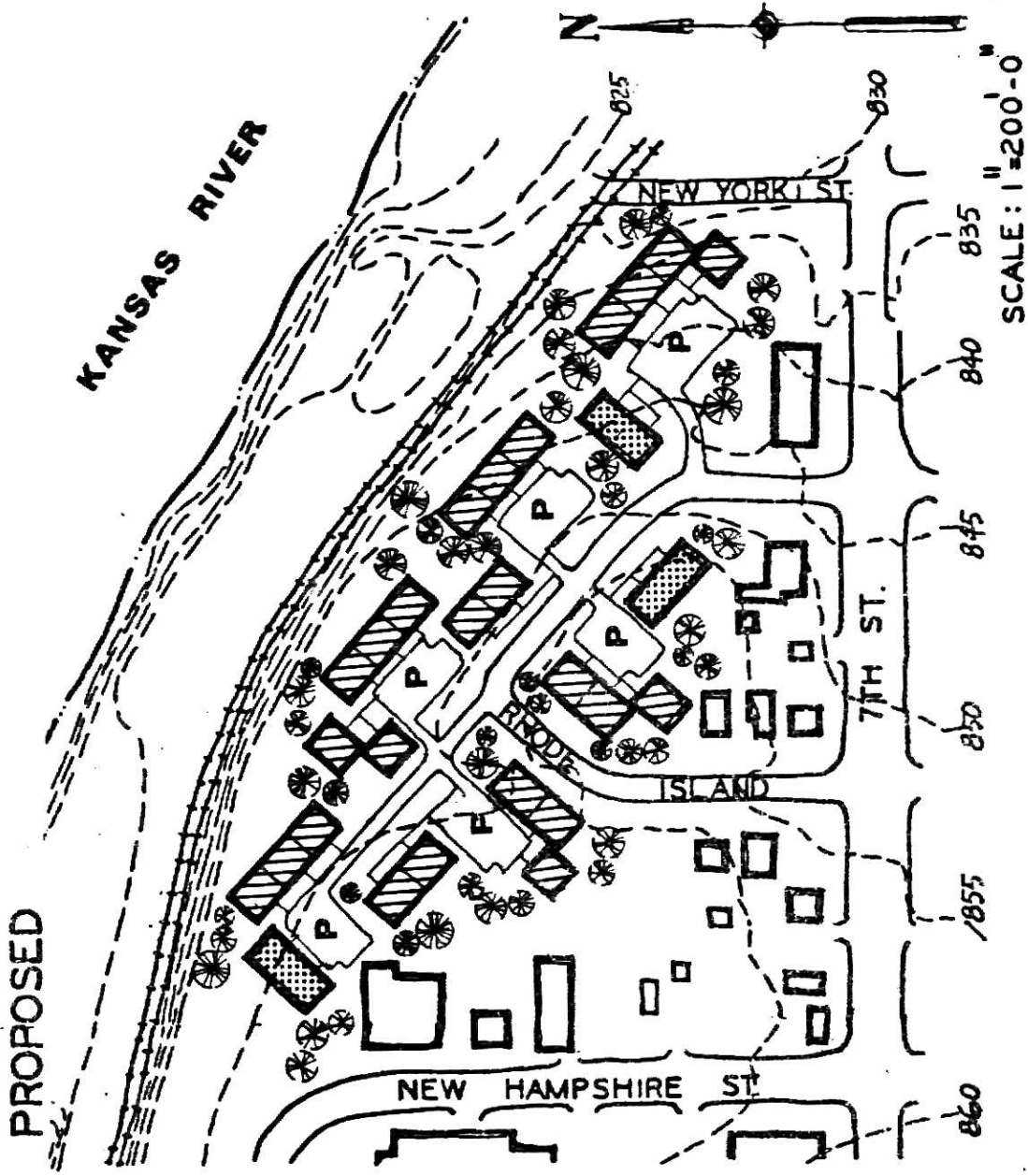
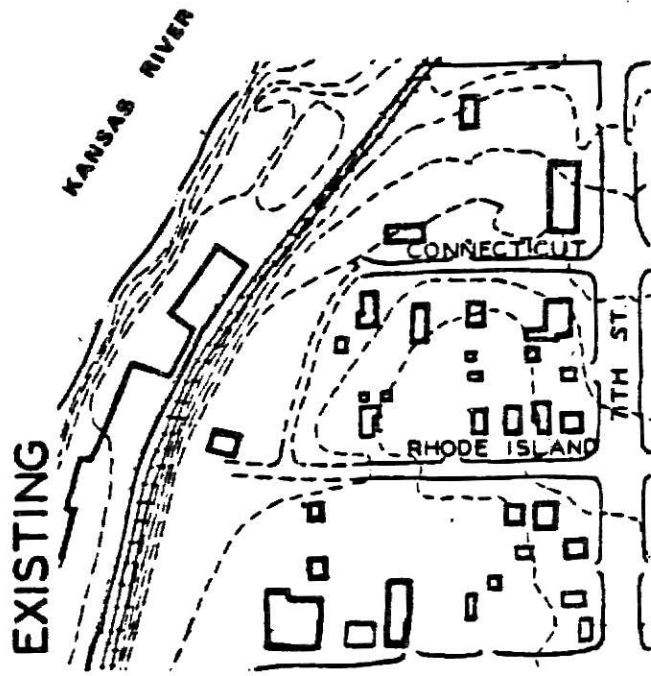


NOTES (CONT.)



- 8 SMALLER SIGNS & GRAPHICS BE DISPLAYED ON THE SPACE ABOVE AWNINGS.
- 9 A PAIR OF GLOBED LAMPS ON BOTH SIDES OF THE BUILDING ENTRANCE.
- 10 STREET LIGHTING FIXTURES KEEP CONSISTANT WITH OTHER BLOCKS.

