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AN APPROACH TO URBAN RIVERFRONT DEVELOPMENT
A CASE STUDY ON THE KENTUCKY RIVER
FRANKFORT, KENTUCKY

by

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INTRODUCTION

INTRODUCTION

The beauty of water and all of its many forms is legendary. From the quiet, placid lakes high in the Rocky Mountains to the thundering cataracts of Niagara Falls, such waters as these have inspired countless works of art and poetry. For the utilitarian values of water, most of America's great cities have been built on rivers. Whether for recreation or inspiration, Americans throng to the water's edge, to take part in water sports, fishing, and sight seeing.

With the early exploration and settlement of the American continent, such famous rivers as the Hudson, the James, the Mississippi, the Missouri, the Columbia, and many more, were the first trails to the interior. Since then these rivers have become the sources of power, water for domestic and industrial use, and water-ways for commerce and recreational opportunity.

Today, very few of these rivers remain untamed or unpolluted by man. Many were harnessed without adequate thought for their scenic, recreation or fish and wildlife values.

In the last decade, Federal Legislation has been carried out to retain and restore the natural values of our nation's rivers, such as:

"The Water Resources Research Act of 1964" authorized financial support to a water research center at a university in each state. Specific projects for research includes a search for better way to estimate demand for "non-market" water resources like boating and sport fishing.

"The Water Quality Act of 1965" increased the amount of grants available to municipalities for water pollution control. It also established the Federal Water Pollution Control Administration to administer the grant program and review and enforce quality standards.

In the "Water Resources Planning Act of 1965", the Congress established a policy of encouraging the conservation, development, and utilization of water and related land resources on a comprehensive and coordinated basis by the Federal Government, states, local cities, and private enterprise.

In 1966 the Congress directed the Secretary of the Interior to cooperate with the states of New York, New Jersey, Massachusetts, Vermont and Connecticut, to develop, preserve, and restore the resources of the Hudson River and its shores. Most recently, in 1967, the President's Task Force for the Potomac River Valley presented its findings, the highlights of which called for:

- a) A new approach to land use based upon respect for environment and recognition that the landscape represents the interaction and interdependence of many natural processes;
- b) A comprehensive ecological inventory of the Potomac Basin to balance resources against demand and to serve as a framework for planning decisions;
- c) A new concept of zoning which has as its objective ~~the~~ conservation of nature and its processes rather than obtaining the maximum number of building lots;

- d) The development of new towns along the river, using the riverfront not only for recreation but for civic and commercial town centers;
- e) The establishment by the Congress of a Potomac Development Foundation to provide leadership in carrying out a plan for the protection of the Potomac Basin, to develop a comprehensive plan for its development, and to make development loans and hold lands for subsequent lease or sale according to the comprehensive plan.

Following closely from the previous legislation has been the controversial "National Wild and Scenic Rivers" legislation. This legislation, both state and federal, seeks to identify, evaluate, and protect scenic waterways through the efforts of the various units of government and joint public-private efforts.

Much of the legislation that has been mentioned treats the broad spectrum of problems relating to our national rivers, but very little has been directed specifically to the problems which deal with the development and/or redevelopment of our urban riverfront areas. The problems of our urban riverfront seem to be paramount since our urban development along these rivers contribute to much of the source of problems which we now have.

It is therefore the intent and purpose of this research to investigate the source of these problems and illustrate a logical approach to formulating an empathic urban land use and physical redevelopment approach to our urban riverfronts.

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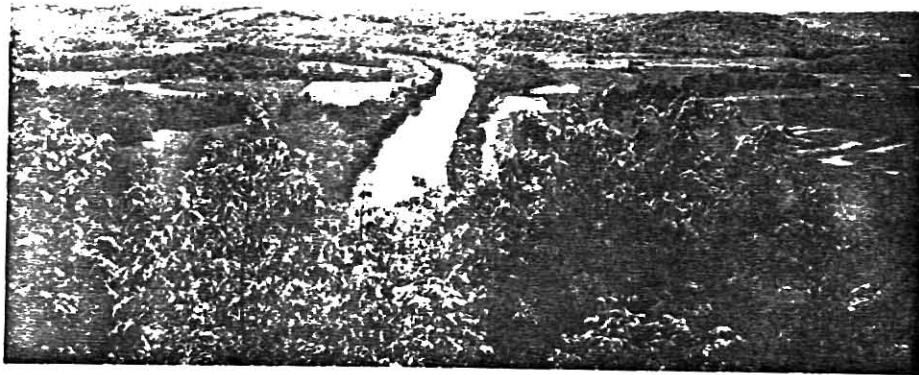


Fig. 1

View of Kentucky River Valley, Northern Kentucky.

I. URBAN RIVERFRONT PROBLEMS

A. Historical - Location of Cities along Rivers

The river is and always will be one of man's most valuable natural resources. Since biblical times man has looked to the river in its many forms as a source of food and water, potential energy, navigation, recreation, and a place to cleanse ones self. Our rivers form the main arteries which carry the life sustaining substance, water, back to the sea where it is transformed into water vapor and is carried back to land in the form of rainfall completing the cycle. Within this cycle, during which the water is being carried by the rivers, man has exploited the river for his own uses.

Historically rivers have played such an important part in the growth of our nation that much of the wealth and prosperity which we now have would not have been attained had this nation not been endowed with its many rivers and streams. These same rivers and streams not only supported basic necessities of life, but provided a means for transportation for pioneers and their trade goods. Quite often the river provided a natural barrier against a hostile people and within the same vein, the river became an obstacle which had to be crossed, endangering the lives of the early settlers.

The river has been an asset and a detriment to man. Spring rains and the melting of snow, often forces the river to swell out of its banks and become a raging torrent dealing death and destruction to everything in its path.

The ingenuity and persistence of man has enabled him to harness the river and control it to the extent that in most cases it no longer presents a constant danger. As man has seen the river benefit him more than hinder him, he has seen fit to live within its valleys and watershed, to build cities, and form boundaries along its banks.

Kansas too is a state which has literally grown up along the river. Many Kansas towns for the most part, have been established along the major rivers and tributaries. Of the 622 cities and towns in Kansas, 174 have developed along or adjacent to a major river. Some of the largest cities such as Kansas City, Wichita, Topeka, Salina, Hutchinson, Lawrence, Leavenworth, Manhattan, and Junction City were founded along the major rivers of Kansas.

During their early history, many of these Kansas towns relied heavily on the river as a source of navigation to bring people and trade goods to the markets. As many as 34 steamboats once traveled the Kansas river from Kansas City to Fort Riley, carrying passengers and freight.

Navigation was a problem which many of these vessels encountered. Hidden sand bars were a constant hazard which confronted all steamboat captains. The "Lightfoot", a boat intended for the Kansas River trade, took more than a month in 1857 to make a round trip from Kansas City, Missouri to Lawrence, Kansas; "the greater part of the time being spent upon sand bars." A few steamers attempted to operate on lesser rivers, particularly the Arkansas in the 1870's and 1880's but these efforts, for commer-

cial purposes, were inconsequential.

Atchinson and Leavenworth, Kansas became booming towns handling river freight. These great quantities of freight in the shape of thousands of wagons, ox-yokes, mining machinery, and other materials were all necessary provisions to supply the great number of people flocking to the great west.¹

The most common occurrence of river travel was the ferry boat. These flat bottom boats, propelled by poles, oars, cables, horses and eventually steam, served as a means of river crossing prior to the building of bridges.

In the gay ninties, people found the rivers an enticing place for a pleasure boat ride as was the case in Valley Falls, Kansas, where on a Sunday afternoon one could take an excursion boat ride up the Delaware River.

Many Kansas communities saw fit to locate their public parks along the river. This offered a natural setting as well as the fascination and attraction of water. To the Sunday stroller, it meant a place of quiet relaxation in the shade; a place where the sparkling fluid movement of the water provided an atmosphere for a quiet afternoon of fishing or contemplation.

The riverfront park has been one of the most popular urban parks as is the case in many cities across the United States. Such famous parks as Fairmount Park, along the Schuylkill River in Philadelphia, Pennsylvania was designed in 1868 by Frederic law Olmstead. The serpentine nature of the river is reflected

B. Changes in Riverfront Uses

The ravages of flooding and the enormous cost of rebuilding has turned many communities away from the river. The undesirable and often forsaken urban riverfront has become a dumping ground for city waste, a servant of industry and a menace to be dammed and diked. As the river flows through the urban community, the once pure water is now polluted with city sewerage, industrial wastes, and a multitude of pollutants draining from upland farms and mines.

Water pollution particularly discourages usage of riverfront land for residential and commercial uses. The odor and sight of a cluttered river is as much of a deterrent to development as flooding.

The urban riverfront, like any other section of the city, has been an active functioning area. Like any other portion of the city, it has become a victim of change and an object of complacency. The decline in riverfront uses for industrial land and central business has permitted many undesirable uses to creep in. The industries once located in the central portion of the city have left due to the lack of available space for expansion. This vacuum is often filled by junk yards and land fills.

The old power plant and mill are of no particular use now, they stand decaying and rotting away at the water's edge. Vacated warehouses, mills, railroad sidings and refuse dumps are slowly being engulfed with weeds and brush. To anyone's senses, this is the sight and smell of blight.

in the entire layout of walks, drives, and open spaces.

The location of fashionable homes along the river was once the case in many cities and towns. Riverside, a Chicago residential subdivision planned by Frederic Law Olmstead, was an example of Olmstead's efforts to relate urban development to the natural environment.

The riverfront and adjacent land has also been an attractive location for industry. The flat river valley offered minimal site preparation for structures needing a level base plane. Wells for water were conveniently drilled and the water once used could be disposed of readily along with other industrial wastes by simply piping it to the river. The accessibility of the river for shipping large quantities of manufactured goods and raw materials gave additional impetus to industrial location.

The river also provided a necessary source for potential energy. Dams were built to accommodate the mill which ground the farmer's grain or the generating plant which provided electricity to the city.

The ferry crossing and the adjacent trading post gave way to the steel truss bridge and the central business district; the paddle wheeled steamer and the docks have given way to the river pleasure craft and marinas.



Fig. 2

Trash dumping along riverbanks, Wichita, Kansas.



Fig. 3

Broken concrete and brick along Arkansas River.

C. Riverfront Blight

Riverfront Blight is the physical decay and ugliness that infects and spreads along the urban riverfront. This phenomenon is evident in many American communities where the urban center is located near a river.

Characteristically this cancerous effect on structures, land, and water may be identified by decadent structures, debris and trash laden riverbanks and polluted water. Eroded riverbanks which have been stock piled with rusting auto bodies, broken concrete and brick typifies some of the vain attempts at controlling the problem of erosion. (See Figures I and II)

These areas become subject to infestation from rats, mice, and other disease carrying mammals and insects making them restricted areas for anyone's use.

As blight does not isolate itself in any particular part of the city, it can spread like a malignant growth until it involves every adjacent area in its path. Recognizing the problem in its initial stages and attacking it with laws, zoning, and preventive maintenance would provide a means for containing its spread.

To some, the ugliness may not exist and cannot always be equated as blight or decay. One man's trash is another man's gold, as the saying goes.

Some functions exist out of necessity and therefore cannot be referred to as decadent. Though esthetically not pleasing in their form, they must be there. These functions may be such items as pumping stations, power plants, sewage treatment plants, grain elevators and holding yards.

D. The Causes of Riverfront Blight

The greater portion of Riverfront Blight has occurred as a result of changing land use, transportation, and use of the river itself. The blight begins to worsen when the condition of buildings, shore line structures, and the landscape are ignored and are left in the state of unrepair.

A large portion of the riverfront oftentimes receives little of the public's attention due to the fact that it is inaccessible because of barriers cutting off the public access. These barriers may be railroads or expressways which parallel the shoreline too closely. Natural and man-made barriers such as flooding, pollution, and changes in the natural shoreline affect the usefulness of the river.

Conflicts between waterfront land uses can cause blight. A waterfront factory, whether blighted or not, may be detrimental to other surrounding areas, if it is not located in a suitable industrial district. Power plants and water treatment plants oftentimes located adjacent to the river, are indiscriminant to their locations because their proximity to the river is out of necessity. The very nature of their operation and physical form has in the past made them visually undesirable.

One of the seemingly less obtrusive problems, yet contributing to the appearance of the riverfront, are the many bridges in every shape, size and condition. Railroad bridges, vacated and obsolete because of rerouted rail lines, are esthetically displeasing and therefore represent another type of blighted ele-

ment in the riverscape. Street bridges can easily fall into the same category. Bridges, out of necessity, have to be functional but do not have to be ugly in their form.

Blight may also be in the form of public ignorance as to the conditions of the river and adjacent areas. The public tends to recognize undesirable conditions when they become a general nuisance, and, then, it is usually quite late and too costly a burden to improve without the aid of the Federal Government or costly bond elections.

Blight is usually not found along the entire riverfront nor does it occur in the same way as blight in any other part of the city. It is usually found in areas thought to be "healthy".



Fig. 4

Untreated industrial waste being dumped into Arkansas River, Wichita, Kansas.

II. PHYSICAL LIMITATIONS OF RIVERFRONT REDEVELOPMENT

A. Water Pollution

Water pollution is one of the major limitations to the use of riverfronts for any use. Adverse changes in water quality result in lost opportunities and increased costs for subsequent users of water. Some of the losses which may be attributed to pollution include: (1) curtailment of recreational uses, (2) increased water treatment costs, (3) loss of industry, (4) corrosion of boats and structures, and (5) reduced property values.

Impurities in water do not always impair its usefulness. Dissolved minerals, suspended particles (silt) and algae (minute aquatic life) result from natural phenomena and were present before man arrived on the scene. Man-made pollutants resulting from an acceleration of natural processes by man's activities are represented by the discharge of organic wastes into streams which provide more nutrients and foster algae growth. (See Figure III)

The silt carried by a stream is made up of inorganic solids such as fine soil and rock particles. The measure of silt carried by a stream is referred to as turbidity. The effects of turbidity usually gives the river a cloudy look. This phenomenon is present in most rivers and streams where upland drainage over farmland or unprotected soil causes the soil particles to go into suspension, thence they are transported to the major streams.

The short-range effects of high turbidity is a danger to all types of fish.

Chronically turbid waters are lost as fishing places because turbidity restricts the field of vision of species of fish which are sight-feeders. Tests have shown that fish can endure exposures to 100,000 p.p.m. of turbidity for a week or longer, but finally die at turbidities of 175,000 to 225,000 parts per million.²

The long range effects of turbidity result in the siltation around the back-water of reservoirs. Here the stream loses its velocity and the suspended particles settle out, forming deposits of mud and/or silt. The results can be costly when dredging operations are required to remove the silt deposits. The visual aspects of turbid streams discourages their use for many types of recreation. The appearance of a "dirty stream" carries many connotations with it, and, therefore, the general public may tend to shun this type of stream.

Most states having water quality criteria for recreation have set maximum limits for turbidity due to its importance for safety from drowning. For instance, the maximum limit of turbidity in California is 20 p.p.m.

Several of the other water quality factors which affect the human senses are detectable tastes, odors, scum, oil and grease. These factors, too, are well defined as to tolerable limits by most states having water quality regulations.

One of the most critical and highly regulated factors of water quality are Coliform Bacteria and Dissolved Oxygen Content. Coliform bacteria are predominantly inhabitants of the intestinal

tracts of warm blooded animals. Although harmless in themselves, they indicate the possible presence of more dangerous but less frequent intestinal bacteria. Criteria of tolerance will vary depending upon the water use. The Kansas State Department of Health and Environmental Health Services state in their "Water Quality Criteria for the Lower Arkansas River Basin" that "The objective for coliform bacteria shall be less than 20,000 per 100 m.l. sample at the point of intake for public water supply purposes. This quality should not be confused with the number of coliform organisms present during surface runoff, since at such time they may be primarily soil organisms not indicative of sewage or waste pollution."³

"In areas designated for body contact recreation, the objective for coliform bacteria control is established at less than 1000 coliform bacteria per 100 m.l. sample."⁴

The Dissolved Oxygen content of any water body is directly related to the marine life it will support and the natural self cleansing properties. Dissolved oxygen in one sense, is the life blood for water. It not only is necessary to sustain fish, but it must be present in suitable quantities to purify both natural and man-made organic wastes. In order to maintain this critical ecological balance, oxygen must be present to support the natural bacteria which break down organic wastes. Once the level of dissolved oxygen drops below the minimum tolerance, all aquatic life forms suffer.

A prime example of this delicate situation has occurred in

Lake Erie, according to all reports, is dead. The processes which lead up to this disastrous condition exist all across this nation. According to published reports in national magazines and newspapers, this ecological imbalance was created by a combination of untreated industrial wastes, deadly chemicals, and sewerage. This collection of man-made wastes robbed the lake of its natural oxygen thereby killing the fish, bacteria, and aquatic plant life.

This delicate balance is being endangered in our rivers and streams when untreated wastes, of any type, are allowed to be dumped into a water body, especially those water bodies which are used for drinking water and recreational purposes.

In a personal interview with Mr. Richard Stroud, Executive Secretary for the National Sport Fishing Institute, held in September, 1968, Mr. Stroud stated that "the industrial pollutants, such as mercury and pesticides such as DDT, are killing our game fish at such a rate that it is impossible for the fish hatcheries to replenish the loss. The Coho Salmon, which are now replacing some of the losses of the native lake trout in Lake Michigan, still carry enough DDT in the body fat that the state cannot allow commercial fish sales for human consumption."⁵

When asked about the causes of an ecological imbalance in our lakes and streams, he stated that, "an unpolluted water body, which is hard to find today, will support all aquatic life by means of a food chain. This chain basically begins as a proper balance of aquatic plant life, oxygen, (free oxygen) micro-

organisms, and various bacteria. As the bacteria utilizes part of the oxygen to break down organic matter, it gives off carbon dioxide. The carbon dioxide, in turn, supports the plant life, which, in turn, replenishes the water with free oxygen. Fish, then, rely on the free oxygen for breathing and the plant life for food. If any part of this interdependency is not in balance, it affects the total chain."

"One of the most valuable natural occurrences in any water body is its natural cleansing ability. Too much organic material from untreated sewage requires more free oxygen for the bacteria and the result is disastrous to the fish population. When the fish population is low, the plant life may increase to the point that it can literally choke the water body. Other factors such as water temperature also enter into the picture."⁶

Biochemical oxygen demand (B.O.D.) is a scale for determining water purity. As defined, it is the measure of the amount of oxygen consumed in the decomposition processes of organic matter in water in a specified time and at a specified temperature (usually 5 days at 20 degrees centigrade and expressed in parts per million).

Boating requires yet another set of maximum levels of pollution. Water used primarily for boating should not have an objectionable color, odor, or floating and submerged solids. Floating debris is especially dangerous to the water skier as well as to the hull and motor of a boat.

Standards set by the Interstate Commission on the Potomac River Basin are indicative of minimum quality requirements for

boating and camping. The standards are as follows:

pH value	6.0 - 8.5
5-day B.O.D.	Monthly average, 3.0 p.p.m. or less; Maximum sample, 5.0 p.p.m. or less
Dissolved-oxygen	Monthly average, 4.0 p.p.m. or more; Daily minimum, 3.0 p.p.m. or more; Absolute minimum, 2.0 or more
Others	No toxic substances, oils, tars or free acid at any time; no solids or debris, except natural; slightly localized sludge deposits if unpreventable; and no offensive odors

The purpose of the limited pH range is to prevent the corrosion of watercraft surfaces. The B.O.D. range and dissolved-oxygen ranges are to eliminate the odors or putrefaction. The elimination of various floating materials is to make the water esthetically acceptable.⁷

For most industrial uses, reasonably clean and silt-free water is required. 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. Lake water is generally more suitable.

B. Air Pollution

Today, the air pollution problem is receiving enough significant attention that it has become one of the major factors in planning our urban areas. Industry, as in most cases, is criticized as being the chief contributor of air pollution. This may or may not be true, but in order that we are able to attack the



Fig. 5

Flooding of Kentucky River, Frankfort, Kentucky.

problem from a planning standpoint, it will be necessary to (a) reduce existing sources of air pollution by enforcement of federal, state, and local laws and (b) plan to prevent or reduce emissions from new sources.

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.⁸

C. Flooding

Flooding and flood control has seemingly been with man since Noah's Ark. The Egyptians along the Nile River have lived with flooding, and while doing so, sustained their civilization for thousands of years. It has been in the last century, only, that man has seen fit to harness the river by dam and by dike in order that he may enjoy a flood free society. (See Figure IV)

The major portion of American cities dealing with flood control problems have utilized the dike, levee or the flood relief canal. These earth structures may take up tremendous amounts of riverfront and urban land in order to control flooding. Esthetically, they are not always the most pleasing, hence, man suffers the loss of the natural landscape and turns his back on the weeds and the ribbons of rip-rapped embankments.

Today we have more than one approach to the problem of flood damage prevention. One is to control the extent of flooding by

constructing dams, reservoirs, dikes and other protective works. The other approach is to reduce the damages by changing the use of the land to those uses least affected by flood hazards. Almost all attempts to solve flood problems have been devoted to the use of flood control structures. Regulation of land use in flood-hazard areas is now being recognized as a vital tool in damage-prevention programs. Preventive land use measures include the use of flood plain zoning, subdivision regulations, and urban renewal.

The flood plain problem is significant from the standpoint of waterfront renewal for two reasons. First, reuse of waterfront areas would be limited by flood plain considerations, and secondly, the urban renewal technique could be used to clear run-down waterfront structures subject to periodic flood damage.⁹

In the final problem analysis, we now have the awareness and know-how to incorporate esthetics, environmental balance, and engineering into flood plain planning.

D. Soil Conditions

The geological history of a river valley will tell much of the problems to be encountered with alluvial soil conditions. A good understanding of the geological history will help in knowing previous channel locations. For instance, a river, in the course of its natural erosion and deposition of the earth's surface will take the line of least resistance as gravity pulls the water to the lower elevations. Natural movement in the earth's crust also helps to alter the stream's course. The sum

total of physical phenomenon occurring through time forms the river valley by means of the more wear resistant side slopes. The alluvial flat plain is created by the deposition of fine rock particles.

Organic matter which decomposes along with the natural break down of rock particles creates a soft and plastic soil which will settle and lose resistance when loaded. The ability of the soil to bear loads is measured by the bearing capacity. This is expressed as the average load per unit area which will not cause more than a specified amount of settlement.

Soils will have a definite effect upon the type of architectural structure and its bulk, height, and type of footings. For high rise structures, the problem can be more complicated. Unless a stable bearing material can be found at a reasonable depth, pilings will have to be driven into solid rock. In selected areas where it is not economically feasible to use pilings, high rise structures are limited.

Various urban riverfront developments may be affected by soil movement. Soils move up, down, and sideways. Soil movements that occur in natural ground are completely unrelated to any man-made development. 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 variations in moisture conditions.¹⁰

One of the biggest problems, related to instability of soils

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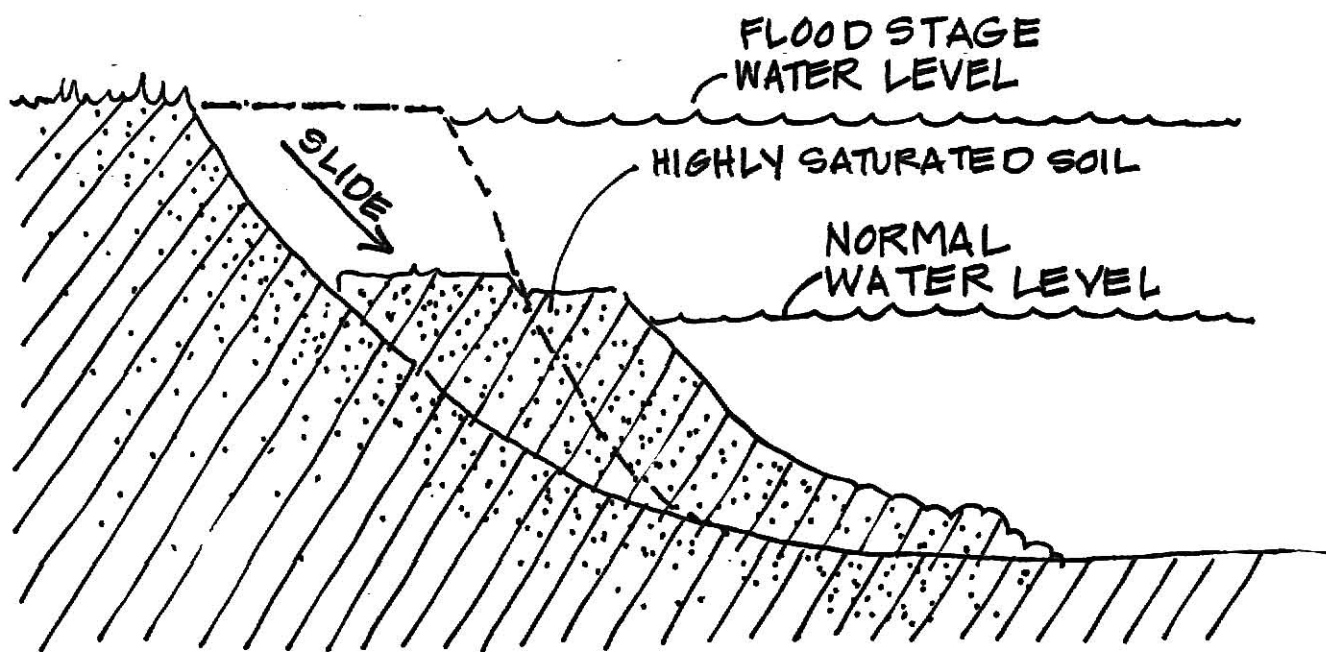


Fig. 6.