GENERAL NOTE: All the efforts offer alternatives to the shopowners and public officials who wish to improve and preserve the downtown area as they remodel, conserve and maintain their properties during the coming years.

Figure 49: Conservation of west side of Mass. St.,
N.C.B.D., Lawrence



LEGEND

-  50' x 30' TWO-STORY APARTMENT BUILDING
-  100' x 40' FOUR-STORY APARTMENT BUILDING
- P** PARKING

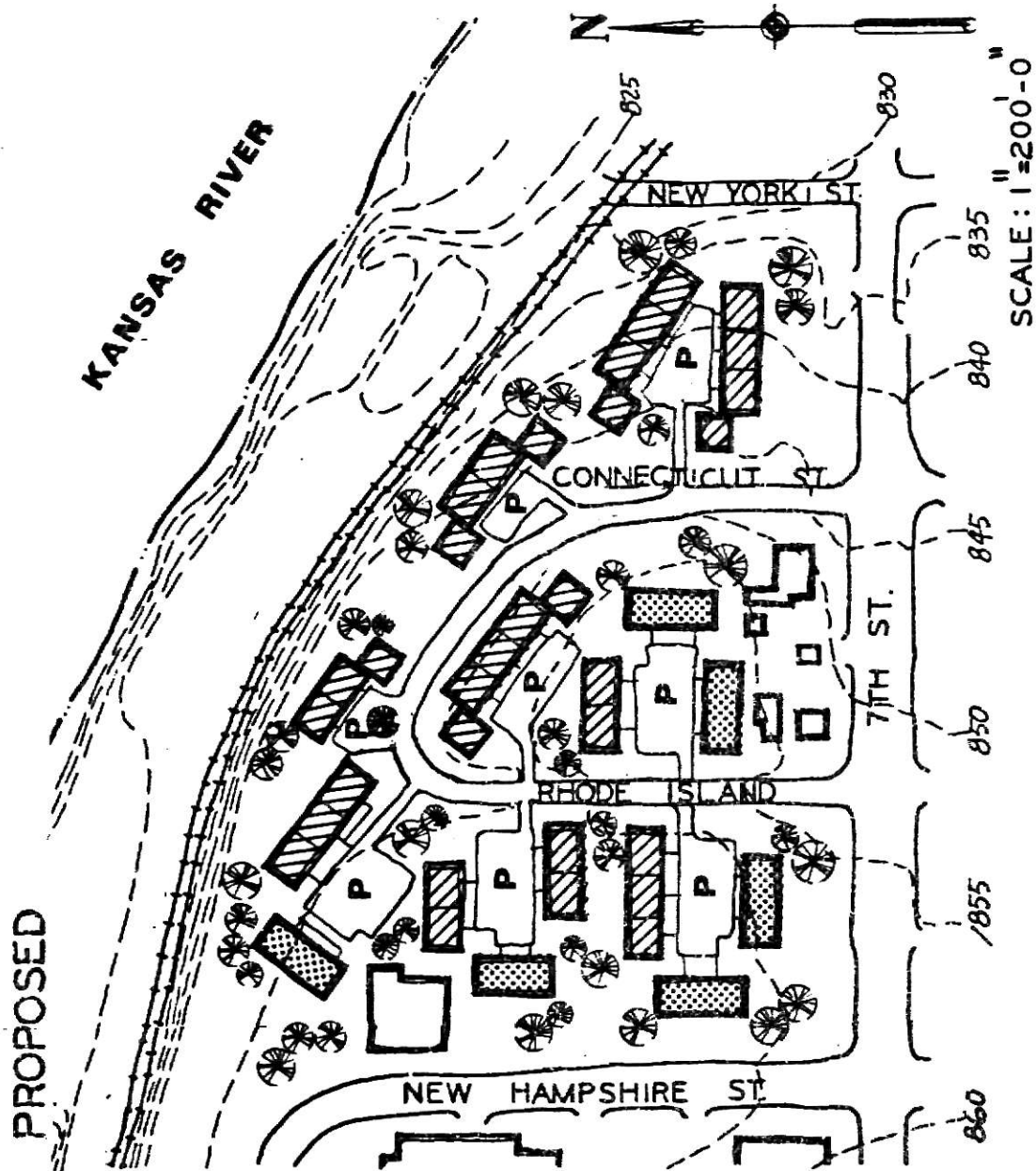
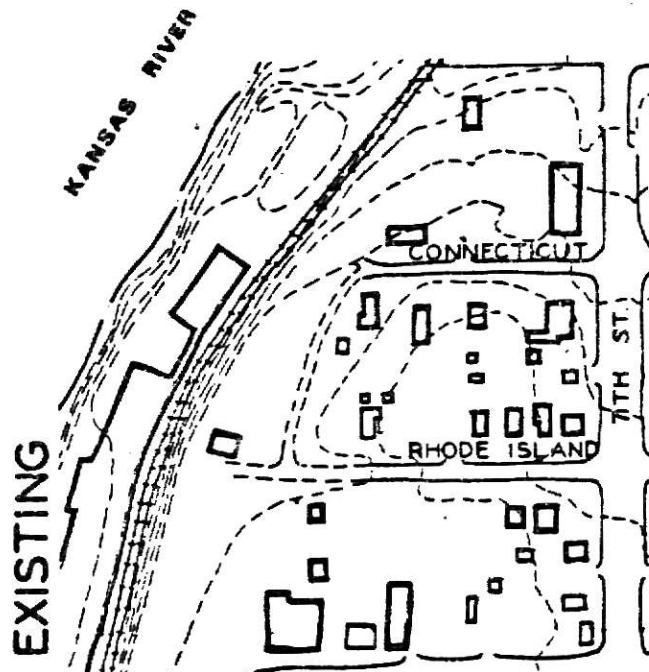
NOTES

DENSITY : $\frac{148 \text{ UNITS}}{8.5 \text{ ACRES}} = 17 \pm$




ROUGH COST : 3,636,000

Alternative One: This alternate is more realistic, in terms of the relatively small amount of change required and the relatively small scale of development.

Figure 50: Housing Development Plan, East Lawrence



LEGEND

-  50' x 30' TWO-STORY APARTMENT BUILDING
-  100' x 40' FOUR-STORY APARTMENT BUILDING
-  P PARKING

NOTES

DENSITY : $\frac{224 \text{ UNITS}}{10.5 \text{ ACRES}} = 21 \pm$
ROUGH COST : 6,000,000

Alternative Two: This alternate is more interesting. Cul-de-sacs are parking areas close to the housing units. The absence of through roads for vehicles frees the interior of the block of a common green space.

Figure 51: Housing Development Plan, East Lawrence

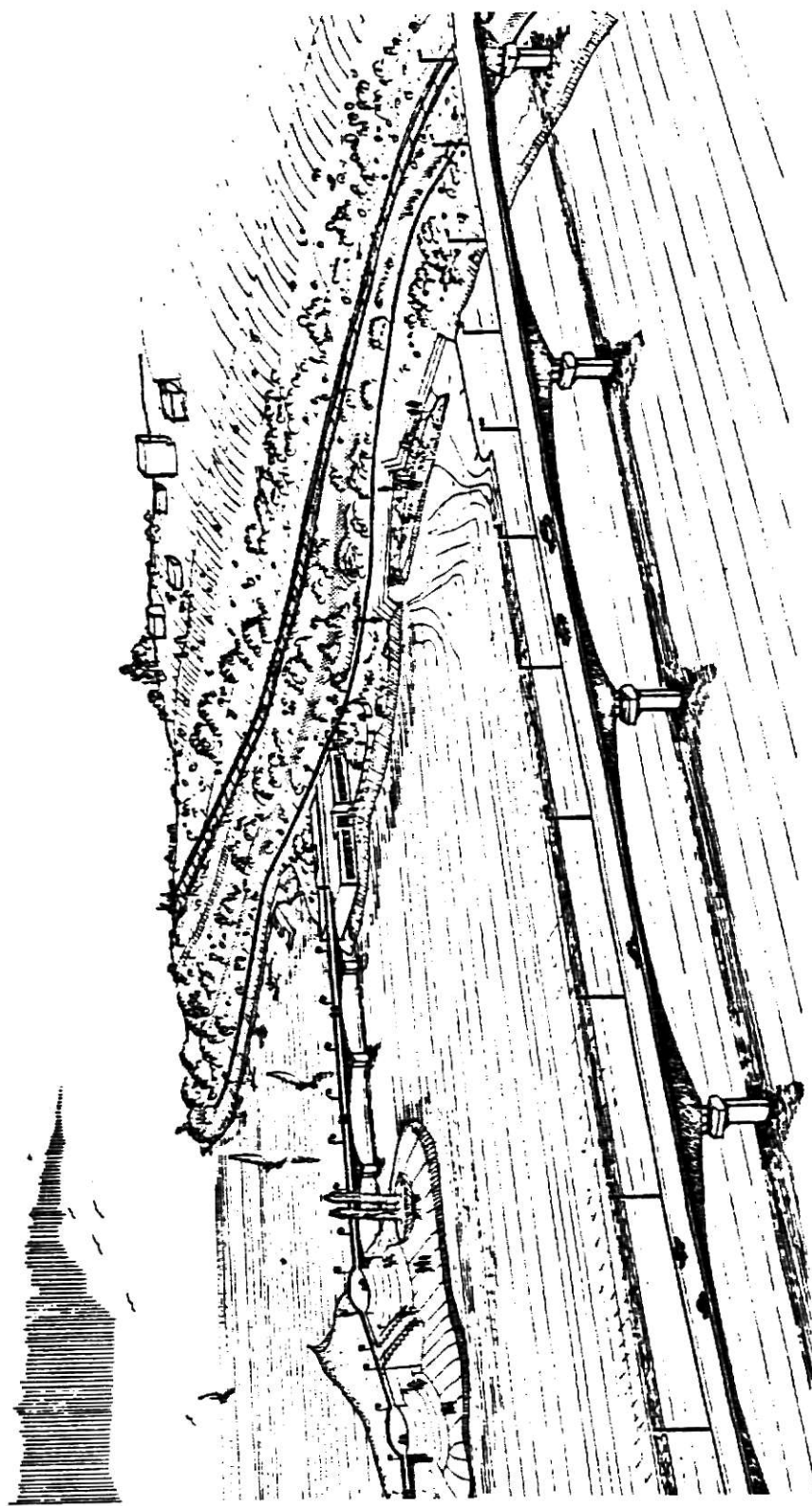


Figure 52: Birds-view of Shoreline Development,
Lawrence Riverfront Redevelopment