Effect of saturated soil along riverbanks after high water.

along a stream, results from an increase in soil moisture, either from rainfall or a rise in the stream flow. The additional water content of the soils affects their stability in two ways: (a) the water adds to the weight of the soil, which increases the gravitational forces tending to cause a slide; and (b) the water usually lowers the strength of the soil, which must provide resistance to the down-hill sliding motion. (See Figure VĪ)

This process occurs along a stream when an increase in stream flow saturates the stream banks above normal water level. If the water recedes too quickly, the upper banks will be forced to slide by gravitational force, since the pressure and weight of the water soaked soils are no longer equalized.

It is not uncommon to witness this occurrence just after heavy spring rains. Large trees and tons of soil slide into the stream channel, where they become a danger to navigation, recreation, and shore line structures.

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

I. Soil or rock type:

A. Stability

B. Difficulty of Excavation

C. Suitability for fill

II. Water:

A. Surface Water

1. Causes:

(a) Rainfall

- (b) Irrigation
- (c) Evaporation

2. Effects:

- (a) Run off may be increased
- (b) Erosion and silting
- (c) Flooding

B. Subsurface water

1. Causes:

- (a) Rainfall infiltration
- (b) Evaporation
- (c) Subsurface seepage

2. Effects of increased soil moisture:

- (a) Stability (landslides)
- (b) Downslope soil creep
- (c) Volume changes
- (d) Impaired plant growth

3. Effects of decreased soil moisture:

- (a) Subsidence of ground
- (b) Shrinkage of upper soils

III. Excavation and Filling

A. Slopes:

- 1. Design to anticipate maintenance.
- 2. Design to provide safety for structures.¹¹

E. Stream Hydrology

Soils and hydrology are the two most interdependant factors relating to riverfront development. Soils affect land use that

relates to water front use and hydrology affects the water use relating to the land use.

Stream characteristics such as the normal depth, width, and velocity will affect most, if not all, planning considerations for the recreational uses. The width and depth of a stream will determine the amount and type of boating activity. If the flow line gradient of the stream is too great, this could preclude the use of the stream for pleasure boating but may not exclude the popular sport of canoeing.

Streams which have previously been used for commercial and industrial navigation purposes are usually of a size and nature that most water-borne recreational activities can be accommodated. At the same time, there are streams which 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.

For example, the Arkansas River which flows through the city of Wichita, Kansas is physically large enough to carry enough water to allow for boating, but by the nature of its normal summer stream flow, its existing condition of shallow water and sand bars, it could not accommodate boating activities.

A 1967 feasibility study prepared by R. S. Delamater, consulting engineer from Wichita, Kansas, proposed that an inflatable dam or dams could be located in such a manner that a suitable water depth could be maintained for esthetic as well as recreational purposes. During periods of high water flow, the in-

flatable dam can be deflated to allow the excess water to flow freely without causing damage to the dam structure or flooding of adjacent land. (See Figures VII. & VIII)

Other limiting factors, relating to the normal water flow of a river, relates back to the problem of pollution and siltation. The stream body must carry enough water in order that it may dilute pollutants below the danger level. If, during normal flow and with proper monitoring, the stream quality is acceptable, then impoundments for recreational purposes are feasible.

The problem of siltation was also discussed by the R. S. Delamater feasibility study in which he states that; "as the river rises, the bottom goes down". What happens is that at flood stages the sand in the stream bed, stirred up by the current, rises off the stream bed and goes into suspension. This suspension effect lifts the silt and fine material off the bottom and sides, exposes clean sand below the river bed so that the water in the stream can easily percolate into the sand. 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 water winds up on the top, very effectively sealing off the bottom and the banks, and in many cases practically water tight.¹²

Considerations for water evaporation may only be a limiting factor to impoundment design when the natural recharge of a stream is too low. This will be a factor in certain areas of the United States where seasonal drouths are present.

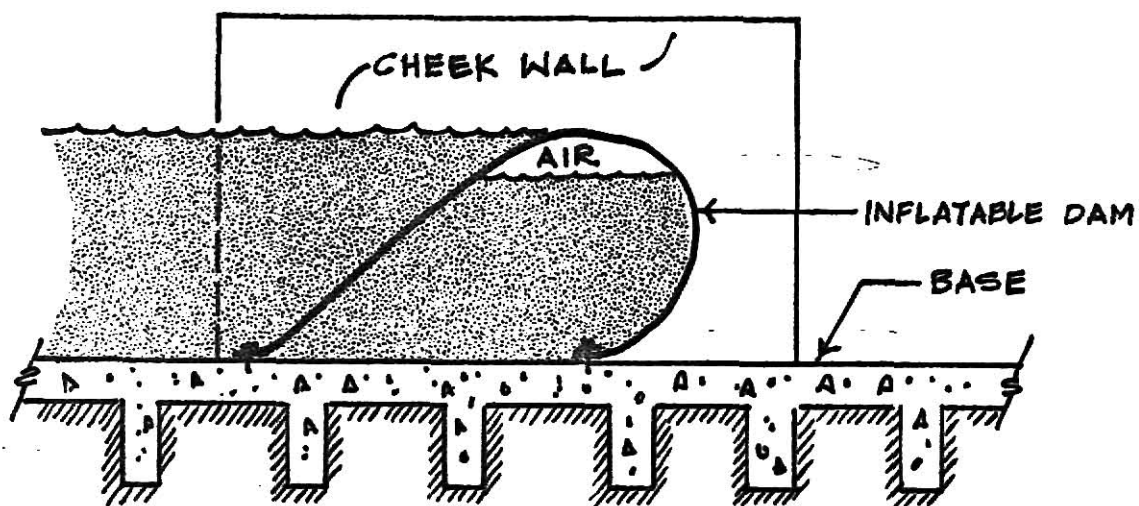


Fig. 7.

Inflated dam in normal operating position.

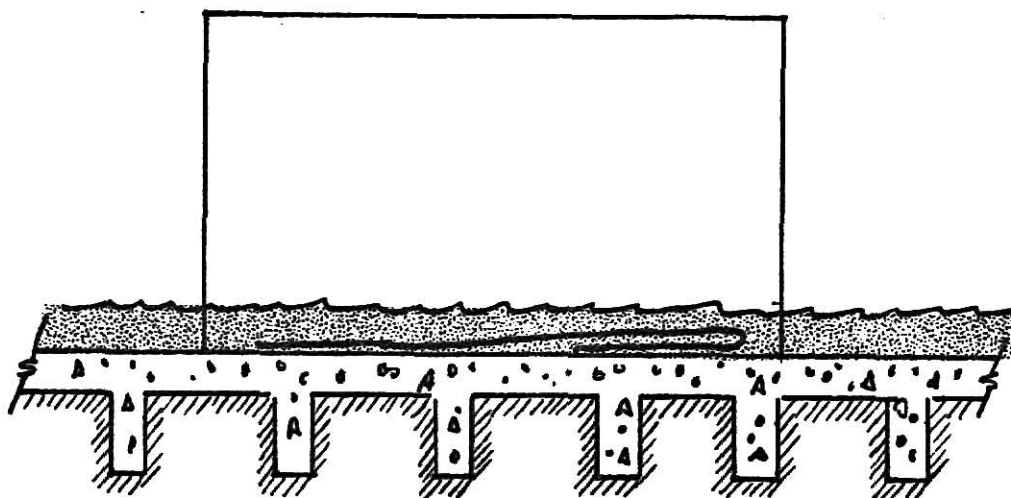


Fig. 8

Dam structure in deflated position.

F. Climate

Seasonal temperatures and atmospheric conditions may restrict the use of water and riverfront land to the warmer months. Land used for out-door cafe's, parks, and marinas can be used during the warm summer months only due to the nature of their use and operation. In some instances, a major effect of climate is to restrict the use of facilities to only one part of the year. Too often, the mistake is made when planners design for the summer months only in regions of the United States where summer is relatively short. Where it is economically and functionally possible, facilities should be planned to permit multiple use for year-round benefit.

Micro climates are of concern where 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 waterfront.

Where micro climates may seem to be limiting in some areas, they are, or can be, of great importance in other areas. For example, the smaller estuaries of a major river may offer unlimited possibilities for the development and preservation of natural areas which support unusual plant and animal life.

Climate, therefore, should be treated as a resource and as a guiding factor to development.

III. RIVERFRONT PLANNING

A. Planning Goals

Planning for new uses along the urban riverfront can be guided by a number of goals. When chosen, these goals should reflect the needs of the community as a result of conditions along the riverfront. The following are general goals.

Goal One. Pollution abatement of the river. The primary goal in any community's clean-up campaign should be the curtailment of any and all water pollution caused by the dumping of untreated effluent into the stream. Before a community may realize the full use of the stream, water pollution must be controlled at or below tolerable levels, especially if the stream is expected to be used for recreational purposes. Upstream control should be handled at the county or state level. Today most states have good water pollution control standards, but the most difficult problem is monitoring and policing the streams.

Goal Two. Develop visual and physical access. People can derive maximum enjoyment from the water when they have free visual and physical access to the water. The problem with many existing urban riverfronts is that they limit, if not eliminate, physical access to the water. The most common barriers to access are the streets, highways, and railroads which parallel the river. The amount of privately owned riverfront land is also a barrier. Barriers such as these may block room for expansion of riverfront uses and thus may doom the riverfront to gradual extinction.

In order that these problems may be avoided in the future,

the city can plan its heaviest traffic away from the riverfront, thus allowing local traffic to penetrate. This will lower the barrier created by high speeds and high traffic volume.

Once physical access is achieved, visual access may be had also. Design features which can increase visual access may include reservation of a strip of land along the shoreline which would be free of structures blocking a view of the water. The land would then act as a space buffer between the river and the dense inner city.

Goal Three. Remove incompatible uses and re-direct community interest to focus on the riverfront.

By removing incompatible uses along the riverfront, the community is more likely to realize the potential of redevelopment. If, for no other reason, the undesirable uses have been the major deterrent to redevelopment. Undesirable uses may be present in the form of industries which pollute the land, air, and water, or they may be present in the form of decaying structures which are visually unpleasant.

Urban renewal is one of the best means available for the public to remove these problems. Once land has been cleared, use of bold design concepts can be utilized to tantalize the public's imagination and refocus their attention to the riverfront.

Goal Four. Develop recreation and leisure activities around the natural and man-made resources.

Development of all recreation potential can become one of the major focal elements of the community's attention. Recrea-

tion areas are especially attractive if they are adjacent to water. Water is one of the best resources available which can convey coolness and restfulness -- two very important esthetic ingredients for open space development.

Water-borne recreation such as boating, water skiing and swimming are attractive both from the standpoint of participation and viewing their activity from the shore. Being able to view these scenes can be carried out by providing shoreline walkways which may wind along the tree shaded riverbank to various activity areas, thus allowing the visitor to passively involve oneself in the mood and activity of the riverscape.

Man-made resources such as historical riverfront embarcaderos, old riverboats, and wharfs, can be rebuilt and/or preserved as useful parts of the riverfront environment. These elements will evoke the unique flavor and fascination of an older and more colorful era on the riverfront.

Goal Five. Develop controls to insure proper development and preservation of all riverfront areas for future generations.

Zoning laws, subdivision regulations, and building codes are examples of regulatory controls necessary for proper riverfront development. Many communities, faced with development, will find it necessary to draw up new ordinances which deal specifically with new waterfront problems. Included in the new ordinances would be controls for riverfront land use, shoreline structures, bulk and view zones, architecture and esthetics, surface water use, construction and maintenance, fill and

riparian rights.

Goal Six. Reconciliation of conflicting goals. During the planning process, various federal, state and local agencies will be involved in the planning process due to over-lapping jurisdictions. Coordination between these various agencies, on the part of the planner, is important to the planning for everyone's interests. At the various levels of government, there may be projects planned which would affect the riverfront development. Any duplication of efforts would be both costly and time consuming. The following table is a tabulation showing typical projects and the agencies involved.

<u>Project</u>	<u>Agency</u>	<u>Level/Gov't.</u>
Flood Control	U.S. Army Corps of Engineers	Federal
" "	Natural Resources	Federal, State
Water Pollution	Health Department	State, Local
Urban Renewal	Housing and Urban Development	Federal
" "	Urban Renewal Agency	Local
Land Purchasing-Urban use	Housing and Urban Development	Federal
" " Recreation	Bureau of Outdoor Recreation	Federal
Utilities	City water, sewer, and electric	Local
Water use	U.S. Army Corps of Engineers	Federal
" "	U. S. Coastguard	Federal

Fig. 9

B. Esthetic Considerations

The basic human interest in the amenities and attractions of water bodies, together with the kind of dramatic proposals which waterfront locations stimulate, result in a high degree of public excitement over waterfront development.¹³

In order that public interest is aroused and sustained, planning proposals should treat the riverfront as a source of pleasure for people of all ages, and more specifically, when there is an opportunity for intimate contact with the water. The pleasure derived from leisure activities is directly proportional to the variety of activities which are offered.

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

At night, the riverfront can become a show place of creative lighting, with the water distorting the reflected lights and colors into new patterns. The river is also a place where more somber, quiet and restful moods may be conveyed. Quiet, out-of-the-way places may be created to satisfy the urge to remove oneself from the hub-bub of city life.

The riverfront also offers the opportunity for the planner to capture some of the more historically significant occurrences which reflect the city's past as a river port. Although many of the unique riverfront activities and structures have vanished or lay in ruin, some of the old structures may lend esthetic value as symbols of the city's past and should be sought out

and considered for preservation.

The urban riverfront is usually the oldest part of the city. Perhaps, behind a gloomy screen of blight, genuine historic structures may be found, which, while not genuinely historic, evoke the unique flavor and fascination of an older and more colorful era. Sometimes historic preservation can go hand-in-hand with other esthetic goals. Restoring a group of old buildings can make the waterfront a more interesting place to visit, thus revitalizing the area. Blending the new with the old is a challenge, which, if successfully met, can create lasting esthetic value.¹⁴

There are two very good examples of cities who have restored, or are in the process of restoring, their historical riverfronts. These cities are San Antonio, Texas and Sacramento, California.

The real esthetic goal attained by the San Antonio community was the saving of the horseshoe-like river bend dividing the central business district. In 1921, a heavy flood caused extensive property damage and loss of life which "stirred serious talk of covering the stream with concrete and making a street above, with the bed serving as a sewer."¹⁵

Ensuing public opinion was aroused, and a concerted effort was made to save the horseshoe bend through the shopping district by the San Antonio Conservation Society, which was organized for that specific purpose on March 22, 1924.

In 1929, flood control structures, which saved the riverbend by protecting it from high water, were completed.

It wasn't until 1938, that the full aesthetic potential of the river was recognized. Through the efforts of citizens and civic leaders, the first real progress towards development of the riverfront for the sake of the river, were realized. Under the then established federal W.P.A. works program, a landscape architect was commissioned to prepare plans for the development. The results of these early improvements can still be seen today, which include riverside walks, steps, and arched bridges.

Since that time, San Antonio has made further great strides towards recapturing its architectural heritage in a newer plan developed during the 1960's. This plan is referred to as the "Paseo del Rio (Riverwalk) Master Plan Study." In this study, the plan provided for an "open space link" for three important areas which already existed in the central business district.

The basic approach in developing the full potential of structures (because of the importance of architectural rehabilitation) in the plan, was one of zoning occupancy according to noise or activity level. A progression was established which was commensurate with the existing development of walks, structures, and planting, proceeding from loud to moderate to quiet zones, in a relationship which generates linking of like interests and a change of pace along the riverwalk.¹⁶

Today, San Antonio citizens and visitors enjoy the mutual benefits as the city plays host to millions of visitors who enjoy this nationally famous riverfront and historical community.

Of all of the communities surveyed, this author found that

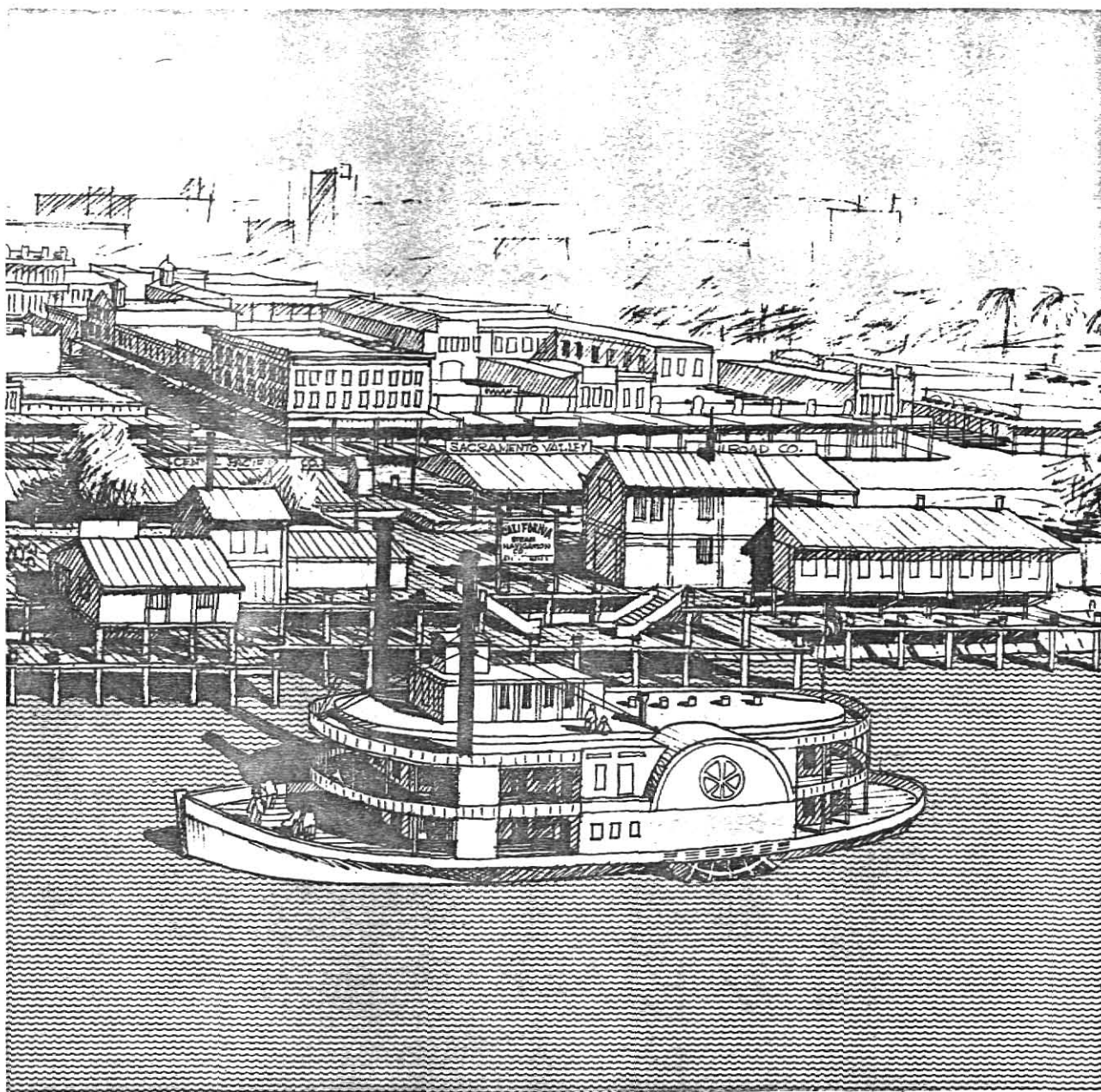


Fig. 10
Conceptual sketch of old Sacramento riverfront.

San Antonio was the only city having such a lengthy historic period of riverfront development.

In Sacramento, California, the inhabitants of the city are recreating the old Sacramento Embarcadero, which, between 1849 and 1970, was the central business district and busy riverport on the Sacramento River. Included in the restoration are 53 historic buildings built during the gold-rush period.

"Old Sacramento", as it is called, is located west and between the hard core of the central business district and the Sacramento River. Access to the area will be by means of pedestrian bridges and a separate traffic system which will enable the motorest to drive through the historic area without conflicting with the historical scenery.

"All esthetic considerations will be guided by an extensive file of historical research material relating to every building within the project area. When completed, the total complex will present a true picture of the life and appearance of an important frontier trading center and the significant events that occurred there. This will not only include the building, but the horse-drawn street cars, wagons, carriages, and stage coaches which will again rumble down the historic streets to the edification and delight of visitors."¹⁷

The urban riverfront should create a sense of place and continuity. A good design should strengthen the city dwellers' and visitors' sense of place and continuity by including elements for orientation which indicate to a person just where on the river-

front he or she is. This may be obtained by an obvious grouping of activities, identification with strong architectural elements, and access ways.

Elements which sever the continuity should be treated, also. By means of providing access over, under, around, or through these elements, continuity will not be destroyed.

The sum total of esthetic goals should reflect the riverfront as part of the city and relative in terms of the city as a whole.

C. Use of the Riverfront for:

1. Residential Development. The urban riverfront offers unlimited developmental opportunities both from an architectural point of view and from a resource point of view.

There is, admittedly, no absolute necessity for housing to be on the waterfront; it does not need access to the water in the sense that a waterfront site, along with the convenience of a central location in a city, can attract high quality residential development. New apartment towers are frequently built in large cities, where, from private balconies, nearly every apartment has a view of the water. Such high quality developments will attract high income occupants.¹⁸

Depending upon the city's policy on residential building in the city core, space may be set aside when land is cleared for redevelopment. Developers should then be offered attractive locations in order to encourage construction.

A city can choose the type of residential development it

wants in a renewal area. Since riverfront land would be such a high premium, medium or high rent apartments may be necessary. The type of structure must also be chosen on the basis of the availability of land. High rise structures, for instance, will adapt to conditions where the required open space ratio is high. Low rise and medium rise structures must also be incorporated with high rise in order to reach a balance between structural mass and efforts to preserve open space.

The spatial arrangement of residential structures is paramount to achieving as much visual and physical access to the riverscape as possible. This means that, in a residential complex, buildings should be arranged to give a view of the water to the maximum number of units. The view can be a positive financial asset, since apartments with a view, rent for more than those without.

Natural variations in elevation may also be used to create interesting views of the waterfront or a specific waterfront activity.

The clustering of structures, whether high rise, or low rise, will allow for additional open space. Preservation of open space will permit continual visual access from points within the site and further inland, or up and down the shoreline.

Waterfront subdivisions attract families who own boats or who are attracted to water-borne activities and sports. The type of housing units most suited in this situation would be townhouse condominiums, since more units are able to share in a given amount of space.

Net density requirements for townhouses range between six and twelve units per acre. The Urban Land Institute recommends that the number in one row be limited to five to eight units, thereby eliminating possible monotony.¹⁹ Siting of the clustered units for visual access may be achieved by stepping down or side slipping the structures where the terrain will allow this treatment. The interior-exterior architectural relationships should then carry out the site planning efforts by orienting the proper living space and fenestration to the water.