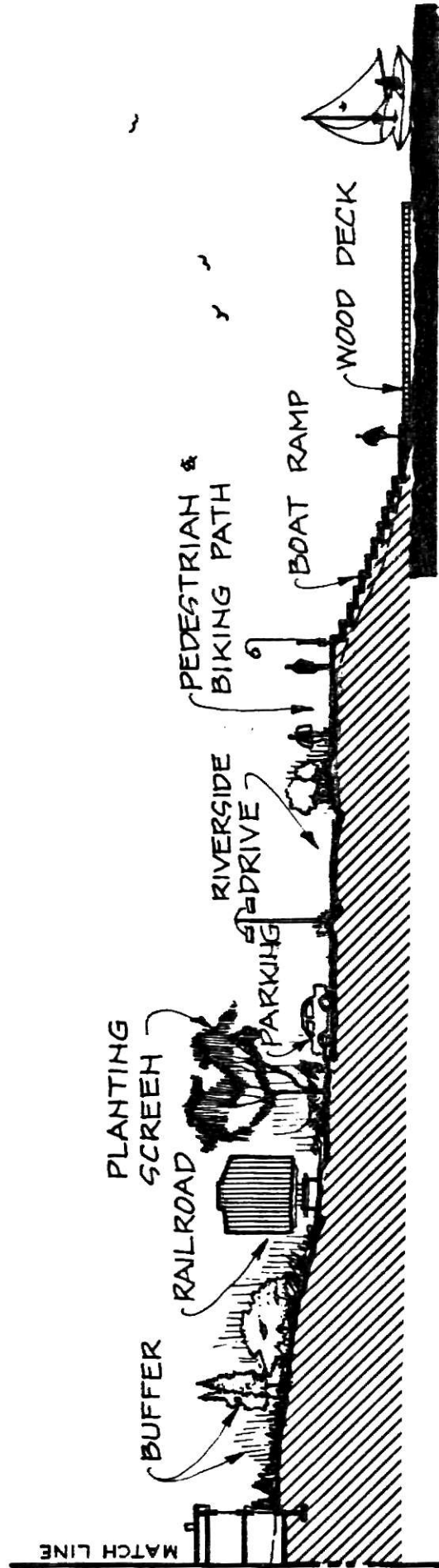
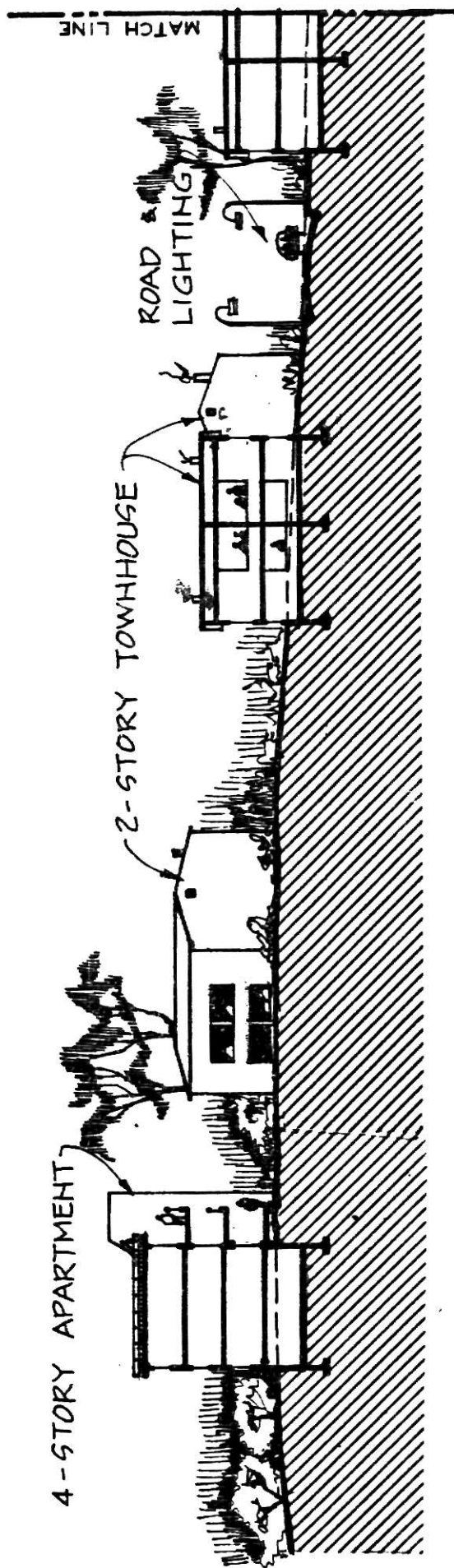


Figure 53: Section Thru Condominium Housing,
East Lawrence Redevelopment

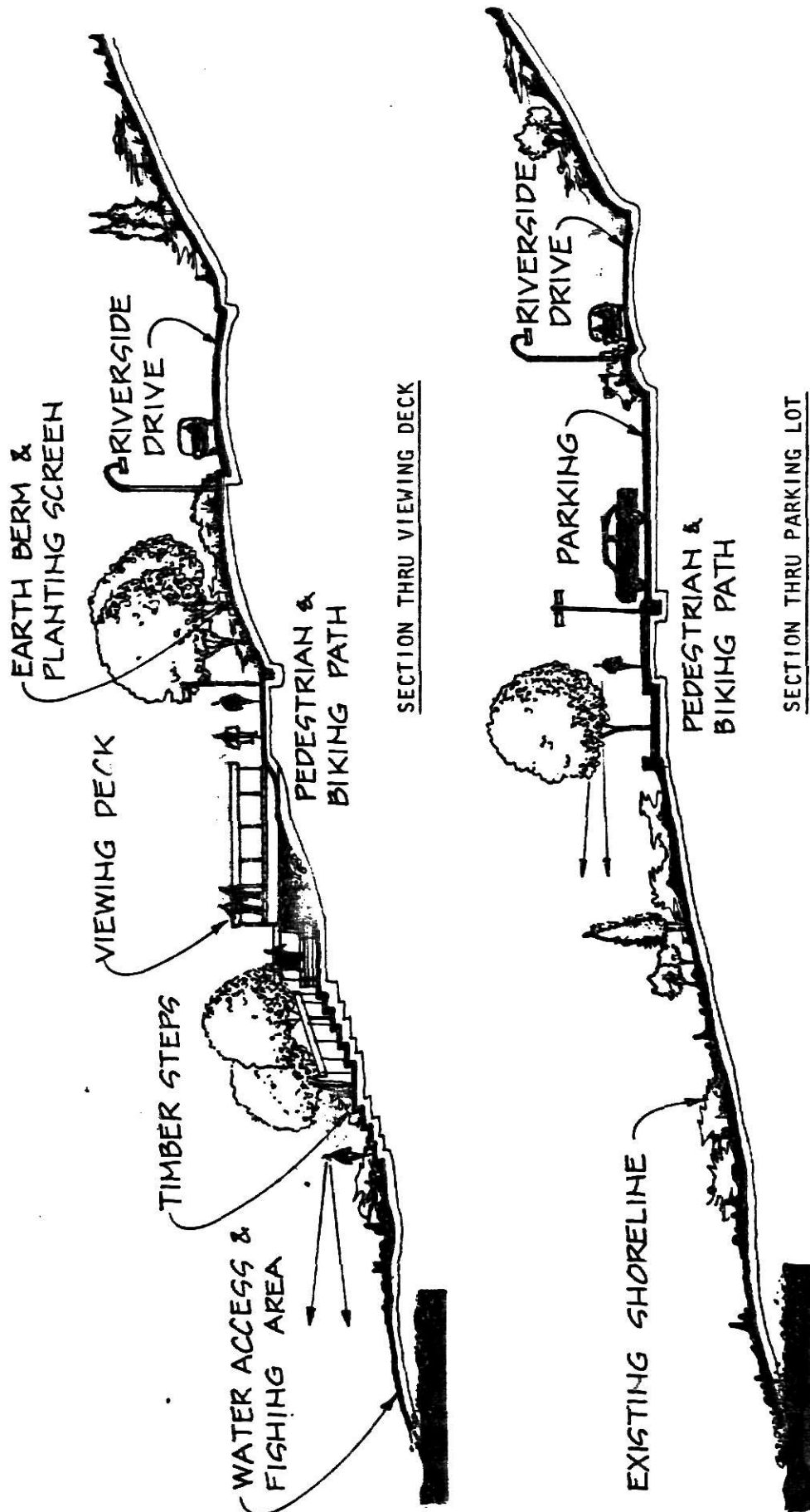


Figure 54: Typical Sections Thru Shoreline Development,
Lawrence Riverfront Redevelopment

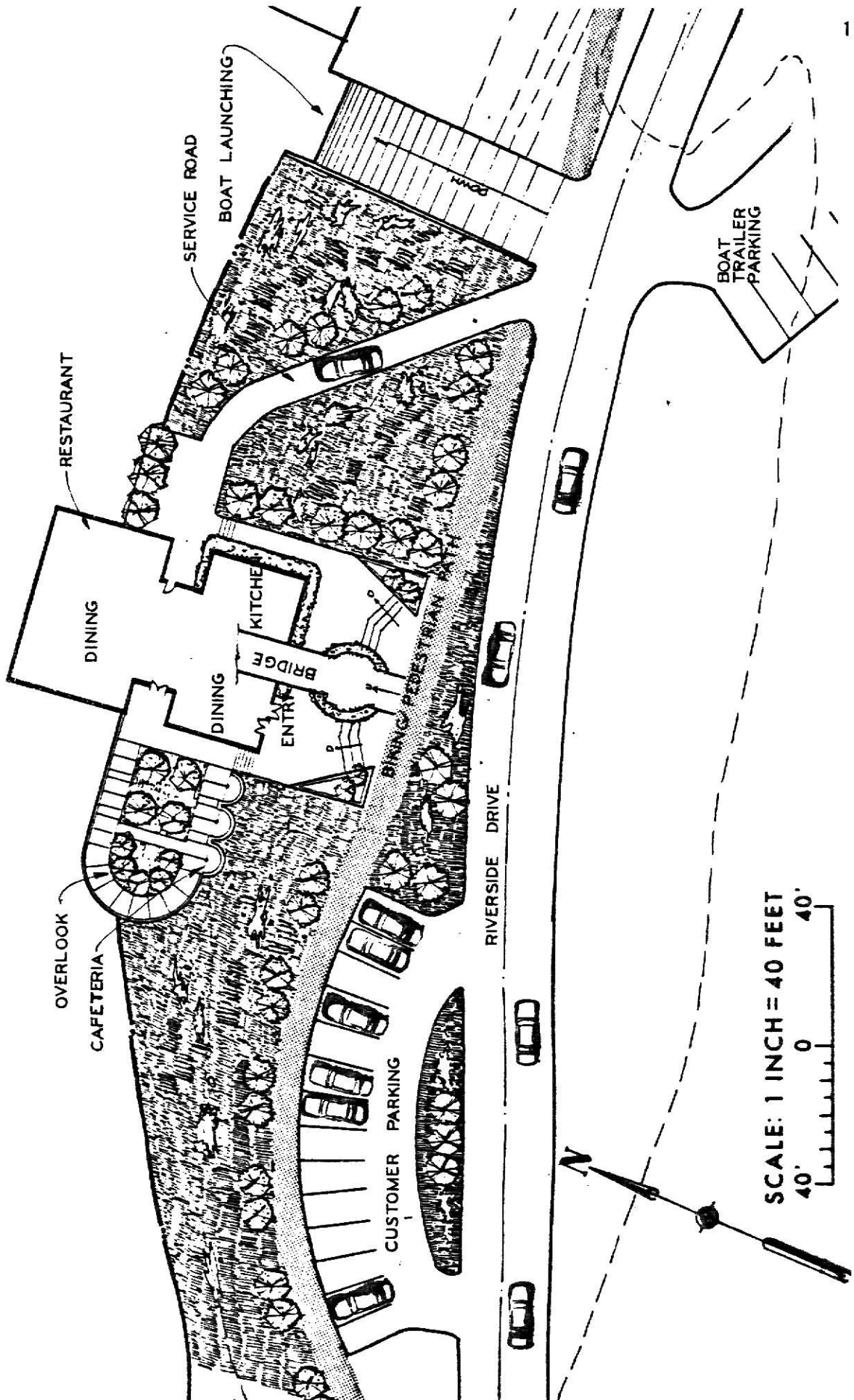


Figure 55: Riverside Restaurant under pedestrian/biking Bridge, Lawrence Riverfront Redevelopment