Where permissible, 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 e.g., weekends and holidays. Complete services to the boat slips, such as electricity, water, and dewage, 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.

If a marina is to be practical, and can be built in conjunction with a residential area, its feasibility will be judged by the type of construction, methods of operation, the climatic conditions of the area, the type of water body, and the clientele which would utilize the marina.

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 additional land fill required to bring building sites above seasonal high stream flow and/or a high water table. A site which has a high, ground water table is undesirable for homes with basements. Other factors which complicate a development of this type are the various governmental agencies regulating public water and shoreline rights.

Vacant sand and gravel pits are now recognized as possible waterfront residential sites. Sand dredging sites are most often situated on or adjacent to the riverfront. This close proximity to the river may enable the planner to provide direct access to the river for boating purposes. The small lakes or bays that are formed by the gravel operation can be developed as small marinas in order to accommodate the home owners' watercraft.

The National Sand and Gravel Association has published material giving specific guidelines to this type of development. The most recent research suggests a simultaneous dredging and reclamation process whereby the site is completely pre-planned for a future land use such as a residential development. As the sand is removed from the site, the overburden and unsaleable material is replaced to form building sites.

2. Commercial Development. Historically, most cities, whose early commercial centers fronted on the river, now find themselves growing away from the river. 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. Com-

- patibility of these undesirable uses depends upon their visual qualities and whether or not they produced air or water pollutants.

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. The major benefits derived would be the esthetic appeal that the water provides and the numerous activities connected with the water. Riverfront stores and shops also have the ability to take on new images by creating interesting store fronts, which express the historical architecture e.g., the San Antonio, Texas Paseo del Rio.

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 unobstructive view can be maintained. The aerial view from the offices would make a pleasant contrast with the concrete and brick urbancape.

3. Industrial Use. Today, the type of industry dependent upon the river for transporting raw material and manufactured

- goods is declining. 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. In some cases, industrial plants have been forced to close.

Industrial development within the urban area should be limited to light industry and should exclude those which give off odors or smoke. Often, as the case may be, central urban areas are undesirable for industrial development of any type due to the lack of land for expansion.

Light industry including warehousing and trucking operations are more compatible, since there is less chance of them 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.

Industrial sites needing access to the riverfront for navigation must have the following characteristics:

- (a) The site must be close to deep-draft navigation.
- (b) The site must be above the level of floods.
- (c) The industrial sites must be relatively level.
- (d) The soils must be stable and capable of bearing heavy loads.
- (e) The site should have ready access to both rail and highway traffic.
- (f) The site should have access to high voltage power.
- (g) The shape of the sites should be such that barges may be docked parallel to the shore.

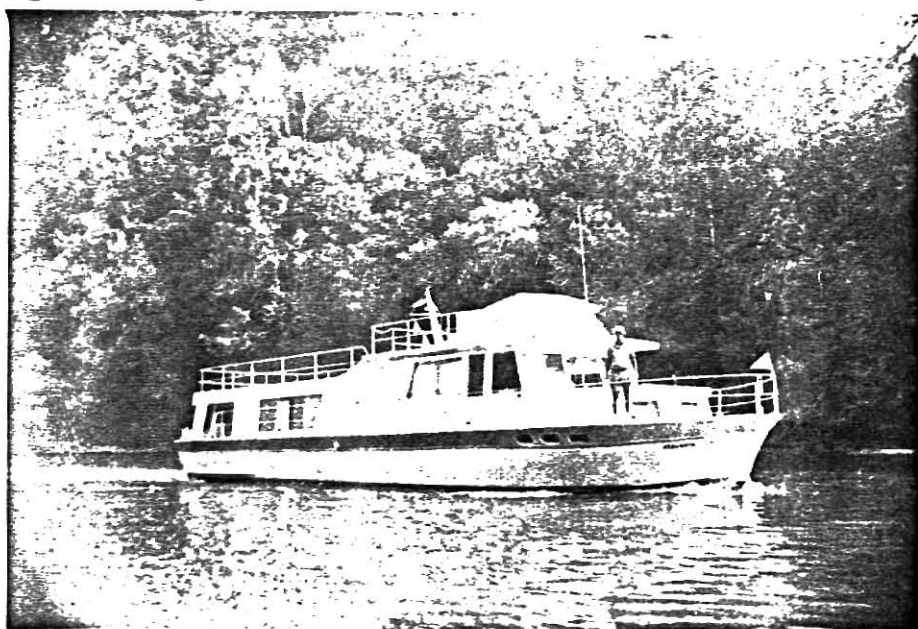


Fig. 11

Large river cruiser on Kentucky River, Frankfort, Ky.



Fig. 12

Water ski boat on Little Arkansas River, Wichita, Kan.

(h) The total industrial park should be large enough to allow for future expansion needs.

Any industry utilizing raw water must have the capabilities for cooling and cleaning the water to such a degree that it is as clean or cleaner than its original condition. Industries whose raw materials or processing cause dust and smoke must be required to have devices and/or procedures by which the dust and smoke are kept from entering the air.

4. Recreation Use. Planning for the use of the urban river-front for recreation starts with the water-borne uses such as boating, water skiing, swimming, and fishing. These uses depend upon adequate water, shoreline, adjacent land, and, perhaps the most important, water quality.

In order that each water activity may be successful, various zones of activity may be established which are based upon the spatial needs, boat speeds, and shoreline requirements.

The largest redundant space demanding activity is boating. It is a complicated activity which employs many different types of vessels and patterns of movement with a variety of spatial needs.

Boating demand is consumptive of shore space, and water space consumption on water surface is directly proportional to speed. Consequently, consumption of the water space is much higher for fast boats and for random travel, such as is done when water skiing. 20

The Army Corps of Engineers uses a "design load" concept

in setting its boating standards which are continually modified in accordance with changing conditions. The design load is defined as the maximum number of people expected to use an area at any one time on a normal weekend day for which facilities would have to be provided.²¹

Depending upon the width and length of navigable water, the type of vessel allowed on the water must be considered as a planning factor. Narrow streams 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. Large streams with unlimited navigation are best suited for a broad range of water-borne recreation activities.

Space demands for boating upon a river are somewhat different than those for lakes. Boating activities must be planned in a linear fashion due to the physical limitations of the stream width. If the boat traffic has to pass through certain use areas, such as a water ski area, controls may become complicated. In order that confusion and intrusion is kept to a minimum, speed regulations and buoyed markers can contribute towards defining and controlling water spaces.

In Frankfort, Kentucky the State Department of Public Safety maintains patrols on the Kentucky River to enforce water speed zones. Within the various stretches of the urban riverfront, "no wake zones" are designated. These areas are found along public boat docks, ~~marinas~~, and launching ramps. The watercraft must not cause wave action. Other areas designated by a "slow speed"



Fig. 13

Ski boat pulling skier on Kentucky River, Frankfort, Ky.

sign 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.

It was evident from these observations that use zones could be controlled by the use of speed regulations and channel markers to define the zones.

The most popular activity is water skiing. Due to the nature of the sport, water skiing should be planned for special zones along the river. This is necessary for the skiers welfare, and it permits the balance of the water area to be planned for other uses. In choosing a water ski area, there are several factors which warrant consideration. These are:

- (a) 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.
- (b) The water should be free of partially submerged objects such as trees, anchor cables, old bridge supports, water intake pipes.
- (c) The water skiing area should also have inland access for cars and parking. This will allow visitors in the area to view the sport plus giving access to skiers arriving by automobile.
- (d) Due to the element of risk involved in water skiing, a shoreline ski shelter and dock should be considered. The shelter could provide protection from the elements plus containing emergency equipment.

- (e) To determine the amount of water space needed, the planner will have to make sample surveys of existing ski activity within the area. The average number of boats can then be applied to a space standard which is expressed as one boat per acre of water.

Water skiing and swimming are most readily endangered by water pollution. Before consideration of any planning factor, the river water must be of a quality suited for body contact.

Swimming beaches are more easily accommodated where there is an abundance of natural sand and suitable inland access. Natural sand bars are usually found on the inside curve of a sharp river bend. The current is slowest at such a place and the sand particles carried by the stream are deposited. Sand bars may also be found where smaller streams and drainage ways empty into the river. From this author's observations, these areas are usually too small for development.

Vacated, sand, dredging sites make the most ideal swimming areas. If the site is not directly open to the river, but is adjacent to it, (such as a dredge pond), it may even be better for several reasons:

- (a) The site may be less subject to the water fluctuations of the river;
- (b) The ground water seepage from the river will be cleaner due to the filtering action of the sand;
- (c) The captive pool may be chemically treated and aerated to lower the bacteria count if necessary.

The only apparent drawback which could limit the use of dredge ponds would be their interim use for land fill or inland uses which could pollute the ground water.

Care should also be taken not to choose a site that is near industrial or commercial areas. Access through these areas in order to get to the swimming beach would be less desirable insofar as activities are concerned than access through a residential area.

General space requirements for swimming beaches are listed in the following table.

REFERENCE	FACILITY	STANDARD
Soil Conservation Service, Recreation Memorandum-3, p.3	beach	100 to 200 sq. ft. of swimmable water per swimmer. 50 to 100 sq. ft. of beach per swimmer
National Recreation and Park Assn. Bulletin No. 51. p. 6-8	beach	Most of the time there are more persons on the beach sunning than in the water. Since the amount of usable water space per person ranges from 50 to 100 sq. ft., the available site will determine the capacity of a particular bathing beach
BOR, Water-Oriented Outdoor Recreation Lake Erie Basin p. D-9	beach	75 sq. ft. of beach per person
The Comprehensive Outdoor Recreation Plan for New Jersey p.9	Swimming and boating areas	1.25 acres for each 1000 population
Cache Creek Basin Recreation Study (Millbrae, Calif.) 1958. p. 11	beach	100 feet beach frontage per 100 persons

Fig. 14

(d) Legal Controls

Various cities throughout the United States, confronted with urban riverfront redevelopment, have devised legal controls which are focused on the special problems associated with riverfront land. One such example is the city of Richmond, Virginia whose urban area fronts upon the James River. Included in their recommended Riverfront Standards and Controls were the following items:

1. Land Use Controls
2. Building Height and Bulk
3. Building Location
4. Bridges and Viaducts
5. Structures Within the River
6. Regulation of Water Flow
7. Preservation of Natural Features
8. Pedestrian Walkways
9. Treatment of Riveredge
10. Limitations on River Recreational Use
11. Pollution and Litter

A copy of the complete draft is included in Appendix C.

Zoning laws, subdivision regulations, and building codes are the means by which a city may exercise the police powers to insure the orderly development of urban land. Urban riverfront redevelopment will require special regulations to control special problem areas. The following is a summary of riverfront related items which will require regulatory controls:

1. Flooding. In areas where flooding is a frequent hazard,



Fig. 15

Erosion control using broken concrete and brick for
Arkansas River, Wichita, Kansas.

the city should develop flood plain zoning to cover such problems as drainage and location of permanent structures within the flood zone. Depending upon the degree and frequency of flooding, undeveloped land may be zoned such that no development would be permitted. Areas such as these may be considered for recreational use since there would not be any habitable structures involved.

Flood plain zoning should be comprehensive. In order that a city insures its own protection; flood plain zoning should extend outside of the city limits, which would require the initiation of county and state zoning laws. Flood plain zoning at the county and state level requires close coordination to insure that there are no conflicts or overlapping zoning regulations.

2. Access. In order that a city discourages complete monopolization of the river shoreline by private ownership, it may choose to zone for public access space at various intervals along the river. This may be carried out by requiring minimum set back of structures and dedication of access space to and along the shoreline for public use.

3. Shoreline Treatment. Control of unsightly shoreline structures, and erosion control measures will help to curtail the visual pollution along the riverfront. The city should have the authority to require land owners to build and maintain any type of erosion control structures, steps, walks, or docks to minimum specifications in order that these structures do not become unsightly.

One of the worst visual problems along the urban riverfront

has been the use of broken concrete and old auto bodies for erosion control. The result has often been a weed and rodent infested embankment which is both unsightly and a public health nuisance.

4. Surface Water. The tremendous increase in recreational use of the river has created conflicts between the users of the surface water. This conflict includes the volume of use as well as the different types of vessels using the water. The result has been a need to create order on the water surface to assure the greatest use and benefit to all.

Land use may also affect water uses. If land uses pollute or disturb the water, fishing or recreational boating may be discouraged. Preliminary consideration in surface water regulation should be given to avoid conflicts caused by land use arrangement.

In most, if not all states, the public has rights to free and unobstructed recreational use of navigable waters. These rights can be subject to reasonable regulations. One of the most common and workable regulations is the establishment of speed zones around certain slow moving activities. These speed zones may be created around marinas, launch facilities and swimming areas.

An alternative to the separation of fast and slow boating is the simple restriction of a particular use. Water skiing, for example, may be designated for a certain portion of the river in such a manner that the activity will not conflict with other uses. Other restrictions may include forbidding water skiing activities

during early morning hours and late afternoon hours.

The major goals of speed or horsepower regulations are to attain safety. In all cases, regulations should be designed to require boating to be carried out in a careful and prudent manner at a reasonable distance from persons and property.

One of the rising problems which relates to surface water zoning deals with non-navigational residential or commercial uses. This includes floating homes, houseboats and restaurants. Floating homes and house boats demand special consideration because they may dump untreated or partially treated sewage into the water. Persons occupying floating homes and houseboats can also establish temporary residence in a community without contributing any taxes.

In Frankfort, Kentucky this author counted five floating homes. Three had been abandoned due to decaying floatation. These structures are eyesores along the shoreline. This is but one example which illustrates the need for municipal zoning regulations covering the water surface.

5. Bulk and View Zones. In order that open space and visual aspects of the riverfront are maintained, zoning may be enacted to control the bulk, height, and spacing of buildings. Waterfront views are especially important to property values, and view regulations would be helpful to the goal of protecting or increasing those ~~property~~ values.

6. Architecture and Esthetics. The architecture and exterior appearance of buildings along the riverfront may also be

subject to control. The primary objective of this form of regulation would be to prevent discordant architecture. This may apply to developments adjacent to riverfront zones which have historical significance or scenic value.

There are two forms of control standards which may be combined in the same ordinance. The first is a "look-alike" ordinance which would promote basic similarity of building style. This can apply to certain riverfront areas, where, by custom, most structures utilize similar building materials, colors, and architectural motifs. The second form is an "anti-look-alike" ordinance designed to avoid extreme similarity in style. The definition of when a building is too similar or dis-similar in architectural treatment would have to be administered by an architectural review board made up of experts in architecture.

Esthetic controls do not need to be limited to coercive measures. Often, the municipality can improve the appearance of the riverfront by formulating a design theme through the use of "conceptual sketches". This was the approach taken by the city of San Antonio, Texas for its Paseo del Rio. (See Appendix B) Once a complete sketch plan is prepared, property owners can then be encouraged to cooperate in making improvements along the guidelines as prepared by the city.

7. Riparian Rights. The various legal rules and doctrines regulating waterfront property rights can complicate urban riverfront redevelopment. Property description problems often arise, when land is bounded by water, due to the inconsistency of the

- river's edge, such as meander shore line, brought about by high and low water.

In terms of a redevelopment project, the planner must consider the physical extent of a property or properties in terms of the following:

- (a) Ownership of land adjacent to water may include a portion of the stream bed.
- (b) The ownership may extend to the high water elevation, to the low water elevation, or to some arbitrary distance beyond the high water elevation.
- (c) If ownership extends to one of the various water elevations, it may prove difficult to locate the mark.
- (d) Ownership of submerged lands.
- (e) Public rights in navigable waters.

In general, the substance of riparian rights includes the right of access to the water; the right to accessions which have or may attach to the land; the right to natural flow of the water past the land; and the right to make reasonable use of the water.

E. Achieving Optimum Riverfront Use

The redevelopment of any urban riverfront will mean the combined cooperation of both private land owners and the city to realize the full potential of the riverfront.

Initially, a city may choose to discourage any new development which may pollute the stream or possibly be incompatible with future developments. A guiding transition for private in-

vestors and riparian owners would be helpful in order that overzealous developments do not take place prematurely. This may be carried out by educating the public and the riverfront land owners about the impending land use and redevelopment plan. In the beginning, it is an important step to marshal public support especially, if at a later time, the community desires to take drastic action against non-cooperative riparian owners.

Once the redevelopment plan and land use are approved the city can then take action to enforce new codes and regulations against conditions which run counter to reasonable public use and enjoyment of the water. The first effort should be aimed at cleaning up the water and poorly maintained riverfront land.

After these efforts are made, the next steps involve significant public financial involvement. In order that a complete redevelopment plan is carried out, the local government may find themselves spending large sums of money and being committed to long term programs. Federal assistance for redevelopment of this nature is made available through the federal office of the Department of Housing and Urban Development. Federal matching funds will help the community to stretch its investment dollar. Urban riverfront areas designated for recreational use may receive assistance through the Federal Bureau of Outdoor Recreation which grants matching funds for land acquisition and development.

The initial land acquisition programs may include public acquisition of a narrow shoreline zone. This would be costly initially and would put the burden of maintenance upon the city,

but in the long run would give the public much greater control over the use of the riverfront. This could be the single most effective tool for reversing the focus of riverfront disuse, decline, and decay.

Other land acquisition efforts may involve acquisition and clearance of blighted areas, then disposing of the land for redevelopment in accordance with planned uses. Before the land is resold for private development, certain physical improvements may be necessary. This could include reworking storm and sanitary sewers especially if they are found to be contributing to the water pollution problem.

Selective clearance, through condemnation, may be necessary to remove structures which physically or psychologically stand in the way of development. This action can lead to numerous legal questions especially if the public desires to condemn structures which do not appear to be physically deteriorated. Some decadent structures may be desirable to save and rehabilitate. Structures which are flavorful, interesting, or of historical significances may be valuable resources to the riverfront scenery.

The final physical development of the riverfront should reflect the coordination and combined efforts of city government and private developers such that a total harmonious balance between the urban environment and the natural environment are reached.



Fig. 16

View of Frankfort, Kentucky urban riverfront.

V. Riverfront Redevelopment on the Kentucky River:
A Case Study of Frankfort, Kentucky

A. The Study Area

1. History. Frankfort, Kentucky, Capital of the Commonwealth of Kentucky, is located in the north central part of the state. This area, more commonly referred to as the "Blue Grass Region" is famous for its purebred race horses and horse farms.

Frankfort was officially founded by a revolutionary war hero, General James A. Wilkinson, in the year 1786. Wilkinson chose this location along the Kentucky River primarily to take advantage of the river for commerce between north central Kentucky and New Orleans, Louisiana.

Wilkinson was responsible for laying out the street plans in the classic gridiron pattern, a pattern which hardly lends itself to the bend of the river or the steep hills on all sides.

River commerce was important to the early development of Frankfort, but it was not until 1836 that the large steam-driven paddle boats were able to navigate to Frankfort year around. By 1836 a series of five locks and dams had been built, Frankfort being located at lock number four. These improvements enabled river commerce to increase making Frankfort a major riverport to all of north central Kentucky. The Kentucky River was the first river in America to be provided with locks and dams, making a six foot stage at Frankfort for all seasons.²²

As steamboats became a familiar sight along the Kentucky River, people were soon to choose their favorites. One of the most



Fig. 17

View of Dreyer-Whitehead and Goldecke Sand Company
with sand barges.

popular boats was "The Blue Wing" supposedly the last word in elegant steam boats. The register of the Kentucky Historical Society said that whenever the boat stopped, people would come aboard to admire the beautiful carpets and mirrors.²³

Keeping the Kentucky River open and navigable year round was of such great importance that laws were enacted by the early legislatures to fine persons who blocked navigable streams with mill and fish dams. Not only did the state laws make the river channels public property, but provisions were made to "warn out" every able bodied man of taxable age living within five miles of navigable river to help improve their channels.²⁴

Life along the Kentucky River has also meant living with the possibility of flooding. In Frankfort's recorded history, there have been two major floods. The first occurring in 1883 and the most recent of similar magnitude happened in 1937. Both floods were responsible for inundating much of Frankfort's central urban area.

2. Frankfort Today. Very little commercial river traffic exists on the Kentucky River today. The exports from Frankfort, which once made it a major river port, are no longer in existence. The only local business which relies on the river for raw materials is the Dreyer-Whitehead and Goldecke Sand Company. Ohio River sand is brought by barge and paddle wheel tug to their loading dock opposite Wilkinson Street just north of the Capital Plaza. Here it is unloaded and stockpiled for resale.

Private pleasure craft are the most common sites on the river today. From small 14 foot run-abouts to the 45 foot house-

Marinas and boat docks exist now where there once were wharfs for loading of river freight. Homes have replaced the sites of riverfront distilleries, lumber mills, factories, and warehouses. Of the 100% of incorporated riverfront land today 46% is private property and 5% is public use.

Although riverfront land use has changed sufficiently in the last five decades the greater portion of incorporated riverfront land is private property, leaving only a very small percent of public land with access to the water's edge. The following table indicates the breakdown of incorporated riverfront land.

Land Use	Percent of land fronting on river	Percent of land with water access
Residential	46%	10%
Commercial	10%	0
Industrial	7%	50%
Public-Recreation & Open Space	5%	40%
Public Institutional	5%	
Other - Unusable	27%	

Fig. 18

As the Capital of the Commonwealth of Kentucky, Frankfort's economy is supported primarily by the approximately 13,000 state employees. The balance of Frankfort's economic base is made up of the bourbon whisky and manufacturing industries, construction, agriculture and retail trades and services.

B. Design Analysis Procedure

1. Definition of Study Area. The criteria used for defining the study area was based on a number of existing conditions along the extent of the urban riverfront. Initial definitions were established by barriers such as boundaries, streets and difficult topography. Secondary definitions resulted from visual studies to determine the existence of blight and its extent, and non-conforming or incompatible uses which were determined from the latest land use proposals.

The third criteria was adjacent undeveloped riverfront land which had potential for development in conjunction with the study.

The fourth criteria was based upon existing and proposed construction of new streets and urban renewal areas.

2. Inventory and Identification of Environmental Resources Within Study Area.

(a) Natural Resources: All natural resources existing within the study area were mapped according to their broad categories such as water, land, vegetative and animal resources. Intrinsic resources within the general areas were also noted.

(b) Man-made Resources: The mapping of man-made resour-

ces consisted of identifying all man-made structures or areas of esthetic, historical, or functional use in conjunction with the river and the community.

3. Resource Analysis. Once the sum total of all possible resources were established, they were studied on the basis of the following relationships:

(a) The natural resources and environment and its effect on the urban area;

(b) The man-made resources and environment and its effect on the natural stream environment;

(c) The best possible balance between use and conservation of both resource types.

4. Range of Land Uses is Determined and Physical Limitations for Each are Identified. The range of land and water uses were determined by their relative compatibility with the natural river environment and the benefits which could be realized without affecting or changing any of the natural features.

The major limitations affecting each use area were soils, topography, and hydrology. Water uses were limited primarily by the type of activity and its effect upon shore line structures and adjacent land use.