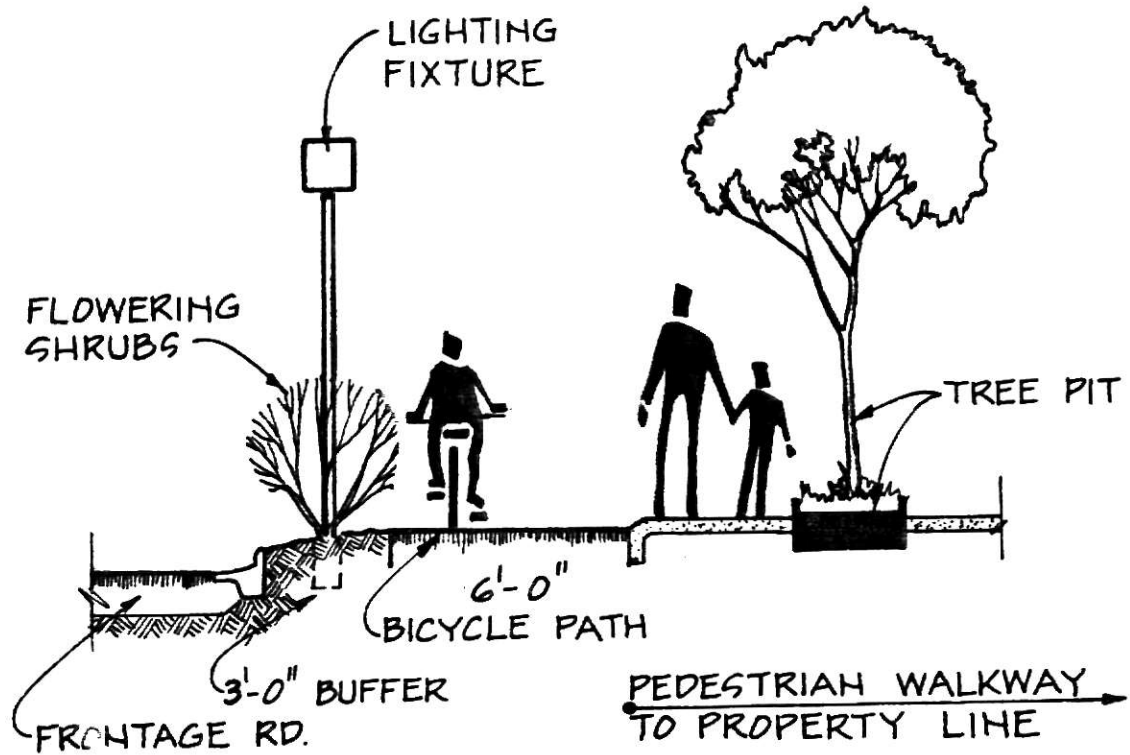
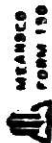


Figure 56: Typical Section of Pedestrian/
Biking Path, Lawrence Riverfront



Figure 57: Sign of the Health Hazard
Water, Lawrence Riverfront



COST ANALYSIS

PROJECT N.C.B.D. CONSERVATION & INFILL DEVELOPMENT SHEET NO. 2
LOCATION STUDY AREA NUMBER TWO ESTIMATE NO. 5
LANDSCAPE ARCHITECT EMILY (FERHG) LO OWNER DATE JUNE, 1980

QUANTITIES BY	DESCRIPTION	PRICES BY	EXTENSIONS BY						CHECKED BY Prof. PAGE		
			QUANTITY	UNIT	MATERIAL		LABOR		TOTAL COST	UNIT	TOTAL
					UNIT	TOTAL	UNIT	TOTAL			
RENOVATE	J.W. BUILDING TO TRAINING CENTER		22000	SQ. FT.			15		330000		
INFILL	3-STORY RIVERFRONT CENTER		30600	SQ. FT.			35		1071000		
INFILL	5-STORY CONVENTION CENTER		25000	SQ. FT.			50		1250000		
CONSERVE	OLD BUILDINGS (FACADES)		3500	SQ. FT.			10		35000		
PUBLIC	PARKING AREAS		6870	SQ. YD.			10		68700		
IMPROVE	INTERSECTION OF 6th & MASS. STREETS.								63000		
PEDESTRIAN	OVERPASS								30000		
PEDESTRIAN	INTERCHANGE (FROM MASS. BRIDGE DOWN TO SHORELINE)								8000		
URBAN	PLAZA { PAVING AND PLANTERS		5000	SQ. FT.			2.5		12500		
SEATING	AREA { BENCHES		5	EACH			120		600		
	{ RETAINING WALL								360		
	{ CONCRETE PLANTERS		3	EACH			200		600		
STREET	TREES		40	EACH			50		2000		
OPEN	SPACE LANDSCAPING		4.5	ACRE			10000		5400		
LIGHTING	FIXTURES		10	EACH			400		4000		
BIKE	RACKS		10	FT.			25		250		
MAINTAINANCE	& MINI-BIKE RENTAL		400	SQ. FT.			5		2000		

* Data from Capital Improvement Plan 1980-1985

TABLE 7: (Continued)



COST ANALYSIS

PROJECT N.C.B.D. CONSERVATION & INFILL DEVELOPMENT

SHEET NO. 2

LOCATION STUDY AREA NUMBER TWO

ESTIMATE NO. 5

LANDSCAPE ARCHITECT EMILY (FERHG) LO OWNER

DATE JUNE, 1980

QUANTITIES BY	DESCRIPTION	PRICES BY		EXTENSIONS BY				CHECKED BY Prof. PAGE			
		QUANTITY	UNIT	UNIT	MATERIAL	LABOR	TOTAL COST	UNIT	TOTAL	UNIT	TOTAL
	SUBTOTAL										2804910
	CONTINGENCY (30%)										865473
	TOTAL										3750383

PROJECT CONDOMINIUM HOUSING DEVELOPMENT

SHEET NO. 3

LOCATION STUDY AREA NUMBER THREE

ESTIMATE NO. 5

LANDSCAPE ARCHITECT EMILY (FERHG) LO OWNER

DATE JUNE, 1980

QUANTITIES BY	DESCRIPTION	PRICES BY		EXTENSIONS BY				CHECKED BY Prof. PAGE			
		QUANTITY	UNIT	UNIT	MATERIAL	LABOR	TOTAL COST	UNIT	TOTAL	UNIT	TOTAL
	4-STORY APARTMENT BUILDINGS	6	EACH		512000						3072000
	2-STORY APARTMENT BUILDINGS	34	EACH		84000						2856000
	SITE CLEARANCE										30000
	PLAY GROUNDS	3	EACH		4000						12000
	LIGHTING FIXTURES	15	EACH		750						11250
	OPEN SPACE LANDSCAPING	8	ACRE		10000						80000
	SUBTOTAL										6061250
	CONTINGENCY (30%)										1818375
	TOTAL										7879625

TABLE 7: (Continued)

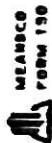


COST ANALYSIS

PROJECT IMPROVEMENT OF NATURALISTIC SHORELINE SHEET NO. 4
LOCATION STUDY AREA HUNTER FOUR ESTIMATE NO. 5
LANDSCAPE ARCHITECT EMILY (FERHG) LO OWNER DATE JUNE, 1980

QUANTITIES BY	DESCRIPTION	PRICES BY	EXTENSIONS BY					LABOR			TOTAL COST	
			QUANTITY	UNIT	MATERIAL		TOTAL	UNIT	TOTAL	UNIT	TOTAL	PAGE
					UNIT	TOTAL						
	RIVERSIDE DRIVE		0.6	MILE		80000					48000	
	LIGHTING FIXTURES @ 65'-0" O.C.		52	POLE		500					26000	
	PEDESTRIAN / BIKING PATH W/ LIGHTING		0.85	MILE		45000					38250	
	RIVERSIDE RESTAURANT		3500	SQ. FT.		5346					187000	
	LIGHTED FOUNTAIN		1	EACH		3000					3000	
	PEDESTRIAN / BIKING BRIDGE OVER											
	KANGAS RIVER		8000	SQ. FT.		50					400000	
	BRIDGE LIGHTING		17	EACH		200					3400	
	STREET TREES		30	EACH		40					1200	
	OPEN SPACE LANDSCAPING		12	ACRE		10000					120000	
	SCREEN PLANTING		1800	L.F.		5					9000	
	ENTRANCE SIGN		2	EACH		800					1600	
	BOAT RAMP		1	EACH		80000					80000	
	ACTIVITY PLAZA		1	EACH		5000					5000	
	CONCESSIONS & BIKE RENTAL		4	SET		15000					60000	
	SUBTOTAL										982450	
	CONTINGENCY										294735	
	TOTAL										1277185	

TABLE 7: (Continued)



COST ANALYSIS

PROJECT CENTRAL PARK & PEDESTRIAN/BIKING PATH SHEET NO. 5
LOCATION MAH-MADE ENVIRONMENT WITHIN LAWRENCE RIVERFRONT ESTIMATE NO. 5
LANDSCAPE ARCHITECT EMILY (FERHG) LO OWNER DATE JUNE, 1980

QUANTITIES BY		PRICES BY		EXTENSIONS BY				LABOR		CHECKED BY	
DESCRIPTION		QUANTITY	UNIT	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL	Prof. PAGE	
BIKING		4.5	MILE		20000						
SIDEWALK		24000	SQ.FT.		3						
CENTRAL PARK											
POOL (ICE-SKATING AREA)		1	EACH		15000						
CONCESSIONS		2	EACH		10000						
BASEBALL COURT		2	EACH		15000						
PARKING		960	SQ.Y.		10						
OPEN SPACE LANDSCAPING		4	ACRE		10000						
SUBTOTAL											
CONTINGENCY (30%)											
TOTAL											

TABLE 7: (Continued)

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APPENDIX A

COMPARISON BETWEEN HISTORIC DEVELOPMENT OF AMERICAN AND
EUROPEAN RIVER USE IN CITIES

<u>European</u>	<u>American</u>
1. Railroads do not thread through city; end at terminals	1. Railroads dominate riverfront
2. City develops with equivalent potentials on both sides of river	2. City develops more on one side than other
3. Greater number of bridges allows for dynamic use of both river banks	3. River is considered as a barrier
4. Significant avenues not intercepted by river, but run concurrently with complementing vistas	4. Grid patterned streets usually conflicting with riverbends
5. Impact of riverfront reaches farthestmost inland	5. Little or no expression of central business district on riverfront

APPENDIX B

CONCLUSIONS OF THE RIVER WALK, SAN ANTONIO, TEXAS

The River Walk is Unique

Special historical circumstances and physical characteristics set the River Walk apart as a singular environment. It is special because, unlike most city parks, it contains a mix of public parkland, attractions, and a variety of commercial establishments. It offers a strong downtown focus for a wide diversity of leisure activity and cultural enrichment, both day and night, for a wide range of users, both local and outside.

The River Walk is a Unified Whole

The horseshoe bend virtually forms a circle of interest far stronger than a linear setting. The recessed corridor below street level forces attention inward and isolates the River Walk from the central business district, of which it is a part. The design of both landscape and structures has continued the informal yet orderly theme set by the old river and early Spanish influence.

The River Walk Contains Diversity

The fragmentation of ownership, development and control has resulted in a high degree of diversity. Visitors participate in a variety of activities from lounging and relaxing to religion, education, entertainment and shopping--all in a beautiful setting.

A Delicate Balance Exists

The park and commercial development appears to be in a state of delicate equilibrium at the present time. Actually, the mix is so tastefully handled that each force seems to complement the other rather than compete. Those seeking the restful beauty of natural landscape and water appreciates easy access to food, lodging, entertainment and shopping. The businesses are more rewarding because they are located in an attractive setting.