5. Criteria Established for Development of Land Use Area from Survey of Community Needs and Past Studies with Similar Conditions. This phase of the analysis was determined from a combination of personal interviews, visual analysis and study of past reports. Although the various reports

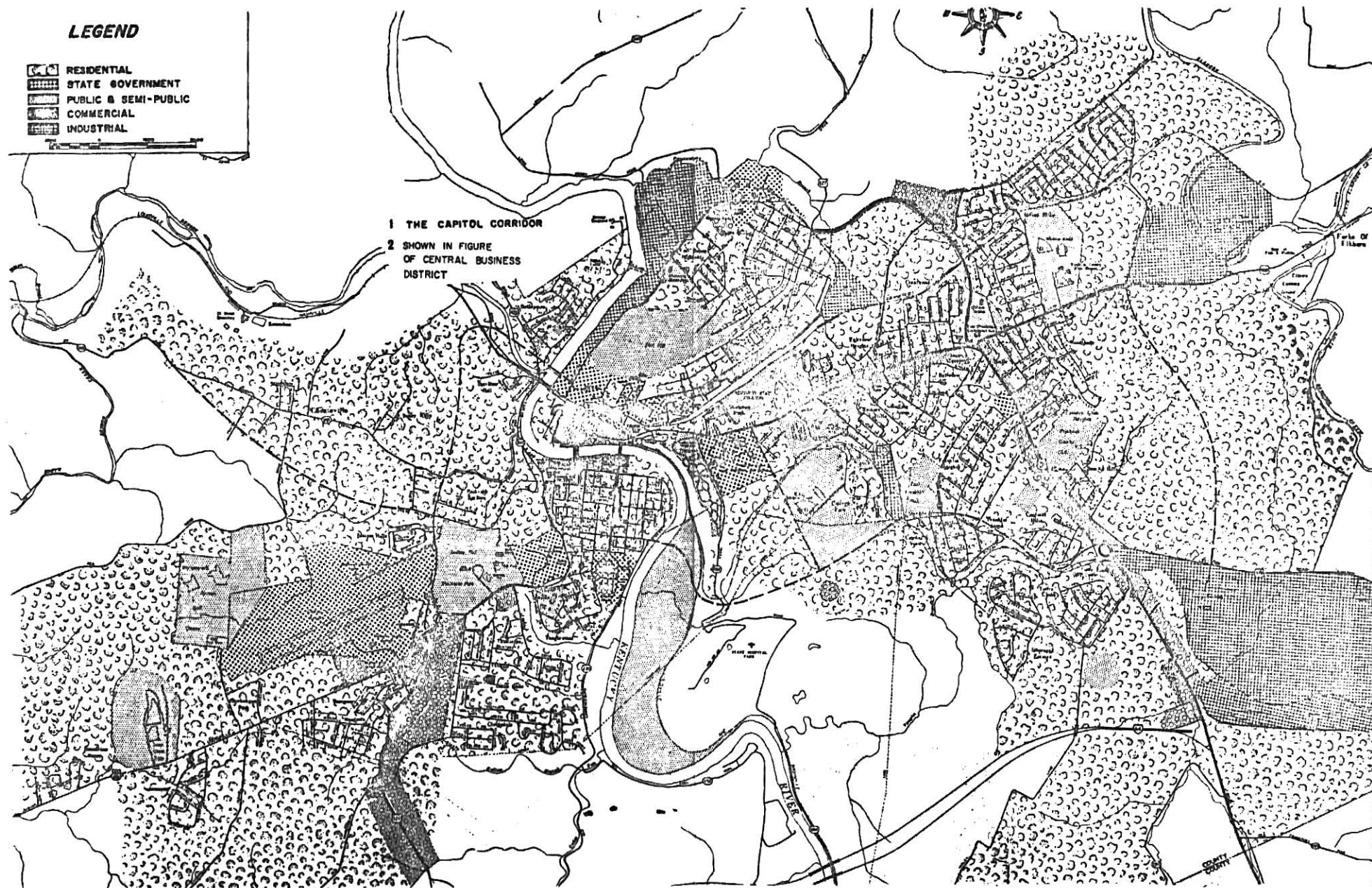


Fig. 19

Area map of Frankfort, Kentucky, site of riverfront study area.

varied from planning period to planning period there were broad objectives which were sustained in each study. These were drawn out and used as guidelines for community development need. Not all of the information was used. There were statements and proposals in each report which this author chose to disagree with due to the fact that they ignored certain environmental limitations which were brought out in this study.

C. Proposed Urban Riverfront Redevelopment
Plan for Frankfort, Kentucky.

1. The Study Area. Frankfort's urban riverfront extends south along both sides of the Kentucky River from a point below the U.S. Army Corps of Engineers Lock and Dam No. 4 to a point above the state capital grounds. Additional riverfront lands were included outside of the urban area because they are expected to be developed in the near future and taken into the incorporated limits of the city. This additional riverfront land is identified as the Old Kentucky State Hospital Farm.

The total riverfront study area was divided into sub-environs defined by a major street or streets. This division of the total study area was primarily for reference purposes and does not imply that there existed any unique qualities within any one area.

(a) Existing Land Use and Physical Conditions: Area number one lies west of lock and dam number four and is bounded on the north by the municipal sewage treatment plant, on the south by the Bellpoint subdivision and on the west by a steep hillside and woodlands.

The open land slopes gently to the east towards the river,

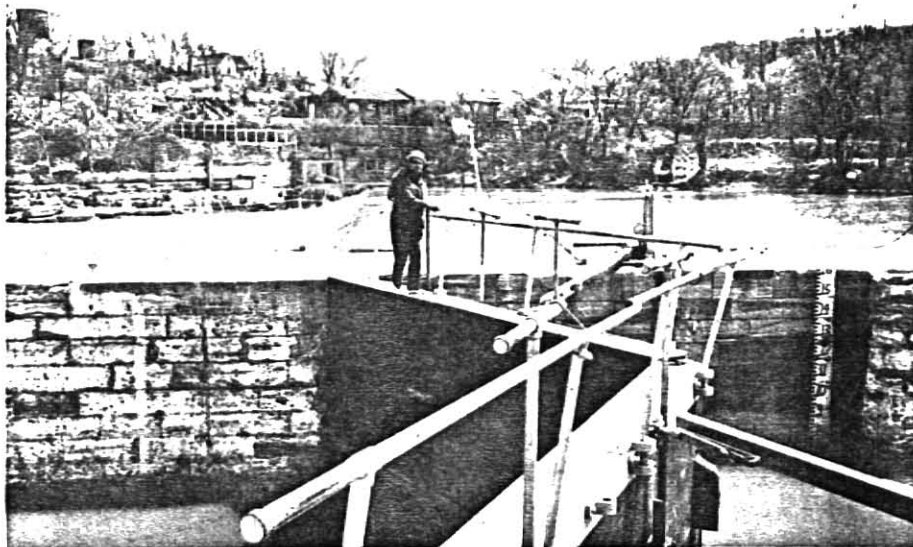


Fig. 20
View of lock #4 operated by U.S.A. Corps of Engineers.



Fig. 21
View of riverfront along Bellpoint subdivision.

the majority of which is in agricultural use. Adjacent to the lock and dam are the two-story wood, frame residences of the lock master and assistant lock master. To the west of the residences are four garage buildings now being used by the city of Frankfort for storing city maintenance vehicles. The physical condition of these structures is such that they will soon be cleared and the maintenance area will be moved north to the sewage treatment plant area.

Public access to the locks and dams for the public is provided by the Corps of Engineers. Pedestrians are allowed to walk down to the locks where they can get a first hand view of the historic structure in operation.

There are no other public facilities provided other than a few parking spaces. Much of the public use of this area has been access to the water's edge for fishing.

There are three private wood-frame residences located to the south of the locks along Kentucky Avenue which provides access to this area. These small residences are generally well kept but are showing their age-typical of the major portion of homes in the Bellpoint area.

Area number two takes in the major portion of the Bellpoint subdivision. Bellpoint is one of the older subdivisions in Frankfort and is characterized by small wood, frame houses on very narrow lots and inadequate in terms of most present day residential subdivision regulations.

The eastern portion of Bellpoint has been subject to flood-

ing, the last of which occurred in 1937. This, plus the age of the structures, may be the contributing factor to the scattered blight now present in the neighborhood.

Structures which have been allowed to be built between Kentucky Avenue and the river are in the greatest danger at present. The seasonal stream fluctuations and the unstable soils have caused sections of the river embankment to slide, thus endangering the foundations of these structures.

Commercial land use in the Bellpoint area is localized along the southern boundary between Bald Knob Road (Kentucky 421) and Benson Avenue. The businesses for the most part are small neighborhood shops consisting of two small grocery stores, a laundry and several repair shops. The business taking up the greater amount of space is a mobile home sales fronting on Bald Knob Road.

The general appearance of the commercial area makes it uninviting and carries with it the stigma of blight. The only commercial riverfront facility is a small marina located at the intersection of Major Street and Kentucky Avenue. The only essential services that are provided include a limited amount of dock space, fuel supplies, and fishing bait.

Area three is a strip of land that lies between Kentucky 421 and Benson Creek. The land is now owned by the city of Frankfort and is now being used as a sanitary land fill, earth borrow area and site of the city municipal incinerator.

The borrow obtained from this site was used for the construction of the Army Corps of Engineers Dike opposite the

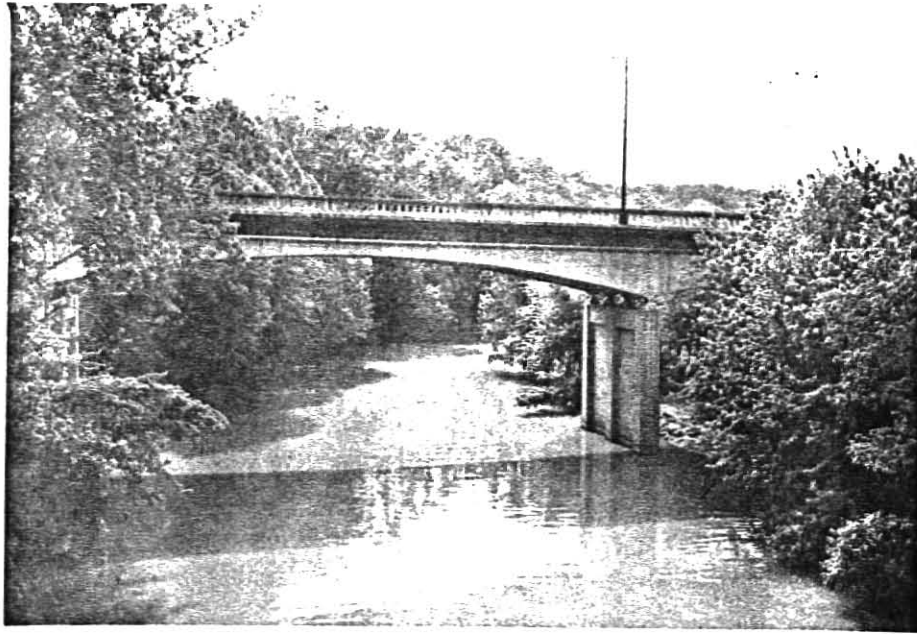


Fig. 22

View of Benson Creek which divides areas 3 and 4.

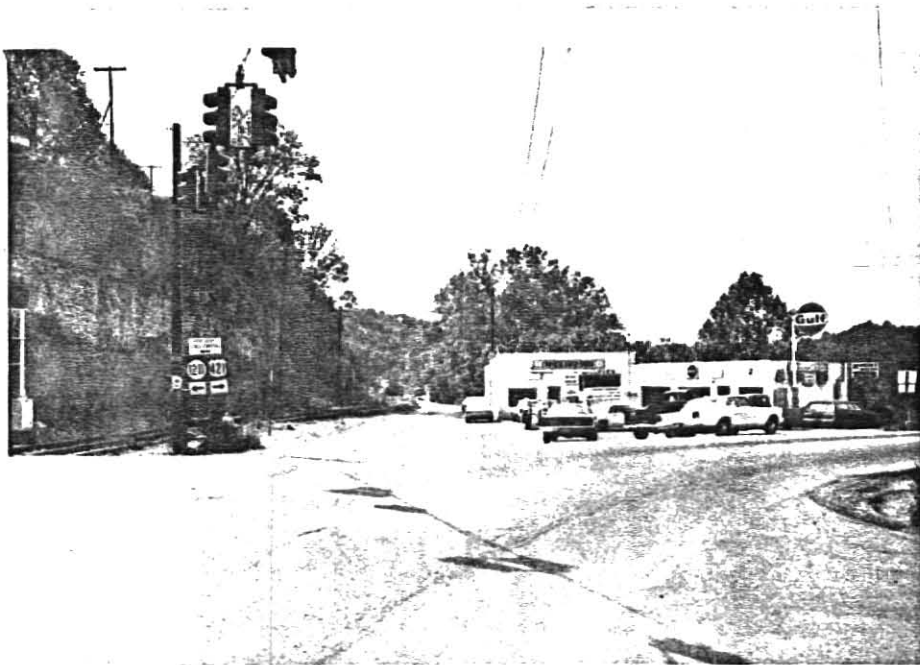


Fig. 23

Capital Office Plaza. The result of this borrow has left the site virtually useless since it now floods very easily. Efforts by the city to lease the land for farming have been fruitless due to this very problem.

Benson Creek itself is the only major tributary to the Kentucky River in the Frankfort area. Though not pollution free it is a major attraction to fishermen because of its accessibility from the Kentucky River. Personal inspection of the streams by boat indicates that the stream would be most adaptable for canoeing and other small watercraft. The stream corridor generally very scenic, does, however, have a few areas along the stream bank where trash dumps have been created. Barring these few eye sores, the stream corridor still contains some of the most interesting scenery in the Frankfort area.

Area number four to the south of Benson Creek contains a mixture of agriculture, industry, mining and a few small residences. The area is defined on the south by steep wooded hillsides and on the west by a small natural drainage way emptying into Benson Creek.

Bisecting the area longitudinally is the Benson Valley Road which terminates at the 21 Brands Distillery, one mile above the site, and a set of railroad tracks owned by the L&N Railroad Company. Benson Valley Road is the only vehicular access means to this area and is used heavily by large trucks hauling gravel which is mined from a pit in the southwest portion of the site.

The few small dwellings in this area are located along

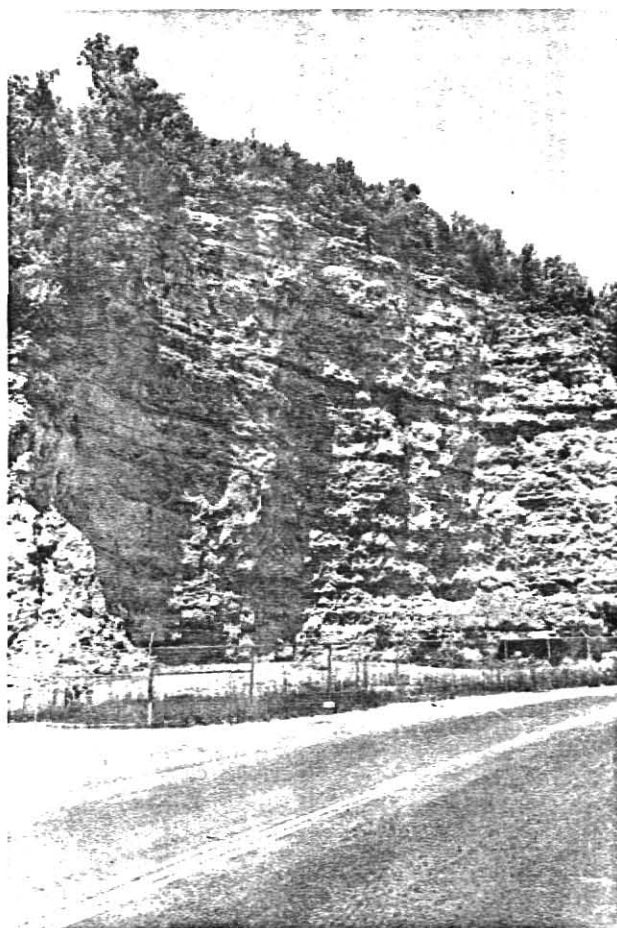


Fig. 24

View of stone quarry on Taylor Avenue.

Benson Valley Road about one-half mile from the intersection of Benson Valley Road and Taylor Avenue. These structures are served by city water but not by city sewer. The condition of the homes may be described as being heavily blighted and in a few cases unfit for habitation. The heavy truck traffic and periodic train traffic along the road adds to the undesirability of the site for any form of residential use. Since this area is not within the corporate limits of the city, it cannot be regulated by the city building codes.

There are future plans for a four-lane roadway which will divide the area and eliminate the crushed stone operation. This roadway will connect the extension of Parkside Drive and Clinton Streets providing a new access to and from the Capital Plaza project of Wilkinson. This construction will provide ample opportunity to redevelop the land for a more suitable purpose by filling the lower floodable elevations in conjunction with the earth moving process of road construction.

Area number five consists of a strip of riverfront land extending south from the bridges at the intersection of Taylor Avenue and Benson Valley Road, to the intersection of Devils Hollow Road and Taylor Avenue.

The greater portion of Taylor Avenue is flanked by the steep wooded hillside on the west and the wooded riverbank to the east. At the south end of area five on the west side of Taylor Avenue is an old stone quarry (see photo opposite page). The mining operation has left a sheer rock cliff exposed with a ser-

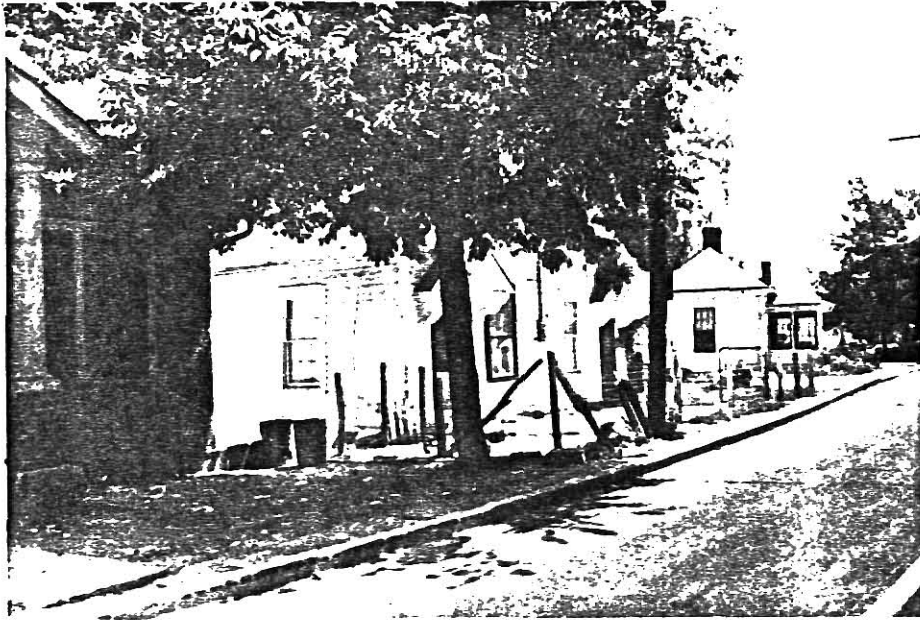


Fig. 25

View of blighted homes along Taylor Avenue in area 6.

ies of tunnels at the base. The tunnels formed by the mining process are 15-20 feet wide, 12-15 feet in height and penetrate the hillside as far as one-half mile. The air temperature in the tunnels is a constant 70 degrees.²⁵

The only use of the tunnels, since the mining, has been the storage of civil defense supplies. The tunnels would be used as a shelter in case of an atomic attack.

The general appearance of the area at first glance is quite interesting since the bare cliff exposes some interesting geology. The balance of "yard area" in front of the cliffs provides a cleared area of 1-1/2 - 2 acres of usable land. To this date, there has not been any concrete effort to reclaim this area for a suitable use since it lies just outside of the city limits.

Area number six extends along Taylor Avenue from Devils Hollow Road to Second Street, then along Second Street east to Bridge Street. The land use along Taylor Avenue to Second Street is primarily single family residential.

The homes flanking both sides of the street are a mixture of one and two story wood, frame structures. The major portion of the homes are built very close to the street due to the limited buildable area on both sides of the road. Since off-street parking is only available to a few of these homes the access on Taylor Avenue is limited during heavy traffic periods. Blight is also taking its toll along this street. The several empty and decaying structures present a bad image to the few homes which have been maintained well.



Fig. 26

View of Second Street business district.

At the intersection of Taylor Avenue and Second Street are several small businesses. These commercial uses are non-conforming and therefore lack improvement which adds to the general picture of decay.

The Second Street School provides for the only recreation facilities in the south Frankfort area. Due to the limited amount of open space around the school, needed expansion of public recreation facilities is very limited. The existing public recreation facilities now available include a small ball diamond, a tennis court and a basketball court. Any future expansion of the school building will have to take a portion of these meager facilities.

At the east end of the school property along Bridge Street are three buildings which house a small cafe, a printing shop and the Y.M.C.A. The structural condition of these buildings is such that a sizable investment would be required to bring them up to municipal building codes.

Area number seven is formed by Second Street, the Kentucky River, Bridge Street and Capital Avenue. This three block area represents one of the major transitional areas along the central business district riverfront. The existing land use is a combination of commercial and single family residences. The significance of this central business district fringe area is the fact that it offers the greatest potential for commercial expansion due to the limited space in the central business district. Recognizing this factor, the city of Frankfort has recently zoned



Fig. 27

View of area 8.

the entire area for commercial use.

The physical condition of the commercial structures ranges from good to very poor. An interesting correlation between the condition of the structures and the availability of parking was that the structures with the least amount of available parking were in the poorest state of repair. Once the residential structures are removed, additional space will then be made available both for parking and redevelopment of the commercial establishments. According to a 1963 CBD Study, this area is not expected to reach its full potential until the full transition is made.

Area number eight is located east of Capital Avenue and north of Second Street to the river. The land use is primarily single family residential but the west half is mixed with warehouses and a few commercial buildings which front on Second Street between Logan and Capital Avenue and Battle Alley.

Most of the warehouses, have in the past, been utilized by the state of Kentucky for storage purposes but are now vacant. These structures are generally in poor condition and add to the blight and decay evident in most of the residences.

The nature and condition of homes in this area can be attributed to similar conditions existing in the Bellpoint subdivision, namely small narrow lots, small wood, frame homes and no minimum side yard. Many of the houses along Second Street have less than two feet separating adjacent buildings. This condition would not allow access for purposes of repairing too many of the homes. A few of the homes located adjacent to the

riverfront do enjoy the open space provided by the river corridor, but the intermittent trash dumps take away from the natural scenery. The transitional aspects of this neighborhood is somewhat typical of most residential areas where ethnic families replace homes vacated by the white middle class.

One of the most startling aspects of this neighborhood is the fact that there is no transition from the poorest homes north of Second Street to the \$40-\$50,000 class of homes existing along Paul Sawyer Drive which is the extension of Second Street. Most of these homes are new, having been built in the last ten years. The home owners along the riverfront have developed their own private docks and access to the water's edge. It was evident from personal observations that these home sites were chosen particularly due to the attractive riverfront scenery and access to the water.

Area number nine is the largest monogamous riverfront section in the Frankfort study area. This area of land lies west of Wilkinson Street to the river and extends from the Broadway Street Bridge north to the Stagg Distillery.

The existing land use is composed of single family residential, warehousing, light and heavy industries, and recreational. The recreational land use is composed of a 1500 foot section of riverfront land extending north from the Broadway Bridge to the municipal electric sub-station. This is the site of the recently completed Corps of Engineers Dike and Riverfront Park directly across from the Capital Office Plaza.

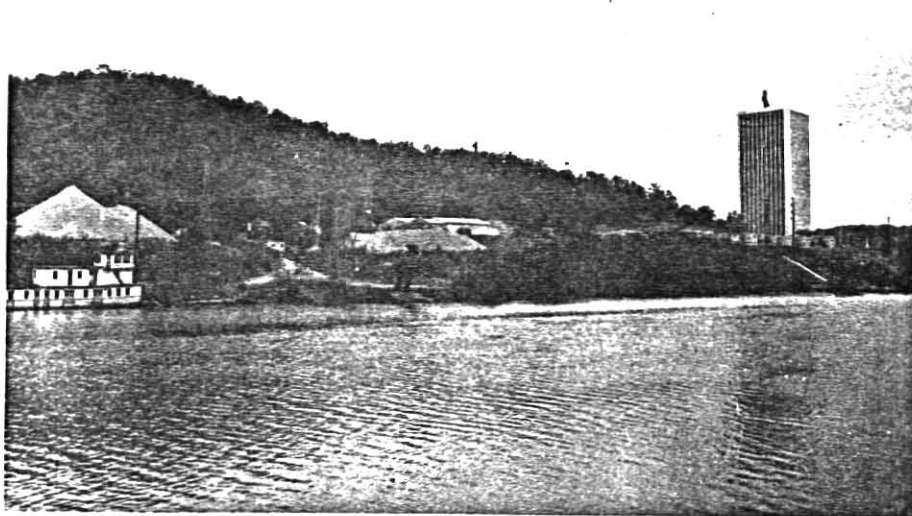


Fig. 28

View of industrial area north end of area 9.