The River Walk has Great Social and Economic Value

All visitors are fully conscious of the beauty and leisure quality of the River Walk. It not only brings regular visitors from great distances but draws many local residents. Few civic investments anywhere could equal the popular support of the River Walk.

A Dynamic Future Lies Ahead

The overwhelming success of the River Walk suggests that the present physical situation and management policies should be retained. However, any city is in constant dynamic flux and as much change is possible in San Antonio as elsewhere.

Changes in surrounding land uses could greatly influence the future success of the River Walk. Increased development of attractions in the vicinity and linkages with the present development would undoubtedly strengthen the power of the total attraction. On the other hand, great increases in the volume of use of the River Walk could pose a threat to its quality. Even now, masses of users at special events force maintenance authorities to fence off planted areas to keep them from being destroyed. Increased residential development around the River Walk might be highly compatible.

River "improvements," both upstream and downstream from the River Walk, as well as possible channel extensions, are looked upon with favor but it is doubtful if they can replicate the impact of the River Walk as a single attraction. New and different focal points can be found and throughout the city landscaped river linkage would be desirable but these would be additions, not necessarily replicating or competing with the River Walk.

The River Walk Has an Atypical Physical Setting

Few cities have similar riverfront circumstances. Most cities face onto much wider rivers, reservoirs or lakes. Furthermore, many urban riverfronts are low-sloping rather than enclosed by high banks. Therefore, the intimacy and

overall unity of the River Walk is difficult to replicate except where similar circumstances are found or can be developed. Key to the success of the River Walk is the stabilization of the water level, directly within a natural flood plain. Contrary to many urban rivers, the San Antonio River is not used for shipping or harbor activities.

A Refocus Upon Downtown Can Be Accomplished.

Contrary to decentralizing trends nationally, the River Walk has proven that urban water development can provide a base for major urban revitalization. Inspection of business and cultural development surrounding the River Walk clearly shows a general halt to urban core blight and renewal of interest in downtown. Several proposals have been made recently for major investment in housing and business complexes.

A Small Amount of Water Can Be Powerful

The River Walk demonstrates that quality of development is more critical than quantity. Comparatively little water surface forms the core for all development and activity. In fact, its small size actually increases its utility because both sides of the river function, visually and physically.

Composite Management Can Succeed

The River Walk controlling agencies and organizations as well as the property owners demonstrate that a diverse aggregation of decision-makers can collaborate and cooperate for mutual good. Instead of fostering a single managerial agency, they have retained their individual identities at the same time they have formed a cohesive operational unit.

A Business-Park Mix Can Be Functional

Contrary to most park or business development taken separately, the River Walk shows that the amalgam is a very worthwhile and workable approach. Most park philosophies are anti-commercial and most business enterprise sees

little commercial value in parks. The complementarity of the two is perhaps the most dramatic accomplishment of the River Walk development.

Diversity is Successful

Few civic developments include more than one purpose--people drive to, park, and use the facility for one function only. The River Walk shows that a great diversity of leisure and cultural activities can take place in a single environment without conflict. In fact, this diversity accounts for much of its popularity.

Internal and Adjacent Land Uses Must be Compatible

If the River Walk had to contend with massive industrial plants that created environmental problems--odor, noise, toxic waste, congestion--it would be in great difficulty. Although diverse functions do take place in downtown San Antonio, they are primarily of four human-use types: cultural, commercial, recreational and housing.

Both Tourists and Local Citizens Participate

Contrary to many urban developments that are built only for local citizens because they are supported by local tax money, the River Walk successfully serves both tourists and residents. It is a civic improvement of great pride, intimately belonging to the citizens. At the same time, it draws thousands of outsiders who appear to mix well with local visitors. The voting residents show a remarkable willingness to provide tax support for such a civic asset.

Provide State Tourism Stimulus

There is little question that the River Walk now is one of the major attractions for tourism for the state of Texas. Other cities may not be utilizing similar assets as destination possibilities for traveler interest.

While much national travel is oriented to extensive rural and remote areas, city attractions such as the River Walk have equal appeal for many.

**LAWRENCE RIVERFRONT REGION
A SUGGESTED URBAN REVITALIZATION**

By

EMILY SHIUH-FANG (FERNG) LO

B. Arch., Taiwan National Cheng-kung University, 1975

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture

**KANSAS STATE UNIVERSITY
Manhattan, Kansas**

1980

Due to the change of our transportation method, the existence of deterioration on the urban riverfront region is so evident that in most cases the riverfront no longer can claim the position of being a vital part of its economic life. The primary purpose of this thesis is to suggest that riverfront redevelopment is indeed the method of creating a new resource of economic life, namely, to attract a variety of daytime and evening users into the downtown area and keep the neighborhoods populated with active citizens.

This research aims at the understanding of the present trends in urban riverfront redevelopment as manifested in selected case studies. Hopefully, learning from these studies would help reveal the significance of my case at Lawrence riverfront site. Other design guidelines pertaining to the purpose of urban growth, physical and aesthetic considerations would help in solving the problems in this Lawrence project. It is expected that Lawrence's comprehensive long-range plan, Plan '95, would provide an essential guide for the future development and set the synthesized priorities of basic immediate improvements and long-range needs.

The suggested Lawrence urban riverfront redevelopment project consists of two parts: the renewal of man-made environment and the improvement of a naturalistic shoreline. The highlight in most of our river cities is the enhancement of their existing buildings and stimulation of activity near the rivers. Here in Lawrence, Kansas, or elsewhere, the neglected riverfront, while often obsolete for its original use, is a splendid opportunity for urban redevelopment. With an understanding of the region's assets, this writer attempts to utilize the existing natural and man-made facilities and turn them into real amenities within the overall context of the riverfront's uniqueness. Creation of a good housing and recreational environment through commercial environment for Lawrence residents and visitors is the major concern.