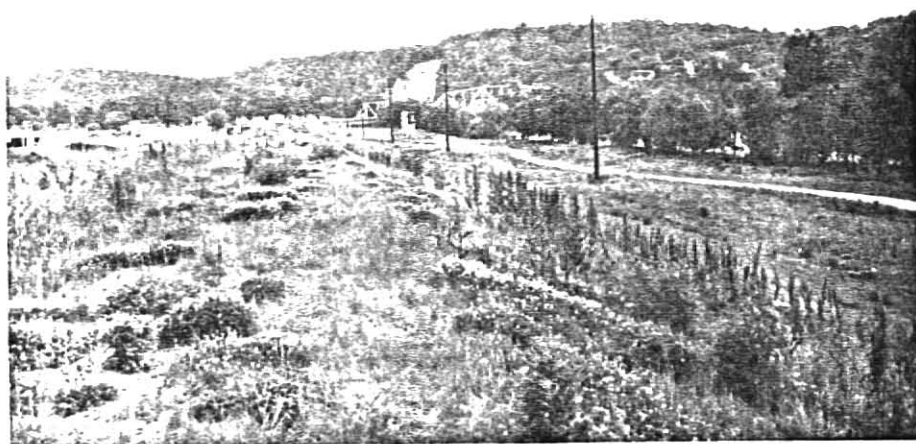


Fig. 29

View of Dike and proposed riverfront park to be constructed by U.S.A. Corps of Engineers.

North of the dike are a series of heavy industrial operations which include a concrete batching plant and trucking company, a sand plant, and a series of gasoline storage tanks. Between the gasoline storage tanks and the old state warehouses is a small pocket of six single family structures. Again, to the north of the warehouses is another residential area but it is somewhat larger.

This series of land uses is consistant with the greater percent of urban riverfront land uses in Frankfort, typically inconsistent and inharmonious in nature. Advantageous to this section of riverfront land is the urban renewal and reconstruction of Wilkinson Street in progress. Urban renewal has made possible the construction of new public housing along the east side of Wilkinson Street and at the same time clearing part of the blighted structures which front on that side of the street.

The inconsistency of the City's efforts in this behalf has been to allow the latest land use plan to sustain the heavy industrial use along the riverfront. The sand plant is the only operation which still makes use of the river and riverfront land to obtain its raw materials. The oil company, which once barged gas to the storage tanks, now trucks their gas to the site.

It is this author's opinion that by the very nature of the land and the recent urban renewal developments in the area, that to sustain any form of industrial operation on this site would be to destroy any opportunities for making this area compatible with the new public housing area.



Fig. 30

View of typical home located in the area referred to as the "Corner of Celebrities".

The residential area just north of the old state warehouses is heavily blighted to the extent that many of the structures are beyond repair. This condition is contrasted sharply by the newer subdivision on the east side of Wilkinson Street.

Area number ten is known locally as the "Corner of Celebrities". This is the historic core of Frankfort where many of the original homes built during the late 1700's and early 1800's still exist in unusually good condition. Many of the homes have been built of hand made brick and remain as structurally sound as the day they were built.

There are only two areas within the "Corner of Celebrities" which take away from the historical aura. One is the site of the old city ice plant (now removed) and various old commercial buildings located west of Wilkinson Street between the railroad bridge and Main Street. This entire area, excepting one house of historical significance, will be cleared under the city's urban renewal program. The second site is located at the southern end of Wilkinson and Watson Court and the river. Included are 10 to 12 single family homes which are substandard due to their size and physical condition.

Due to the increased land values the city is expecting this area to be redeveloped for higher density residential use. The attractive tree-lined riverfront and stately old homes in the area could provide the necessary impetus for redevelopment.

Along the riverfront, between the homes and the shoreline, is a natural tree shaded terrace ranging from 100 feet to 150 feet in width and extends along the entire river edge from the

L&N Railroad Bridge to the Frankfort Boat Clubs Marina. Although the terrace is subject to flooding, it holds great potential as a riverfront park. Riparian rights of the property owners has excluded this area from public use thus far.

At the intersection of Wapping Street and Washington Street is the Bush Building. This building is located at the edge of the CBD fringe (as defined by the 1963 CBD Study) and houses various state offices. Fortunately, the architecture of the structure blends very well with the Greek revival and Federal style architecture of the old mansions to the west and north.

The street pattern and platting of lots in this area is incompatible with the bend of the river. The result of this layout, by General Wilkinson in 1786, has left a mixture of short and long narrow lots containing either too little or too much usable space. See Figure

The area between Washington and St. Clair Streets contains a municipal parking lot, and the city library. Between the city library and the river, is the public boat launching ramp and a marina operated by the Frankfort Boat Club. During the summer months and especially on weekends the single land launching ramp is often used beyond its safe capacity. Access to the ramp is by means of a narrow one-way drive along the east side of the library. When the drive is filled to capacity, it is not unusual to see cars and boats lining Wapping Street and oftentimes creating traffic snarls at the intersection with St. Clair. The municipal parking lot provides for temporary car and trailer parking only

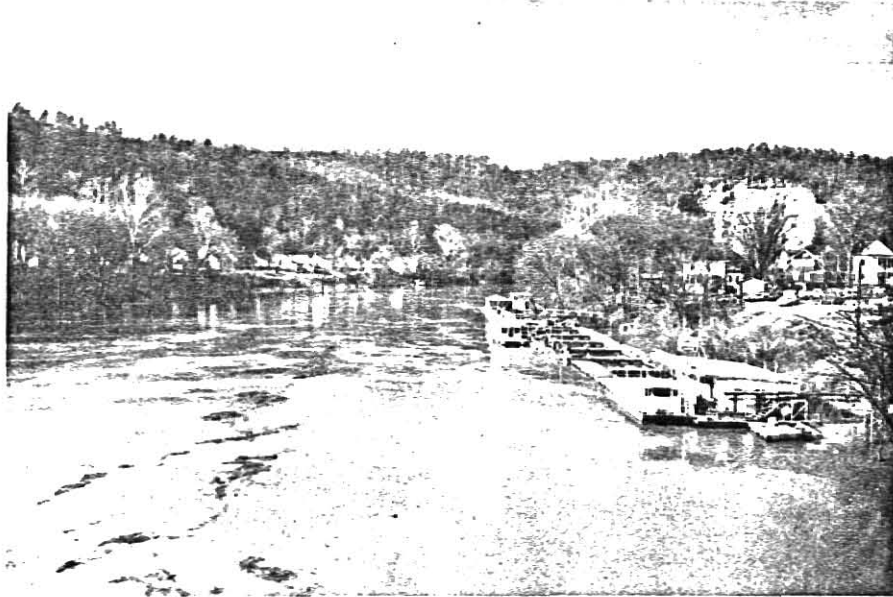


Fig. 31

View of Frankfort boat club marina.



Fig. 32

View of single lane launching ramp located at marina.

for the weekend.

The river bank below the parking lot is the most unsightly aspect of this section of riverfront. Little or no maintenance is provided to keep weeds and trash from collecting which often screens the marina and river from the viewer.

The marina facilities operated by the Frankfort Boat Club includes gas, oil, boating supplies, and dock space. The dock space is used only for boat club members.

The marina complex consists of a main service dock and 1200 feet of dock space which accommodates a total of 90 boats. The boats are moored parallel to the head dock to keep the larger boats from protruding into the channel, thus taking up a great amount of head dock space.

Anchorage for the marina is by means of a cable system tied to the adjacent bank. During seasonal water fluctuations, the cables have to be constantly adjusted to compensate for the rise and fall of the stream.

The total maintenance and operation of the marina is handled by the boat club. Although the city of Frankfort leases the riverfront space, there is little evidence that it expends any funds for maintaining the shore line or launching ramp.

Area eleven is composed of a major sector of the central business district, situated east of St. Clair Street to Capital Avenue and south of Main Street to the river.

Within this section of the central business district there are four major businesses, various specialty shops, service shops, one quaisi public building, and a parking lot. Few of the build-

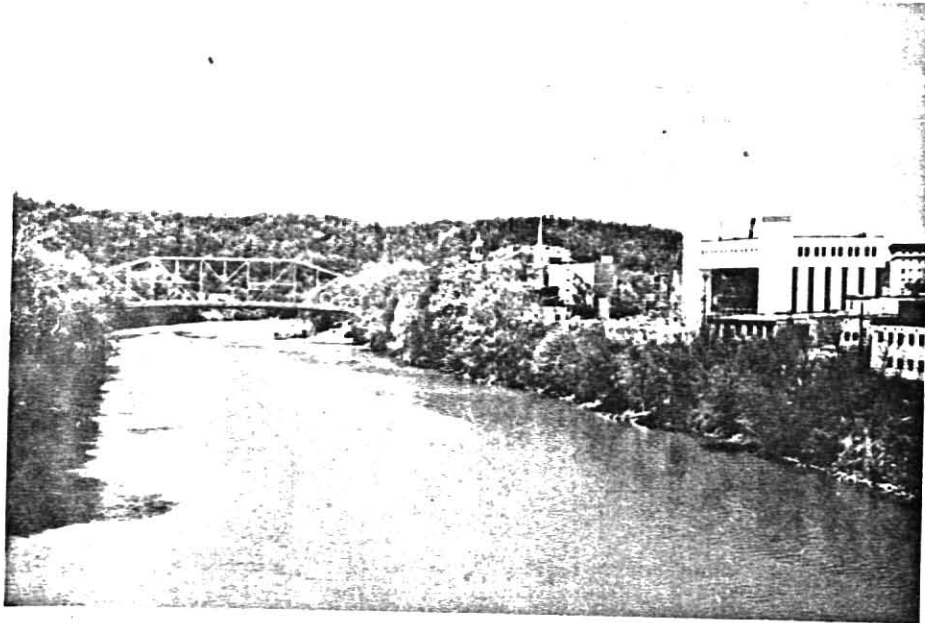


Fig. 33

View of central business district area 11.

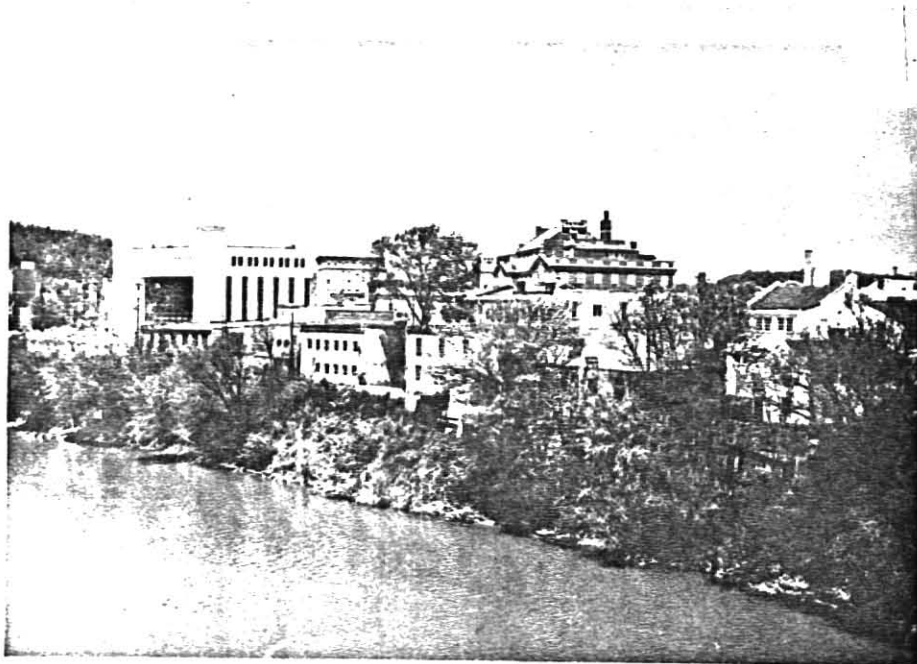


Fig. 34

View of central business district in area 11.

ings or businesses have been related to the riverfront except a new bank building at the corner of Main Street and Ann Street. This recently completed building was designed to accommodate a large riverfront terrace which is accessible from an exterior pedestrian walkway as well as from within the bank. Architecturally the building has bold contemporary features which contrast with the 19th century architecture of other buildings. The construction of the bank building at this location is a giant step towards the emphasis of riverfront orientation.

The small businesses east of the new bank are primarily service oriented and therefore depend on a street orientation. Due to the narrow depth of the lots there is no rear access to the buildings nor any extra customer parking excepting the parallel parking at the street.

Future redevelopment of the central business district will include removing vehicular traffic from St. Clair between Wapping Street and Broadway and Main Street between Madison Street and Lewis Street. These streets will then be rebuilt in the form of a pedestrian mall to make the shopping core more attractive. As it now stands, all street parking is parallel to the curb line to allow for traffic mobility. This form of parking has forced the construction of public parking lots within and near the central business district shopping core. One parking lot in particular is located along the riverfront where it takes up valuable retail commercial and riverfront space.

In a 1963 CBD Study the author brought out the fact that

the central business district was lacking in space both for expansion and the parking to go with it. Today, this is even more evident since the newer suburban shopping centers are so very popular.

Area number twelve is a narrow strip of riverfront land lying east of Capital Avenue and adjacent to the L&N Railroad tracks. The existing land use includes a small lumber yard and a limited amount of warehousing. The buildable land area is now totally utilized. The topography and geology on all sides is such that future expansion of existing facilities would be regreted.

Immediately behind the lumber yard to the north is the "Old Arsenal", one of the major landmarks of Frankfort. The "Old Arsenal" was built in 1850 during the Civil War and is now used as a headquarters for military supplies.

Area number 13 comprises Frankfort's historically significant community cemetery. The cemetery is located some 350 feet above the river giving the visitor a commanding view of north and south Frankfort and the Kentucky River Valley. The major historical attraction of the cemetery is the grave of Daniel Boone and his wife, Rebecca. Each year thousands of tourists frequent this site as part of the city's "Boone Tour" of historical sites.

Area number fourteen- The 1959 "Community Facilities Plan" for Frankfort, prepared by the Kentucky Department of Economic Development, made mention of this area as a potential riverfront park to satisfy needs for neighborhood recreational facilities. The study reported that "by 1970, it is also recommended that a

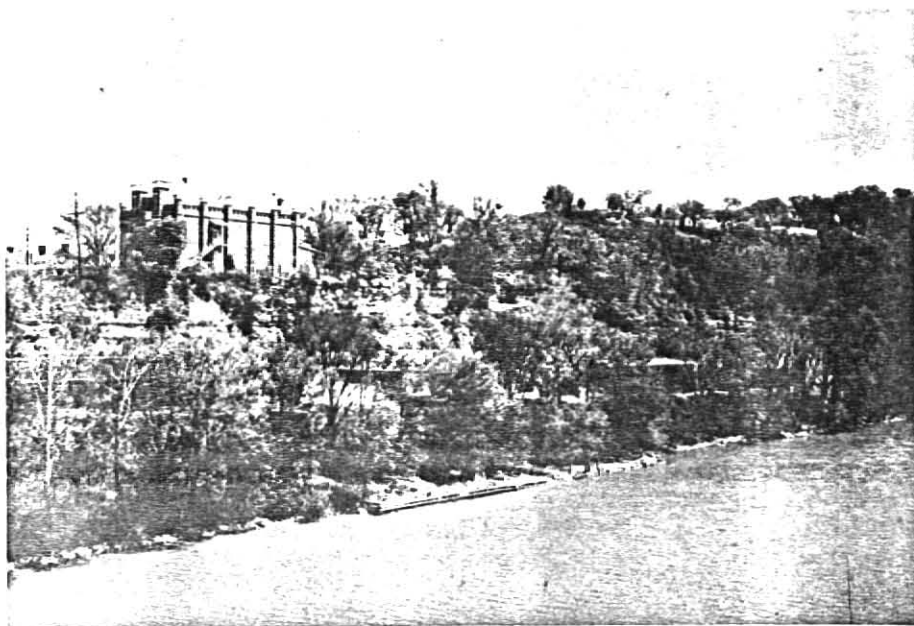


Fig. 35

View of areas 12 and 13 showing the "Old Arsenal
and the overlook of the Frankfort cemetery.

neighborhood park be developed to serve the South Frankfort area, an area which is without park space at the present time. An inactive private park is located along the river south of Fourth Street adjacent to a tract of undeveloped land. Developed together, these properties will provide a park of about five acres that will meet a long time need of this neighborhood.²⁶ To date the city has been unable to acquire the land. The site still remains in its original condition.

Area number fifteen is the largest of all riverfront land parcels included in this study. This area is the site of the Kentucky State Hospital Farm which is no longer in operation. The site is bounded on the east by Glens Creek Road and on the south and west by the Kentucky River. The L&N Railroad maintains a set of tracks which bisects the site longitudinally north and south.

The significance of this parcel of state-owned land is that it has been zoned for industrial purposes due to its proximity to the rail lines and to the river. The state has not relinquished its use for that purpose due to the fact that the area is visible from the capital and governor's mansion.

Not until late 1970 was the land released for public use. A local civic organization, The Capital City Softball Association, leased the property from the state for one dollar with the provision that they (the Softball Association) would make certain improvements each year. If the Softball Association does not meet these requirements, the lease is to be cancelled.



Fig. 36

View looking east towards top of hill and old dairy barns.



Fig. 37

View looking northwest towards Kentuck State Capitol.

The topography of the site ranges from the very flat to slightly rolling at the lower elevations, to steep hilly terrain at the upper elevations. During the period when the farm was in use, the lower elevations, west of the railroad tracks, were used as crop land. The area east and above the railroad was kept in native bluegrass for grazing purposes.

The existing farm buildings include a large dairy barn, a feed storage building, a machinery shed, and two small utility buildings. All of the buildings remain in good physical condition and have potential for being converted to other uses.

At this time, the only means of access to the old farm is by Glenns Creek Road which intersects at East Main Street adjacent to the Frankfort Cemetery. The heaviest traffic on this road is received by large trucks hauling gravel from a mining area south of the farm. This type of traffic coupled with a dangerous rail crossing and blind turns makes Glenns Creek Road an undesirable means of access to this site.

A proposed four-lane arterial roadway to connect Todd Street and Versailles Road will eliminate the problem of access. The proposed routing is shown in Figure 42.

Area number sixteen, to the west of the State Hospital Farm between the Kentucky River and Lawrenceburg Road, is the largest parcel of riverfront land which is most frequently subject to seasonal high water. Existing developments are very sparse and are primarily limited to the least floodable area along Lawrenceburg Road.

The majority of the land is in agricultural use excepting a small grocery and a commercial marina with dry-dock facilities. The marina provides dock space for large house boats, fuel supplies and minor boat repairs.

From all previous planning studies there has not been any mention of zoning this area for any purpose other than agriculture. The major limitations of the site precludes its use for any purpose other than agricultural or recreational use due to the problem of flooding, a high water table and soil conditions.

The sum total of Frankfort's existing urban riverfront is a mixture of all types of urban land use. In general, the type of land use permitted was not always the undesirable factor. The most undesirable nature of the land use was the condition of the structures and the general lack of public accessibility to the water's edge. Of the 30,000 feet of urban riverfront land, less than 7% was designated specifically for public access purposes.

The condition of the riverfront shoreline was, in most cases, lacking in any form of maintenance to keep weeds, trash, and/or erosion control measures from becoming unsightly. Several stretches of riverfront embankments which were rip-rapped with a combination of broken concrete, brick, and rubble were the most visually obtrusive when viewed from the water. These areas collected additional floating debris carried by the river during periods of high water.

In all cases the condition of the shoreline was indicative of the adjacent land use and structures. Where blight was most

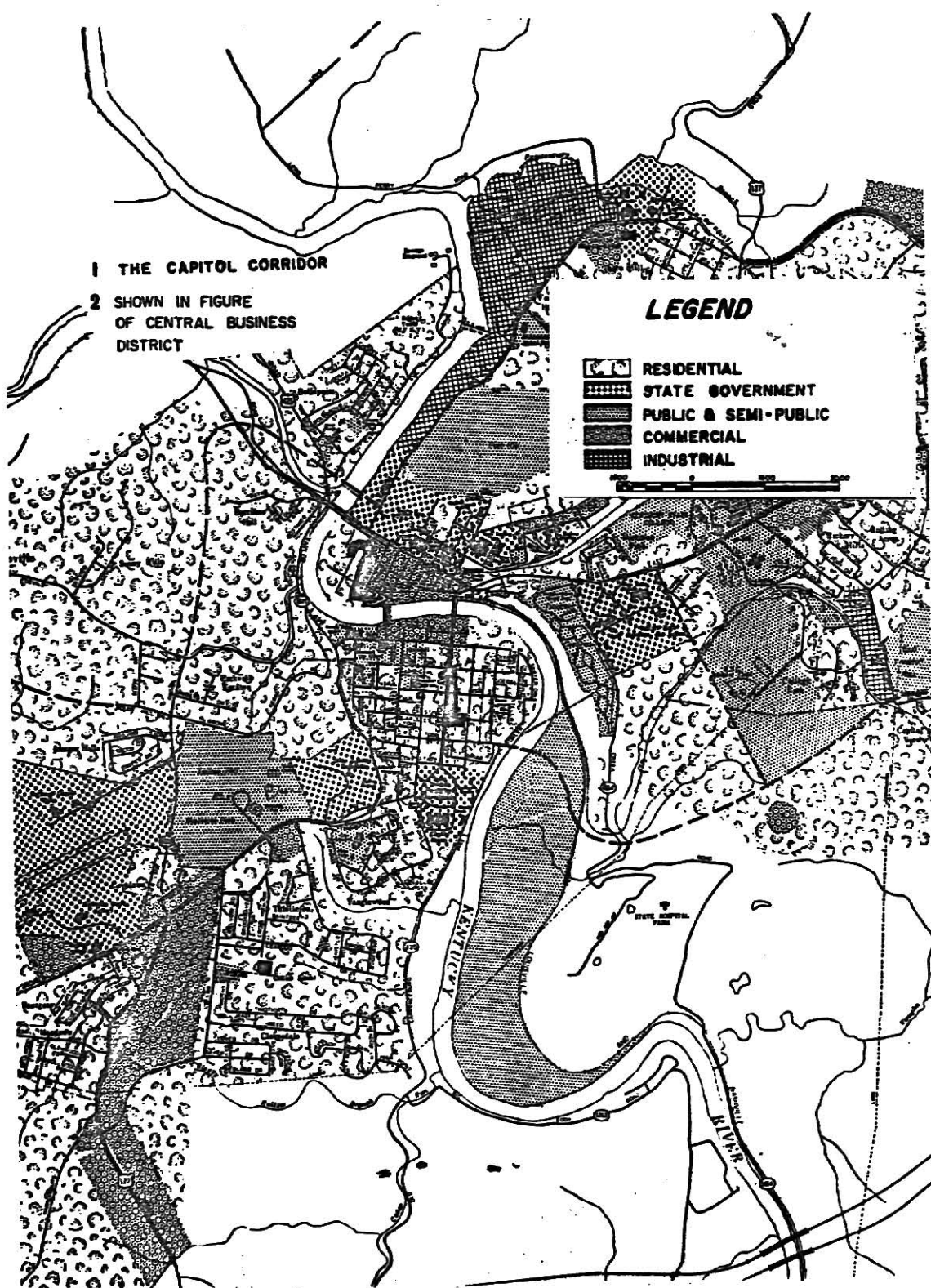


Fig. 38

Proposed land use for Frankfort and Franklyn County, Ky.

prevalent, there were more cases of a complete disregard for the condition and appearance of the shoreline. The only area which exhibited any effort toward shoreline development and maintenance was opposite the residential area along Paul Sawyer Drive in South Frankfort. In this case, the residences were focused on the riverfront and the shoreland embankment had been terraced and landscaped.

(b) The Latest Proposed Land Use of Frankfort's Urban

Riverfront: In August of 1970, the city of Frankfort and Franklin County received the latest revision to its land use plan. With few minor revisions the city-county planning commission ratified the plan in May of 1971.

The primary differentiation between the 1970 plan and the 1960 plan (riverfront land use) was that the 1970 plan eliminated the mixed land uses along Wilkinson Street riverfront; and the 1960 land use plan recommended the Old State Hospital Farm for industrial uses whereas the 1970 land use plan recommended its use for public purposes.

The 1960 plan contained the only actual proposals for development of urban riverfront land. Riverfront development that was specifically cited called for the designation of certain riverfront lands for public access sites for recreational purposes. Neither plan makes any statement or reference to the river as a planning element or focal element.

2. Resource Inventory. The Methodology for this approach to Resource Inventory was based on two broad resource categories;

(a) man-made resources; and (b) natural resources. Each resource category was then broken down into sub-categories covering specific types of resources such as water resources, plant resources, topographical resources, historical, and cultural resources.

The visual nature of certain resources was also mapped. This included considerations for such items as condition and the point from which the resource is viewed.

As the data was collected, it was mapped on mylar (clear plastic) sheets over a base of maps of the study area. The maps and overlays were then analyzed to determine patterns and relationships within and between various areas.

3. Resource Analysis. Once the resource inventory was completed, all scientific data pertaining to physical properties and ecological relationships were compared to the areas inventoried. Those elements which were primarily visual resources were analyzed on the basis of their architectural elements which were focal points of the community and were located within the visual realm of the riverfront.

4. Developmental Concept. Based upon the analysis of existing land uses, proposed land uses, and the resource analysis, a total developmental concept was reached. Previous urban riverfront studies were used to gauge the concept in terms of its total scope.

The developmental concept for this study was based upon the preservation and conservation of the urban riverfront thru the creation of use areas which would have symbiotic relationships

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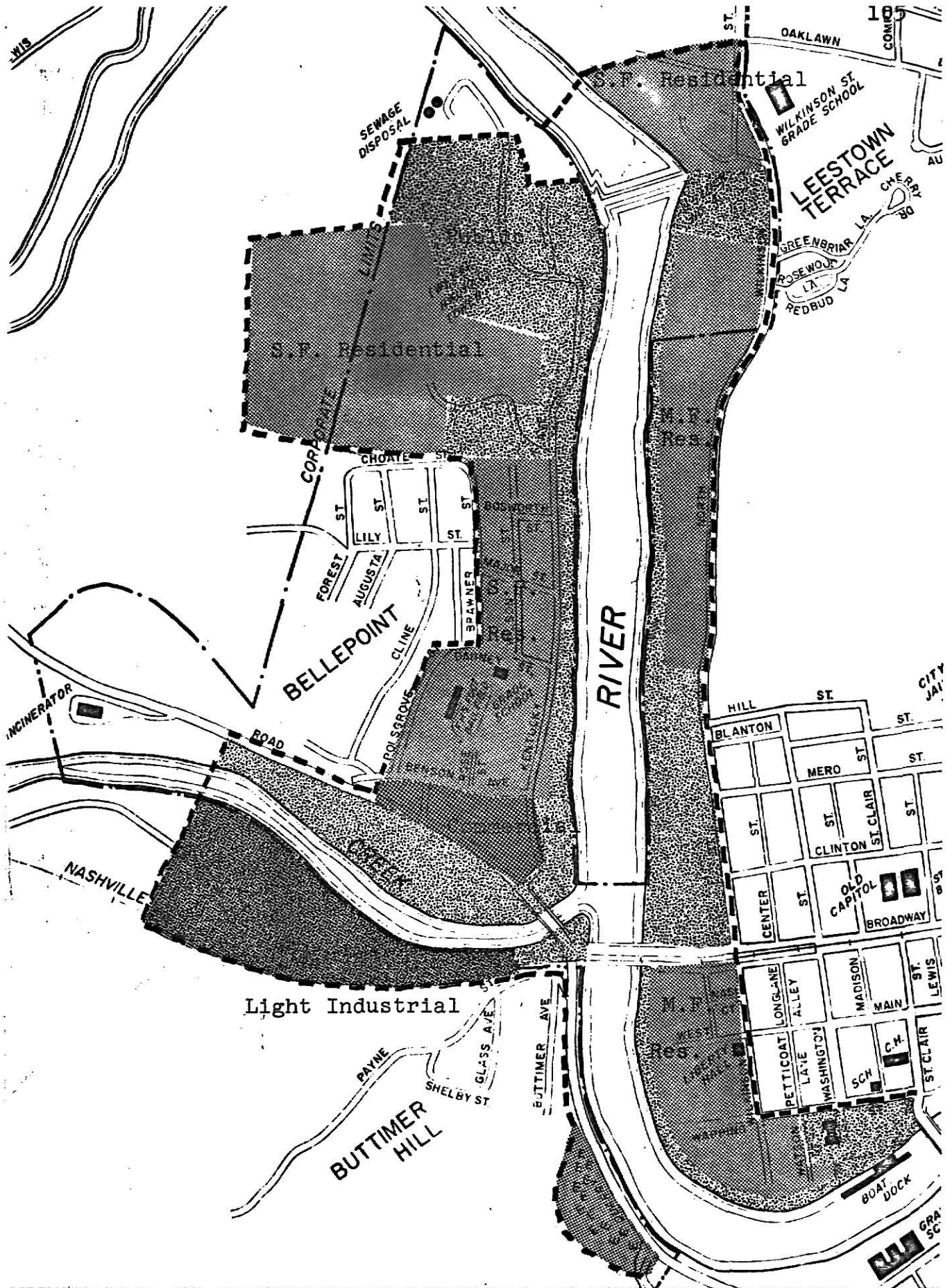


Fig. 39

Proposed riverfront landuse.

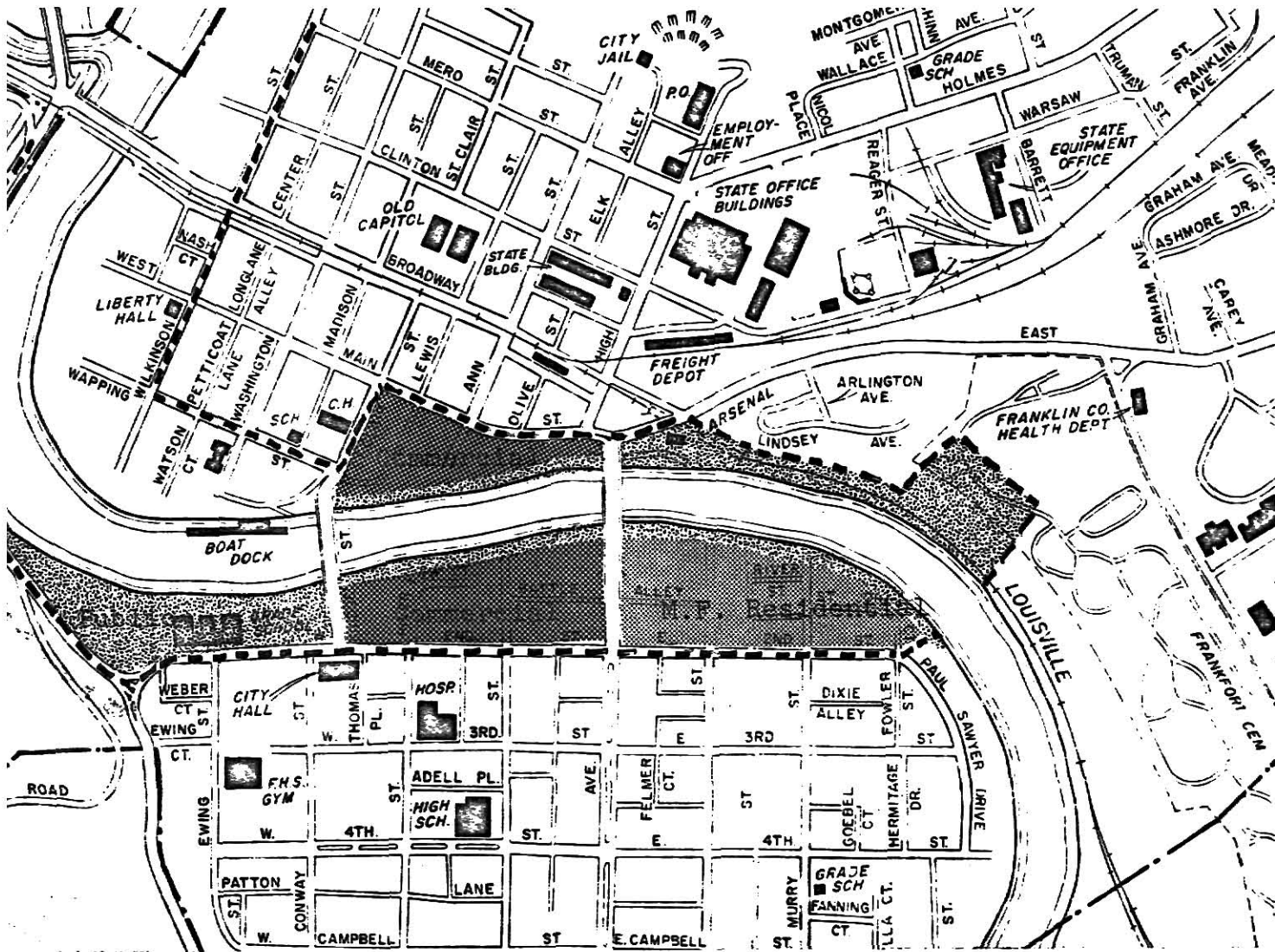
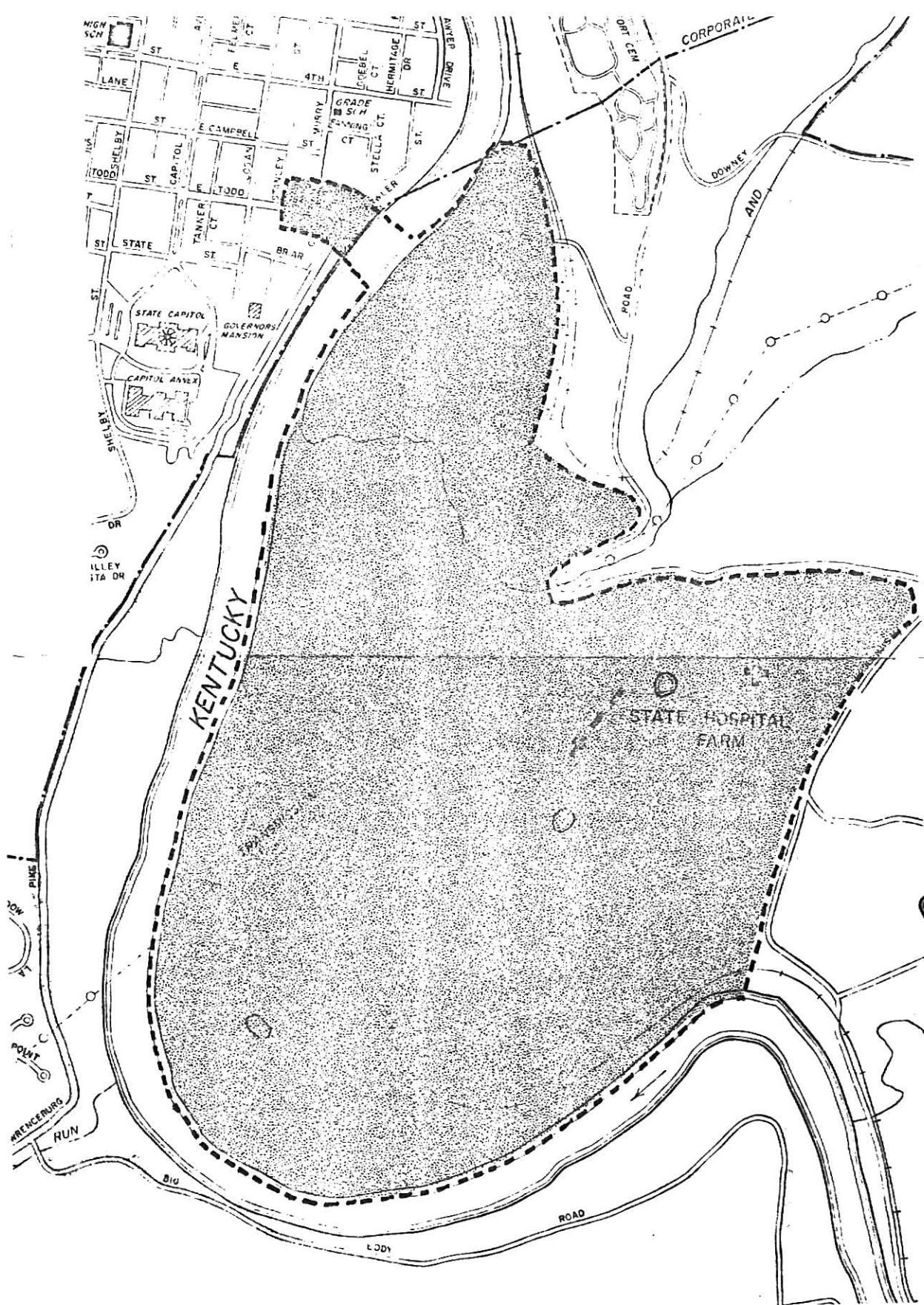


Fig. 40

Proposed riverfront landuse.



07

Fig. 41

Proposed riverfront landuse.

between the natural environment and the man-made environment. In order that this concept is sustained, the public must refocus its attention and attitudes such that the urban riverfront can again become an active and viable part of a community's life, now and for future generations.

5. Proposed Urban Riverfront Land Use Plan. The urban riverfront land use plan proposed herein, reflects the needs of the riverfront as well as the community as a whole. The major differentiation between this proposal and preceeding proposals, is the recognition of the riverscape as a necessary planning element to be recognized and emphasized.

(a) Water Surface: The water surface within the jurisdiction of Frankfort's incorporated limits was zoned such that surface use could be regulated to reflect the needs of specified water use areas for recreational purposes and marinas, as well as adjacent land uses. Two significant stretches of water surface would have to be brought into the city limits. The first area extends south from lock and dam number 4 to the Broadway Street Bridge. The second area would extend south and up-stream from the city water treatment plant to the Interstate bridges.

(b) Residential Land Use: In areas one, two, eight and ten the existing and proposed residential land use was sustained in order that the existing neighborhood patterns would not be altered. The major addition to these areas was the provision of public access points to the riverfront.

Area nine was a major residential addition from the prev-

ious industrial use proposed by Frankfort's 1970 Land Use Proposal. This change from industrial to residential use was important to keep mixed land uses from the riverfront as well as provide the much needed open space for the newly developed public housing along the east side of Wilkinson Street. Other factors which excluded the existing industrial use from this area were the noise, dust, and visual pollution created by their operation.

(c) Commercial Land Use: Commercial land use along the riverfront was limited to two areas. The first area is located at the south end of the Bellpoint Addition between the intersection of Bald Knob Road and Kentucky Avenue and Benson Avenue. This area which is now a mixture of small stores and single family residential would be enlarged to facilitate a suitable neighborhood shopping center capable of serving the Bellpoint Area.

The second area falls within the existing limits of the central business district. The commercial land use plan in this area, as proposed by the recent 1970 Land Use Plan, is justifiable by the pressing need for commercial space with suitable parking.

(d) Industrial Land Use: The only site proposed for industrial land use in this study was designated for area four which lies south of Benson Creek. The 1970 Land Use Plan proposed this area for residential use but due to the train and truck traffic through the site, future construction of the Parkside Drive-Clinton Street connector it would contain undesirable conditions for any form of residential development.

Light industrial and warehousing land use was proposed due

to the fact that the new road construction through the site would facilitate filling of low areas subject to seasonal high water plus the added advantage of existing rail lines and roadway connections to Interstate 64 and major points throughout the city.

Regulations restricting industrial operations which pollute the land, air, and water would insure the proper development of this site.

(e) Public and Recreational Land Use: The designation of public and recreational land use by this study was the greatest change in land use from previous studies. This was due to the fact public access areas along the riverfront were treated with much more attention and significance than any previous land use plan.

In addition to the riverfront park along Wilkinson Street, there were six major public access areas designated. These included a neighborhood park adjacent to the U. S. Army Corps of Engineers' property at Lock #4, a municipal marina on Benson Creek, a riverfront promenade adjacent to the historical "corner of celebrities", additional recreation space for the Second Street Elementary School, a neighborhood park at the end of Fowler Street, and a major community recreation area located on the Old State Hospital Farm. The sum total of seven major public access areas along the river provided the balance of public recreation and open space land required by the 1970 land use study.

The most significant factor behind the designation of these lands for public use was to protect and preserve as much of

the river's edge and riverfront land as possible. The historical significance of the riverfront is an additional reason to preserve certain sections of the riverfront so that future generations may be made aware of the important riverfront developments which initially led to the growth of the community.

6. Design Proposal.

(a) Area One: The physical changes recommended for area one were based partially upon the developments for area two. The criteria used was based upon the fact the Bellpoint area lacked in basic retail services, public open space, recreation facilities, and visual amenities which would attract new property development. With the addition of a suitable neighborhood shopping center, modern multi-family housing, improved street circulation, and a common riverfront park, area one would then have great potential for new growth.

The riverfront development has as its major focal point, the U. S. Army Corps of Engineers Lock and Dam number four. The lock and dam, built prior to the Civil War, is open for public inspection during the daylight hours. The proposed addition of public parking and pedestrian walkways to the locks provides easy access to the recreation areas, picnic facilities, and fishing spots adjacent to the river. Interpretation and signing of the major points of interest would provide the visitor a more complete history of the lock facility since its use was important to the early growth and development of Frankfort and northern Kentucky.

The single family subdivision was planned in such a manner that the lots could be connected to a common public pedestrian path system. The paths are connected to the recreation areas along the riverfront as well as the riverfront walkway extending along the shoreline.

The major recreation area north of the subdivision would

serve the Bellpoint neighborhood with badly needed recreation space which it now lacks. Access to the recreation area can be had by means of pathways as well as by vehicular means. The twelve-acre site provides space for two baseball diamonds, and two multi-purpose field sports areas. The proximity of the recreation area also acts as a spatial buffer between the subdivision area and the municipal sewage treatment plant.

(b) Area Two: In order that the Bellpoint area receives its needed "shot in the arm", a major renewal of the residential and commercial area was proposed. A super block was created along the riverfront in order that an uninterrupted and more spacious shoreline area could be developed. Within the super-block, clustered townhouse housing units were planned to provide free open space and public access to the water's edge. This form of housing also maintains the relative density of the detached family units adjacent to the renewal site while providing a much greater open space ratio.

The use of apartment units adjacent to the shopping center provides a balance and variety of housing unit types. This area was appropriate to apartment units due to the proximity of the neighborhood shopping center. The major traffic arterial, Bald Knob Road, gives access to the central business district and the new office building to the west.

The neighborhood shopping center encompasses the existing commercial land use area. Within the center would be included the essential grocery store and several small shops which

serve not only the Bellpoint area but the Buttimer Hill addition, and proposed housing additions along Wilkinson Street.

Shoreline development below Benson Creek would consist of improving the embankment in order to prevent soil erosion during periods of high water. Shoreline improvement would also provide for the inclusion of an eight foot wide pedestrian walkway. The walkway would provide for egress along the riverfront as well as access to the water's edge. Access to this riverfront walkway has been planned in order that pedestrians have access from the residential areas to the west.

(c) Area Three: The proposed development in this area is reflected by a 1969 urban transportation study prepared by the Kentucky Department of Highways. The study brought out the fact that by 1991 the total average daily traffic volumes affected by the new capital plaza and the widening of Wilkinson Street would require an additional bridge (4-lane) and 4-lane road section to connect Clinton Street and Parkside Drive. Other factors such as the expected growth of west Frankfort put additional emphasis upon this addition.

The proposed alignment and physical character of this proposed arterial roadway will be critical not only in terms of its function but its impact upon the visual character of the riverfront and Benson Creek valley when it is carried out. The alignment, as proposed in this riverfront study, has also taken into consideration the effects of roadway construction and the

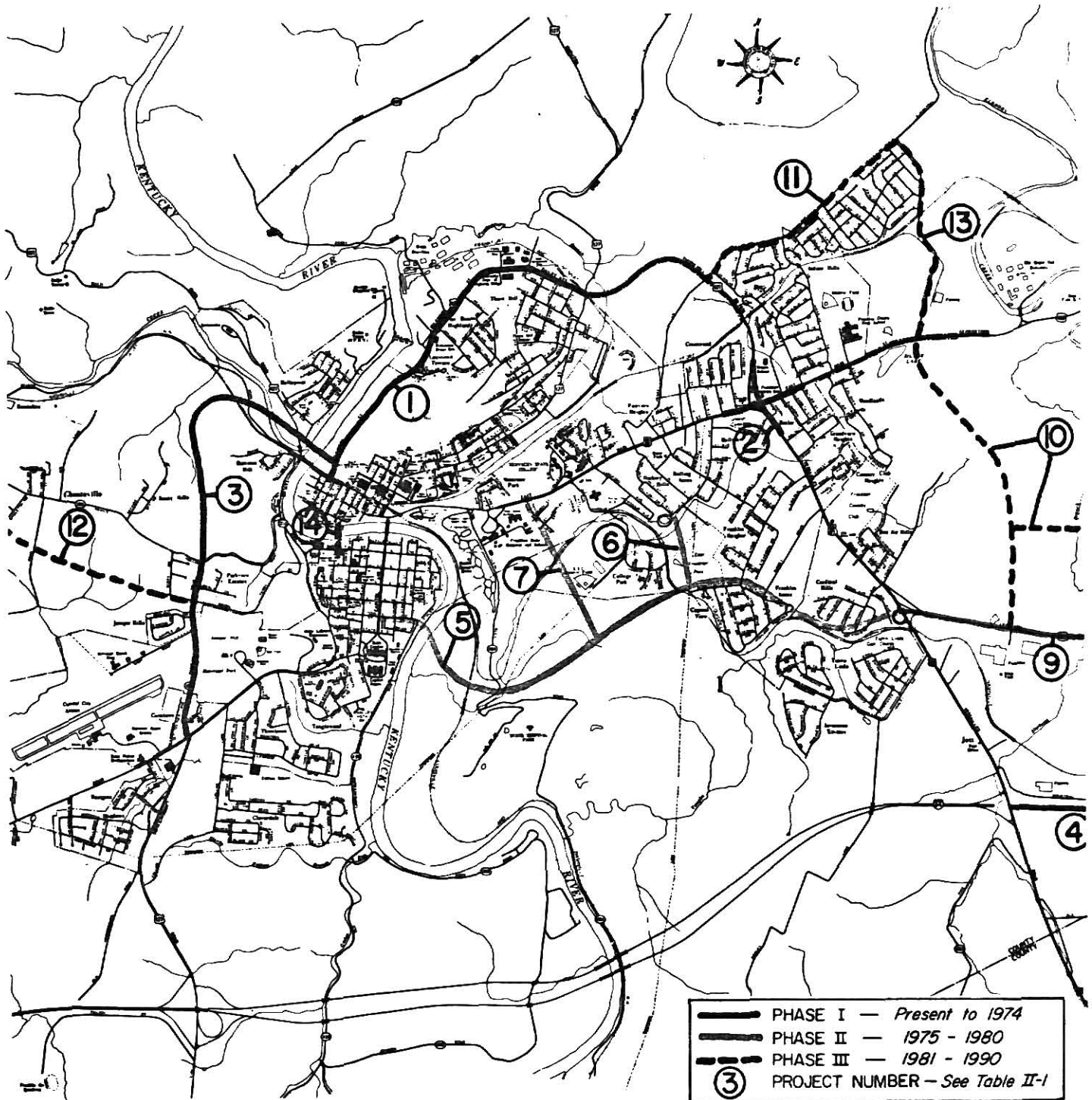


Fig. 42

Proposed roadway alignment for Clinton Street-Parkside Drive and Todd Street connector.

benefits that may be accured if proper planning is implemented.

As proposed in this study, the alignment will require the crossing of Benson Creek at a point where the roadway gradient can meet the alignment extending south to Parkside Drive. From preliminary examination of the area, this alignment seemed most feasible due to the topography and possible vertical curviture of the roadway.

The effect of this alignment was that it physically and visually bisected area four, to the south of Benson Creek, but did not inhibit the use of the land.

The development of area three for a municipal marina would be made possible by the construction of the Clinton Street-Parkside Drive connector and the operations of the municipal sanitary land fill near the city incinerator. The area east and south of the proposed roadway has already been used as a borrow pit for land fill in the construction of a dike along Wilkinson Street. Plans for development of a marina and the road construction could be coordinated such that the additional borrow material taken out would provide a protective harbor for a marina operation.

This location for a marina was ideally suited due to the protection it would receive. The back-water of the Kentucky River slows the current of Benson Creek at this point thus negating the problem of water pressure against dock structures which now exist in the main river channel. During high stream flow on the Kentucky River, this location would provide much greater protection for

the boats as well as eliminating the possible dangers created by floating debris.

Other factors, which reinforced the need for expanded marina facilities, were brought out during this author's survey of existing marinas and boat docks. During periods of high use, traffic problems were created by the fact that there was only one public launching ramp in the city and it could only accommodate a single launching or loading operation at any time.

The proposed marina location would eliminate much of this congestion by providing at least a four-lane launching ramp with a holding area. The holding area allows for the vehicle, boat, and/or trailer to pull out of the main stream of traffic which would be proceeding directly to the boat docks. A separate parking area for day use boaters was provided in order that a closer relationship between launching, parking and loading could be had.

Parking for the marina would allow for one parking space per boat slip with additional space for visitors and non-boaters. Circulation through the parking area would be one way which would facilitate service and a drop-off zone at the dock head.

Controlled access to the mooring slips would be through the dock head where basic services would be handled. Aside from the basic boating services, the head dock would provide for a public observation deck. Due to the aura and attraction of marinas and boats, it was felt that this type of a facility would provide the non-boating public with an opportunity to become passively involved with the riverfront atmosphere.

Access to the marina other than by vehicular means was also planned. This was carried out by the extension of the river-front walkway to the marina area, thus allowing the residence of Bellpoint the opportunity of free access to the site without confronting vehicular traffic.

The river access to the marina at the mouth of Benson Creek is sufficient to allow clearance for all types of pleasure craft. Since the locks and dam maintain a constant water elevation (excepting periods of high stream flow), the natural backwater created by the river would also insure the clear-draft for the larger boats.

The location of the marina with respect to the Kentucky River channel, provides for much greater protection to the water craft than do the existing marinas directly on the river. During periods of high stream flow the existing marinas are confronted with constant adjustments in their anchoring systems along with the added danger of floating debris causing possible damage to the boats and docks. The angle with which Benson Creek meets the Kentucky River would prevent this type of a problem.

The development of a marina at this location will provide various visual amenities. The view from the proposed Clinton Street-Parkside Drive will give the Frankfort visitor a scenic taste of the communities life and activities on the Kentucky River.

The marina also has great potential as a night time attraction. The atmosphere of the boats, lights, and water would

make a suitable setting for a restaurant planned as part of the head-dock. The restaurant would be an appropriate activity with which the non-boater could identify.

(d) Area Four: Due to the problems of industrial truck traffic and rail traffic, this area was not considered for residential development as proposed by Frankfort's 1971 Land Use Plan. The addition of the Clinton Street-Parkside Drive Connector which physically and visually bisected the site provided reason for eliminating this form of land use.

Warehousing and Light Industrial land use was planned for this site due to the existing rail service and the close access to the proposed major arterial. The Clinton Street-Parkside Drive Connector would give easy access to and from the Interstate-65 as well give direct service to the central business district and outlying shopping centers.

Site conditions too would permit the construction of buildings requiring large floor areas on a single level without excessive site preparation. The small amount of land lying adjacent to Benson Creek, which is more subject to flooding, can be reclaimed by means of compacted land fill. Coordination of the proposed roadway construction and the reclamation of the site would help to guarantee the proper development of the light industrial park.

Considerations for the type of light industry and/or warehousing allowed to develop on this site would be limited to plant operations which do not produce smoke, noxious odors, noise or

add pollutants to the adjacent stream. Insurance against any form of pollution would be policed and regulated by the Kentucky Air and Water Pollution Control Commission.

Vehicular circulation within the site was improved by the realignment of Benson Valley Road. The realignment produced better functional site relationships and a greater number of sites adjacent to the rail lines.

Natural screening and buffering of the entire site was provided by the existing forested slopes on the south and the tree lined creek. The only possible view into the site would be from the elevated road section bisecting the site. The author felt that further screening would be unnecessary if proper site development around the buildings were carried out to reflect the natural surroundings. Thus, the view over the development would not appear obtrusive.

(e) Area Five: From all indications, either from the site analysis or from personal interviews, this area was one of the most limiting sections of the riverfront in terms of development potential. Improvement of Taylor Avenue between Devils Hollow Road and the Broadway Street Bridge is difficult due to the steep wooded hillside on the west and the river bank on the east. Exclusive of the abandoned rock quarry, this short section of street offers the motorist one of the most picturesque views of the river available in Frankfort. Since this area is not within the corporate limits of the city, it does not receive proper maintenance and therefore suffers from visible litter and ne-

glect.

As mentioned previously, there has not, as yet, been any equitable use found for the abandoned rock quarry. The area in front of the sheer rock hillside is usable but is limited by unstable rock from above and presents a constant danger to anyone who should enter the site.

The conclusions reached by this study calls for the upgrading of Taylor Avenue. This could include new paving, curb and gutter, and a pedestrian walkway adjacent to the river with the necessary protective guard rails. The pedestrian walkway would be a continuance of the riverfront walkways called for in the redevelopment of the "Bellpoint Riverfront".

A major pedestrian terrace was planned opposite the Devils Hollow Road intersection. At this point the pedestrian would have a panoramic view of a large portion of the Frankfort riverfront. Cantilevered over the water the terrace would also provide a suitable perch from which the visitor could fish.

Maintenance of the trees along this section of the river bank was found to be most important. This would be necessary since the river erodes the shoreline and the trees and ground-cover helps to contain this erosion.

A logical solution for the reuse of the stone quarry was not fully reached due to the author's limited knowledge of the geological problems involved. Stabilizing the rock cliff such that the land could be used was the most apparent problem. A rather bold conclusion was reached which involved the construc-

tion of a high rise structure against the face of the sheer rock cliff so that it essentially acts as a stabilizing element for the rock.

The caves at the base of the cliffs are in fact large enough to accommodate the parking of vehicles such as a car. The balance of land in the foreground would then be developed as an entrance space and site planned accordingly.

The structure itself would essentially be exposed only to the east with the riverscape and the city providing a panoramic scene for the inhabitant. The actual use and/or feasibility of the structure, either as an apartment building, an office building, or a combination of both would have to be borne out by further study.

(f) Area Six: The development of area six centers around the future expansion of the Second Street Elementary School. At this time the Second Street Elementary School serves as the only neighborhood recreation area for south Frankfort. The expected growth in enrollment also adds to the need for more recreation space.

As called for in this plan, all existing residential land use would be phased out. This also includes the few service shops at the intersection of Taylor Avenue and Second Street.

The major emphasis toward development of this area for recreation and public open space provided a better land-use relationship for the school. The ring of commercial shops around the school only complicates the problem of traffic and pedestrian

access to the site.

The concept of site development was inspired partially by the fact that the additional recreation and public open space needed for the south Frankfort residence could be coordinated with the total riverfront plan. Although not centrally located, idealistically, this area is easily accessible either by vehicular means or by foot. As part of the extensive riverfront walkway, this site would become a significant public activity nodule.

Various forms of active and passive recreation would be feasible for this site. Picnicing, creative play areas, fishing balconies, and small court games should be developed such that the public and school would mutually benefit.

Limited vehicular parking along Taylor Avenue was also planned. This could enable the "driving for pleasure" motorist to stop and physically penetrate the site as a pedestrian.

(g) Area Seven: The planned development of this three-block area along the river was supported, in part, by the results of a 1963 Central Business District Study for Frankfort. In this study the authors stated that "the successful downtown of the future must have the excitement and interest of a bustling commercial center, but it must also become an area of beauty and convenience designed to meet human and civic needs.

Very little change has taken place since that 1963 CBD study was completed. Outward growth of the CBD core is limited physically by an established historical neighborhood on the west. the reluctance of business to cross the railroad tracks to the

north, the steep topography to the east and the river as a natural barrier on the south. Thus, the land along Second Street between Bridge Street and Capital Avenue has been the only possible and natural area to expand towards.

The advantages of this site for commercial development include easy accessibility, parking space, and an opportunity to develop a commercial area designed to take full advantage of the natural beauty and open space offered by the riverscape. The development of this site included the planned location of the structures away from Second Street and focused on the riverfront. The entire three block complex would be made up of small shops, a hotel and convention center, an office building, and a major department store. Each building complex was planned such that a common riverfront walkway could be utilized. The primary emphasis on access between the buildings would be away from the parking area.

A clear distinction between the four building masses was reinforced by the extension of the tree masses towards the parking areas. To the visitor entering the site, the effect would give a feeling of enframement and setting to the buildings. During the warmer months of the year, this atmosphere of water and shade could be an enticing factor attracting the shopper.

Aside from the attraction this development would have during the daylight hours, the evening hours could be visually exciting as well. Special effects lighting along the water's edge should give the visitor an entirely new experience.

(h) Area eight: Planned for virtually complete rede-

velopment, area eight reflects a possible solution to low cost family housing needed in south Frankfort. This pocket of decaying homes is made up of low-income ethnic families who live in this area out of necessity. Public assistance through urban renewal is one alternative to solving the housing problem.

Redevelopment of this site was planned around two objectives. The first was to plan clustered housing units such that the inhabitants could enjoy a park-like setting provided by the natural open space of the river. Secondly, free pedestrian access and further open space was attained by clustering the units within a super block, undivided by streets.

At various points in the complex are public access points. These access points connect with the common public open space along the riverfront. At the center of the complex a public fishing dock was planned. This facility permits direct access to the water and a vantage point for the fisherman.

Direct pedestrian access between area eight and area seven would have been desirable, but upon examination of the bridge structure near the water's edge, there does not appear to be any means to continue a walkway around the bridge abutment. The alternative to this problem was to cantilever a walkway around the bridge abutment, and over the water, but there were serious reservations as to its feasibility.

(1) Area nine: The planned redevelopment of area nine also involves a major renewal of existing land uses. The mixed heavy industrial and residential land use is in direct conflict

from an environmental standpoint due to the unsightliness, noise, and heavy truck traffic that is generated from within.

At the north end of area nine, just below the Staggs Distillery, is a small single family residential area which is suffering a similar plight mentioned in area eight. There are fewer homes involved, but the greatest number of these homes front on Wilkinson Street making their presence a visual eyesore to the passerby. The fate of these homes has already been realized due to the proposed widening and straightening of Wilkinson Street which will remove all but a few of the homes.

The plan for this area calls for the replatting of the site in order to attain an interior orientation of streets and housing units. The cul-de-sac streets permits a greater number of living units to be related to the riverfront and a more equitable use of the land. Completing the design is the designation of a buffer strip between the distillery and the new subdivision. The 300 foot wide strip of land would be in the form of an easement to keep any future expansion of the distillery from encroachment upon the subdivision.

Immediately south and adjacent to the dam is the site of the old hemp mill. This decaying group of buildings is presently being used by the State of Kentucky for warehousing. Removal of the buildings is planned in conjunction with the realignment of Wilkinson Street.

The design for this site calls for the development of a small park to serve the adjacent neighborhoods. The park would

be composed of all-weather play surfaces, a shelter, and a river-front terrace and overlook above the dam. The site would require very little in the way of additional trees due to the existing masses of trees.

Access to the site is strictly limited to the pedestrian due to the limited area. In order that pedestrians east of Wilkinson do not have to cross the street, a pedestrian underpass was planned. This allows an unbroken flow of pedestrian traffic to and from the park.

Just south of the small park a group of town house units were planned to provide a transition between the single-family detached houses to the north and the apartment complex further south. The arrangement of the structures sustains the concept for continuous spatial and visual identity with the riverfront.

The apartment complex was planned with the same strong visual and physical orientation. The architectural character suggested in the plan gives a definite vantage point to each row of apartments. Secondary access from the living units would connect to the open spaces defined by the structures. Linking each space is a continuous riverfront walkway which extends south along the shoreline where it meets with the park opposite of the Capital Plaza.

The riverfront park opposite the Capital Plaza was designed and built by the Louisville District U. S. Army Corps of Engineers. The park was developed in conjunction with the flood control dike which extends along the west side of Wilkinson St.

from Broadway to the north end of the Capital Plaza. The primary use of the park will be appreciated by the residents of the city's public housing complex to the north and the hundreds of office workers in the Capital Plaza office building.

Access to the park from the east side of Wilkinson Street will become more difficult as traffic increases. To alleviate this problem a pedestrian bridge was planned to connect the upper plaza level with the crest of the dike. The actual bridge design would take into consideration the similar elevations at both ends of the bridge and the necessary clearance to the street.

(j) Area ten: A major change planned for this area follows the suggestion of the 1971 Land Use Plan for Frankfort. The land use plan states the necessity for providing a variety of housing types including high rise apartments, which will meet the varying needs of families in all income groups.

The site zoned for high density housing is the location of the old Frankfort ice plant which has been cleared from the site. This area lies west of Wilkinson Street and north of W. Main Street. The possibility of the site for a high-rise development offers an unusual vantage point with respect to the riverfront, the Capital plaza, and the central business district. The site is enclosed partially by an existing flood wall on the river-side. Below the wall to the water's edge is a natural terrace having been formed by the river.

Twin apartment structures have been planned due to the potential footing problems caused by the deep alluvial soils. The

height and mass of the structures will be definite limiting factors in the design of the buildings. The first floor elevation for each structure would be created above the top elevation of the flood wall in order that the flood wall would not become a visual or physical barrier at ground level.

Access to the riverfront terrace was created by the use of ramped walkways. This means of access from the upper terrace level allows for its use by the physically handicapped. The natural riverfront terrace extends to the south and along the shoreline where it widens and forms a much larger natural terrace. This natural riverfront terrace was found to be sizable enough to accommodate a major neighborhood park. Due to the more frequent flooding to this area, it was recommended that development of this area be limited to boat-side picnicing, bicycle paths, and walkways. The natural beauty of the site is created by the overhead canopy of trees and the close association with the stream.

As it now exists, this entire strip of land is in private hands. Should the city of Frankfort realize the value in purchasing this area of riverfront land, the public would find it easily accessible and exciting to use.

(k) Area Eleven: The redevelopment of area eleven was planned around the preservation of historically significant homes along Wapping Street. The clearing of the blighted homes in this area should permit the introduction of a new and well planned housing development, complimentary with the existing homes and the riverfront.

Between the row of historical homes and the proposed townhouse condominium, a buffered area was planned. This buffer provided a means of transition and screening between the two areas.

The architectural character of the townhouses seemed of great importance in this particular case. A contemporary architectural motif would be out of character and a direct visual conflict with the 17th century architecture. The use of classical details such as the "Federal Style" or "Georgian Style" would give empathy and unity to the development.

The arrangement of the townhouse units was based upon the use of a partial common-wall construction. This allows the units to be stepped back from the riverfront, both horizontally and vertically, in such a manner, so as to attain a riverside exposure for each unit. This arrangement was also necessary, in part, due to the increased gradient of the topography near the shoreline.

(1) Area twelve: Area twelve was developed around the nostalgically colorful Frankfort riverfront of the 17th and 18th century. This particular site is significant in that it was the location for the main riverboat landing which took passengers and freight to and from Frankfort.

The major attraction of the proposed landing would be an authentic paddle-wheel driven steamboat capable of housing a specialty restaurant and functioning as an excursion boat and museum. Along the shore a series of small shops were planned to re-

flect the early era of Frankfort as a major river trading post of the 17th century.

Parking and access to this facility is provided by an existing municipal parking lot. Access from the river was provided at each end of the main dock in order that boaters may stop and visit the facility.

The feasibility of the entire development is based, in part, upon the level of Frankfort's tourist trade and the potential of attracting more tourist trade. Frankfort already has a substantial number of attractions but the attraction of tourists is a highly competitive industry. In order to compete, Frankfort will have to develop a comprehensive improvement plan featuring its unique history.

(m) Area thirteen: Frankfort's central business district is literally backed up to the river's edge. Of the 1300 feet of riverfront between St. Clair and Capital Avenue, only 350-400 is visually accessible from within the shopping area. Further problems compound the future of the CBD riverfront. Plans have been drawn up to construct a street-width vehicular access between St. Clair and Ann Street. This action eliminates any chance to bring the shopper to the river's edge.

The purpose of this action was to provide circulation around the south-east corner of the CBD when the downtown pedestrian mall is constructed. This construction will close St. Clair St. between Wapping and Broadway and Main Street--one-half block east and west of the intersection of Main and St. Clair.

The only real potential for a unified riverfront development lies in the area east of the new Farmers Bank. The bank's departure from any previous architecture along main street may help to set the stage for future development.

The riverfront area east of Ann Street was planned to accommodate a series of small specialty shops and offices. The main access to these shops was provided by a common riverfront walkway. The extent of the walkway would reach from the bank building on Ann Street east to the Capital Avenue Bridge. At this point the walkway narrows and continues farther east to the site of the old lumber mill.

Unification of the central business district riverfront could be possible with the elimination of the proposed Wapping St.-Ann Street Connector. An alternative to this solution would have been to construct a sub-level street with entrances at the intersection of St. Clair and Wapping; and the intersections of Ann and Main Street. The results should provide the ground level use of the riverfront area for pedestrians, shops and a parking garage.

(n) Area fourteen: Area fourteen was once the site of a large lumber mill. It was here that the hardwood logs floated by river to Frankfort were sawn into lumber and shipped by steamboat to Louisville and various river ports for sale. This lumber was also used in Frankfort for the construction of steamboats, wagons and carriages.

The redevelopment of this site was planned around the re-

construction of an authentic lumber mill and museum which would portray this early and important part of Frankfort's riverfront history. Although the site is quite narrow and limited in buildable space there is adequate room to accommodate a building in excess of 10,000 square feet, adequate parking, and pedestrian circulation.

(o) Area fifteen: The scenic aspects of the Kentucky River Valley and the city of Frankfort can best be viewed from the Frankfort Cemetary Hill. The main entrance road of the cemetary parallels the brim of the hill top such that a major panoramic view of the river valley is possible.

It was here that an overlook, parking and interpretation center was planned. This facility can be accommodated without any changes in the existing road alignment, terrain; or infringement upon the main portion of the cemetary.

(p) Area sixteen: According to Frankfort's general plan, published in 1960, the riverfront area between Fourth Street and Todd Street had been designated for development of a neighborhood park. To date no action, as yet, has been taken towards the development of the proposed park.

The major function of this park would be to provide active and passive recreation as well as a means of access to the riverfront. Included in this study were plans for the development of creative play areas, picnic facilities, and pedestrian walkways.

Future plans for the addition of a major thoroughfare connecting Todd Street and Versailles Road may have some impact

upon the final details of the park. Preliminary studies show that a minor interchange at the intersection of Todd Street and Lawrenceburg Road would require a portion of the proposed park land. The change in the intensity and direction of traffic flow may also have a bearing upon pedestrian crossings.

(q) Area seventeen: Area seventeen was planned as a regional recreation park to serve Frankfort and Franklin County. The primary planning objectives were to provide an equitable balance of recreational activities with the carrying capacity of the land. The carrying capacity of any major recreation area is the ability of the land to withstand repeated use under normal maintenance.

One of the initial considerations for the park was the proposed 4-lane limited access Todd Street-Versailles Road Connector. The roadway was proposed as part of the Kentucky Department of Highways master plan for Frankfort's future urban transportation needs. The major benefits to be realized from this road construction will be the improved access between east and west Frankfort. The effect upon area sixteen in this study would be the 100% improvement in access.

The proposed alignment is based solely upon preliminary examination of the site conditions and the general plan as proposed by the Kentucky Department of Highways. Should the horizontal alignment be shifted in the final analysis, it would have little effect upon the land use and activities proposed for the park.

The land use for the park is divided into two general

categories; day-use and overnite. The day-use facilities are located at the northern and eastern portions of the site with the overnite camping facilities at the southern end. The camping area was planned with a controlled access in order that the non-camper does not inadvertently enter the area.

Access within the park is controlled by a two-way central loop road. Each activity area is located outside of the loop excepting the two baseball fields. The only major vehicular conflict on the site occurs at the grade crossing of the L&N railroad tracks.

Upon entering the site the first use area has been planned for picnicing. Due to the somewhat passive nature of picnicing it will not be in conflict with the highly active field sports area to the south. Integrated with the picnic area is a system of pedestrian ways and nature paths. This pathway system was planned to allow the visitor to penetrate the various activity and natural areas of the site.

The field sports, park offices, and recreation center were centrally located since they are facilities common to the entire park. The recreation center would also function as a headquarters for the local civic day camps for school age children.

The camping area complex was planned to accommodate at least 100 camping sites, a boat launching and parking area, and a range of recreation facilities for all ages. The layout of the camping sites is based on a combination of cul-de-sacs and loop

roads. The first three cul-de-sacs are planned so they can be closed off when a rise in the river elevation threatens to flood the lower camping sites. The flexibility of this plan also allows different segments to be closed off when major maintenance or repair is required.

Activity areas planned around the camping sites included swimming, court games, and a pitch and putt golf course. The small golf course was chose due to its adaptibility to the difficult terrain in this particular location.

The boat launching and parking area functions are in close proximity to the camping area. Many week-end campers can be expected to bring boats to the site. The launching and parking facility was planned to function only as a day-use facility. Boat slips were planned but there use would be intended only for the park visitors.

Immediately south-east of the camping area is the proposed location for Frankfort's new municipal water treatment plant. This facility will not directly affect the use of the immediate area since its operation is essentially noiseless and odorless. A 100 foot wide buffer area has been planned to visually screen the structure from the camping area.

East of the L&N Rail line, the topography of the site rises abruptly and terminates at a high vantage point some 280 feet above the Kentucky River. From this elevation the visitor has a commanding view of the Kentucky State Capital, the city of Frankfort and the river valley. It was here that an overlook

shelter and parking was planned.

Below the overlook is the location of the old hospital farm buildings. These buildings were planned for use in conjunction with a riding stable, a small agricultural museum and the park maintenance center. The primary concept of this area was to develop uses for the existing farm buildings that are expressive of the Kentucky rural farm life. The major focal point would be the horses which are a symbol of this blue-grass region of the state.

The extensive nature of this park may not be within the financial realm of the local civic club which has initiated plans for its development. It is recommended therefore, that the city of Frankfort and Franklin County pursue a joint effort toward its development. Both local governments would be eligible for federal matching funds including assistance on the part of the State Department of Parks.

4. Conclusion.

The future of Frankfort's urban riverfront lies in the community's recognition of the value and importance of its only major natural resource. Steps should be taken to arouse public interest and concern for the preservation and maintenance of critical areas along the riverfront in order that neglect and decay are not allowed to continue.

A joint city-county riverfront commission should be formed. Members of this commission should include government officials, members of local interest groups, and the general public.

The function of this commission would be to recommend policy and legislation necessary to the protection, maintenance and redevelopment of the urban and rural riverfront.

This commission should also be empowered to hire professional planning consultants to prepare a master plan to guide future riverfront development. This master plan should become an integral part of the city-county general plan and not a planning entity within itself.

The experience of this research and case study has shown that riverfront planning does not need to be perfected as a planning specialty. The only real approach to design is a complete awareness of the complex inter-relationships which exist between man, as the usurper of this resource, and the natural environment making up that resource. The study of these relationships is known more today by the term-Ecology.

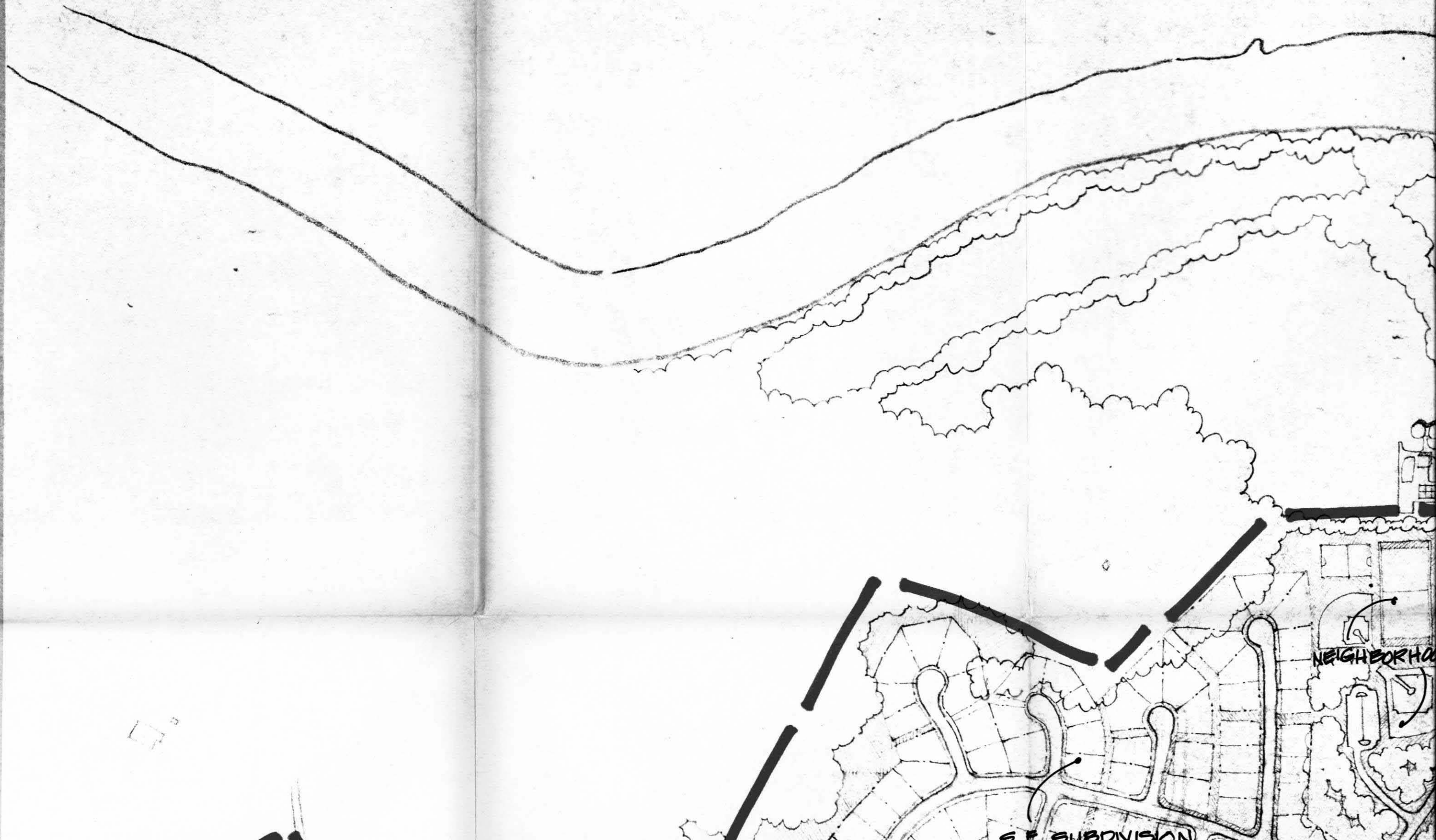
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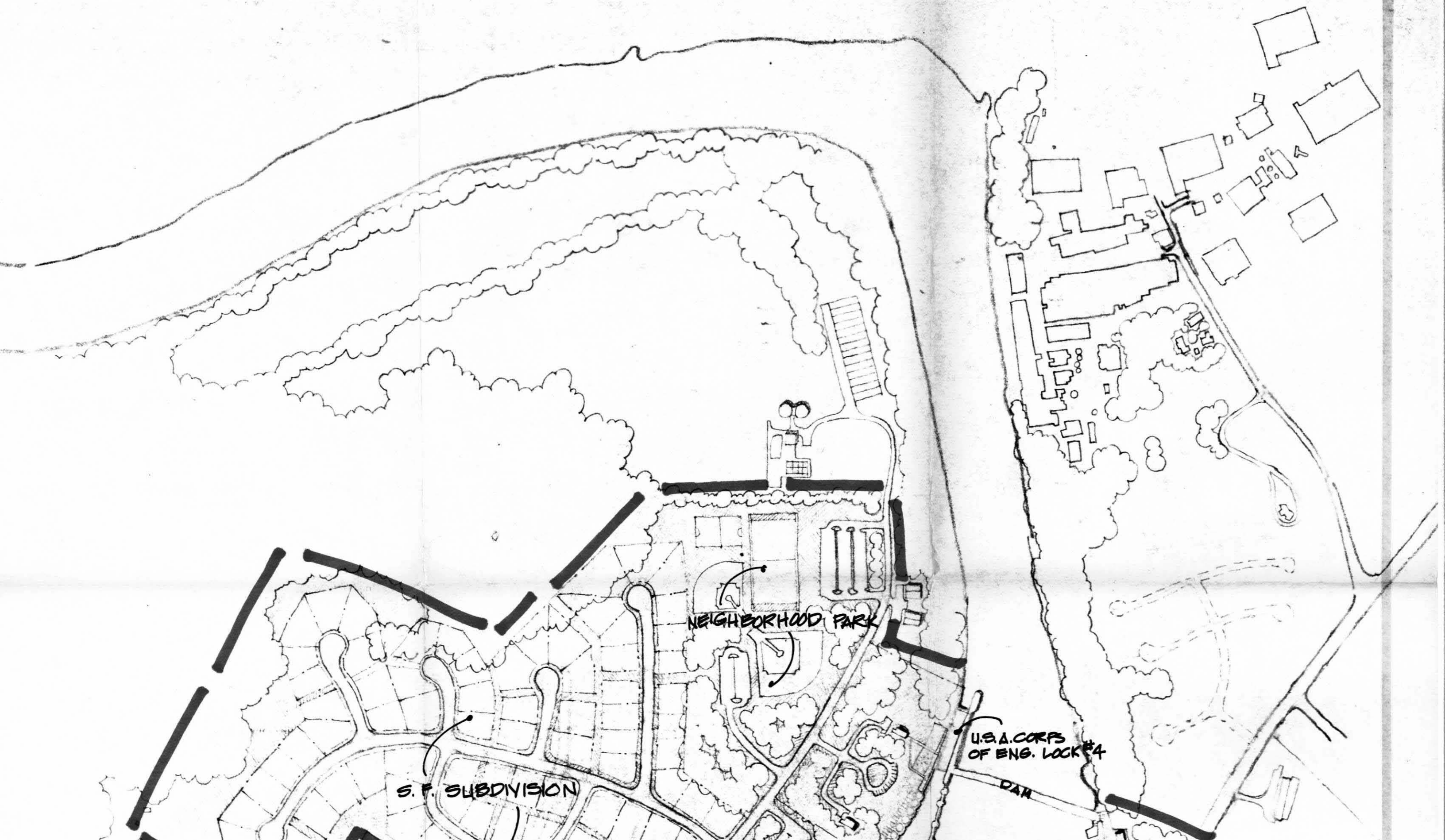
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SECTIONS.

THE FIRST IMAGE(S) IS OF THE LEGEND

THE FOLLOWING IMAGES WILL BE TAKEN
FROM LEFT TO RIGHT, TOP TO BOTTOM. SEE
EXAMPLE BELOW;

1	2	3
4	5	6
7	8	9



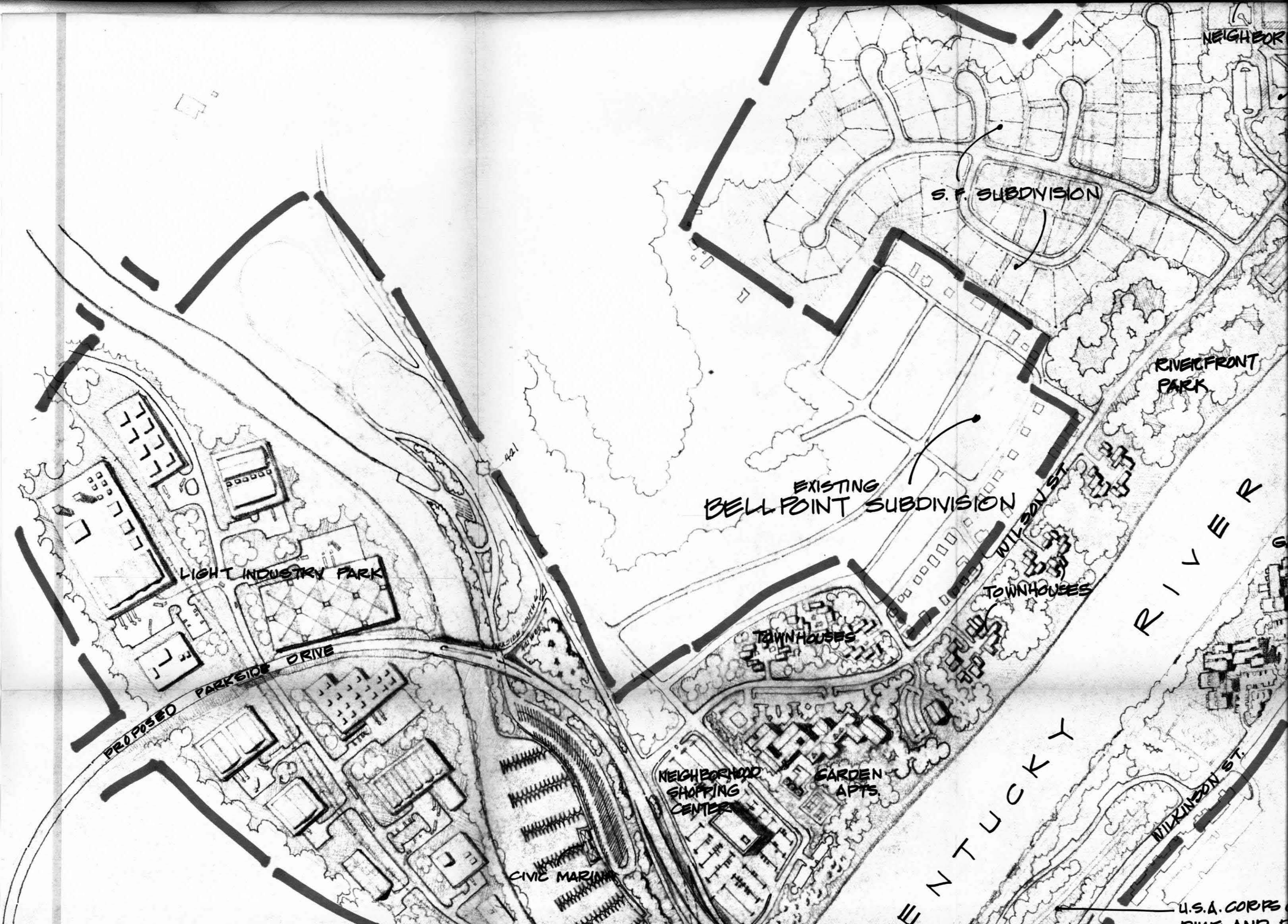


S.F. SUBDIVISION

NEIGHBORHOOD PARK

U.S.A. CORPS
OF ENG. LOCK #4

DAM



NEIGHBOR

S.F. SUBDIVISION

RIVERFRONT PARK

EXISTING BELL POINT SUBDIVISION

TOWNHOUSES

TOWNHOUSES

NEIGHBORHOOD SHOPPING CENTER

GARDEN APTS.

CIVIC MARINA

LIGHT INDUSTRY PARK

PROPOSED PARKSIDE DRIVE

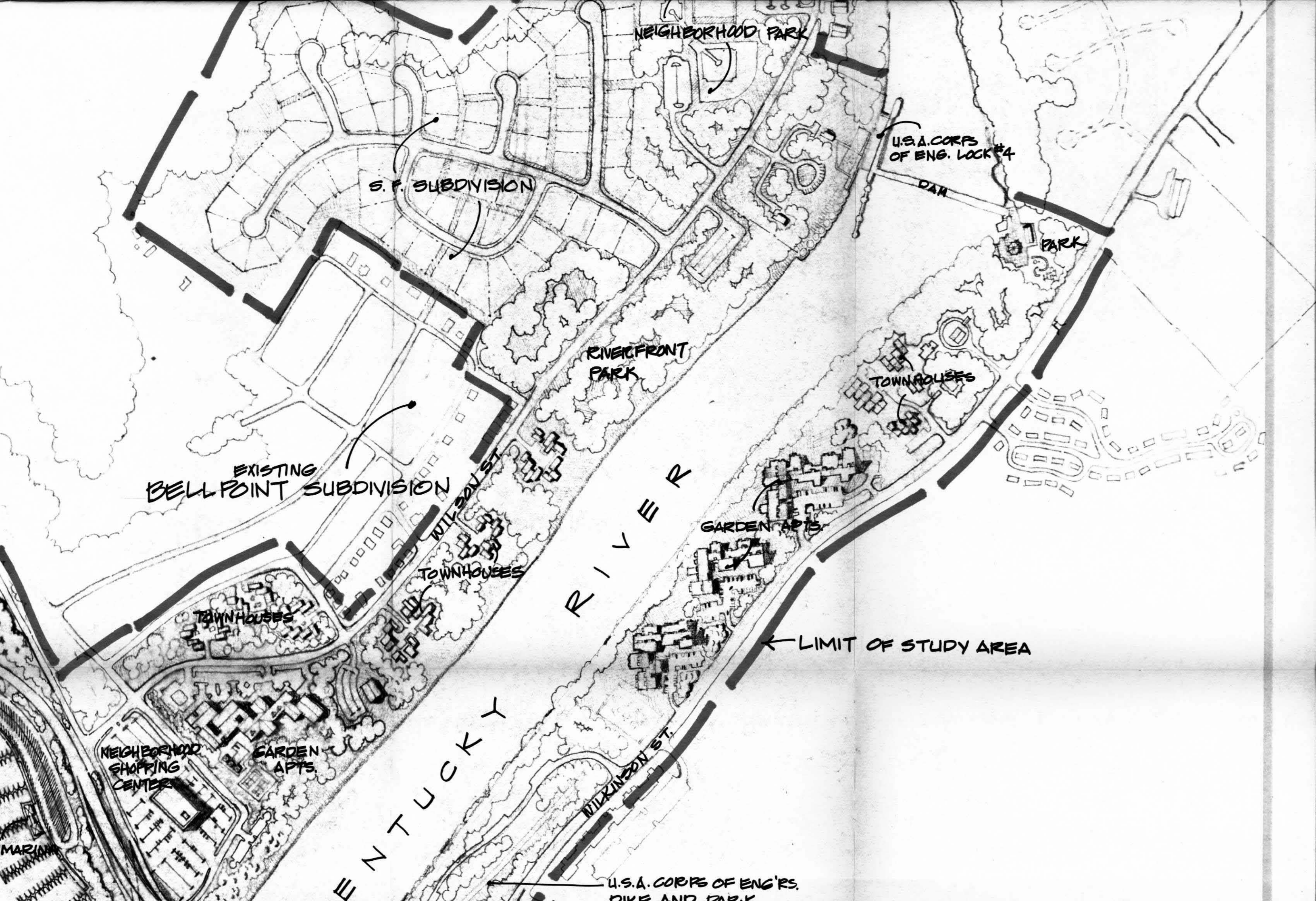
WILKINSON ST.

WILSON ST.

RIVER

ENTLUCKY

U.S.A. CORPS
ONE AND



NEIGHBORHOOD PARK

S.F. SUBDIVISION

U.S.A. CORPS
OF ENG. LOCK #4

DAM

PARK

RIVERFRONT
PARK

TOWNHOUSES

EXISTING
BELL POINT SUBDIVISION

TOWNHOUSES

GARDEN APTS.

← LIMIT OF STUDY AREA

NEIGHBORHOOD
SHOPPING
CENTER

GARDEN
APTS.

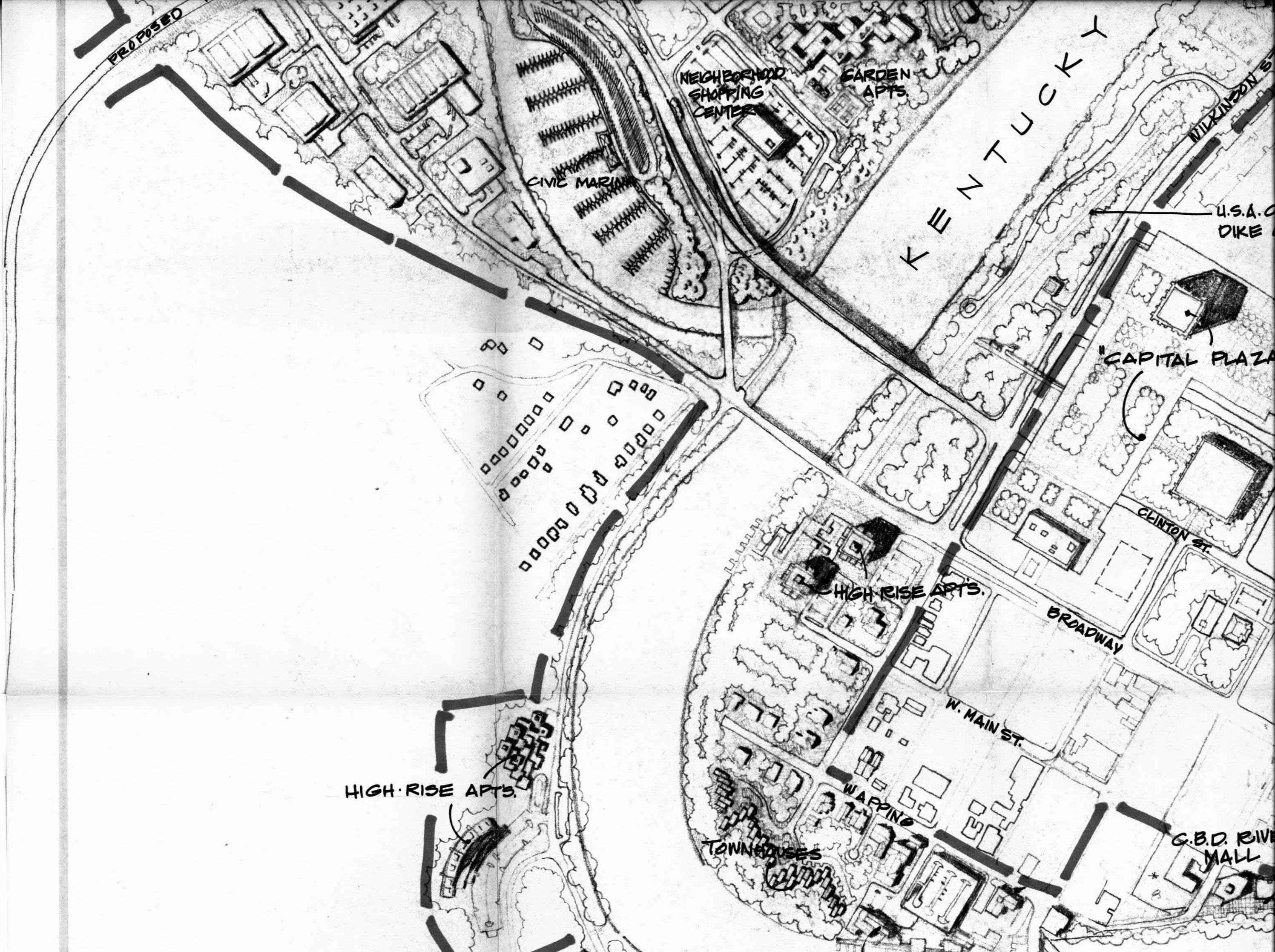
KENTUCKY

WILKINSON ST.

U.S.A. CORPS OF ENG.'S.
DIKE AND PARK

MARIAN

WILSON ST.



PROPOSED

NEIGHBORHOOD
SHOPPING
CENTER

GARDEN
APTS.

CIVIC MARINA

KENTUCKY

U.S.A. DIKE

"CAPITAL PLAZA"

HIGH RISE APTS.

HIGH RISE APTS.

TOWNHOUSES

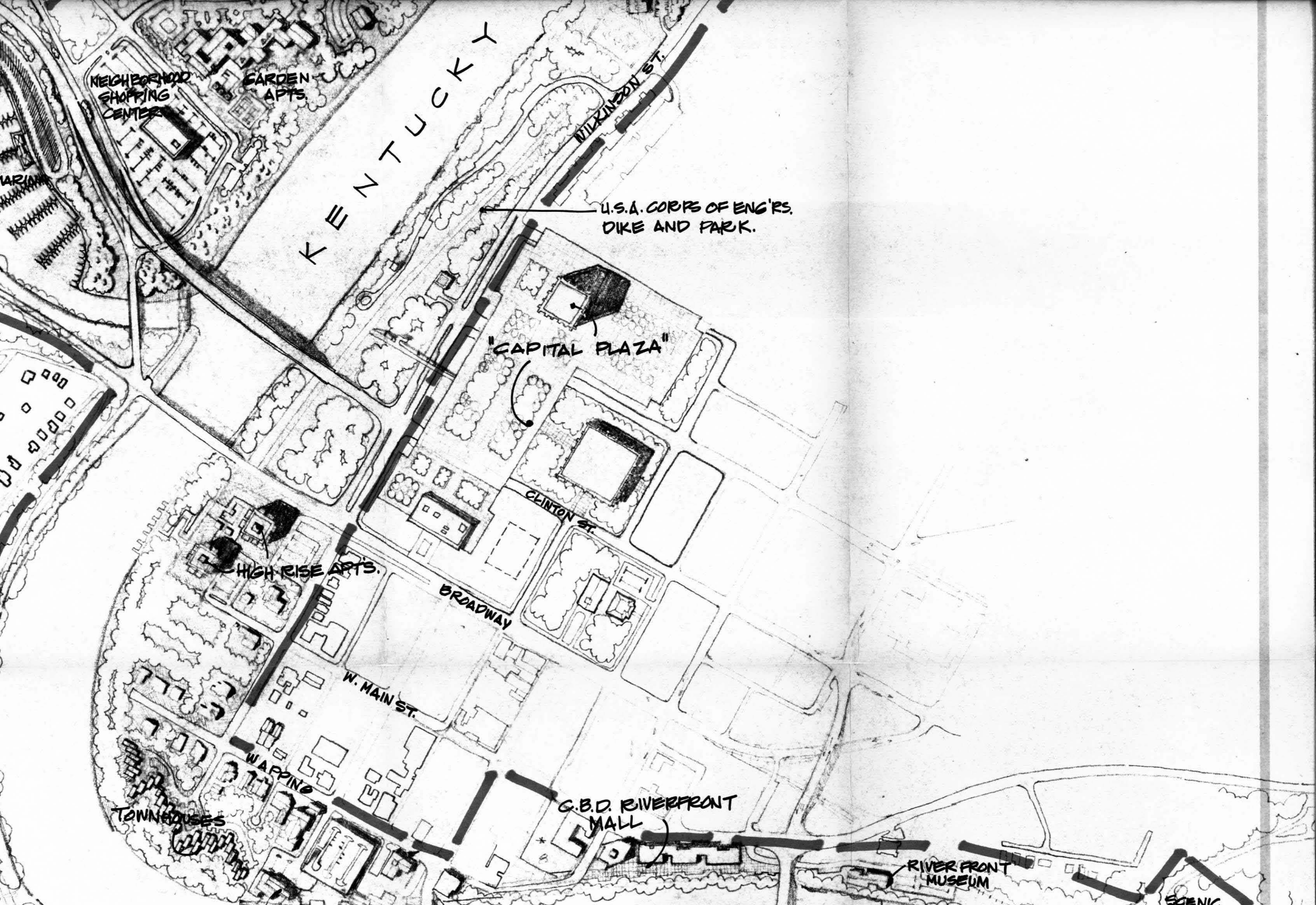
WAPPING

G.B.D. RIVER
MALL

BROADWAY

W. MAIN ST.

CLINTON ST.



NEIGHBORHOOD
SHOPPING
CENTER

GARDEN
APTS.

KENTUCKY

U.S.A. CORPS OF ENG'RS.
DIKE AND PARK.

"CAPITAL PLAZA"

HIGH RISE APTS.

CLINTON ST.

BROADWAY

W. MAIN ST.

WAPPING

TOWNHOUSES

G.B.D. RIVERFRONT
MALL

RIVER FRONT
MUSEUM

SCENIC

HIGH-RISE APTS.

HIGH-RISE APTS.

TOWNHOUSES

'OLD FRANKFORT
RIVERFRONT WARF'

SECOND STREET
SCHOOL PARK

SECOND STREET
COMMERCIAL DEV
SECOND ST.

G.B.D. RIVER
MALL



GENERAL DEVELOPMENT PLAN FOR THE
FRANKFORT, KENTUCKY URBAN RIVERFRONT

MATCH LINE

0000000

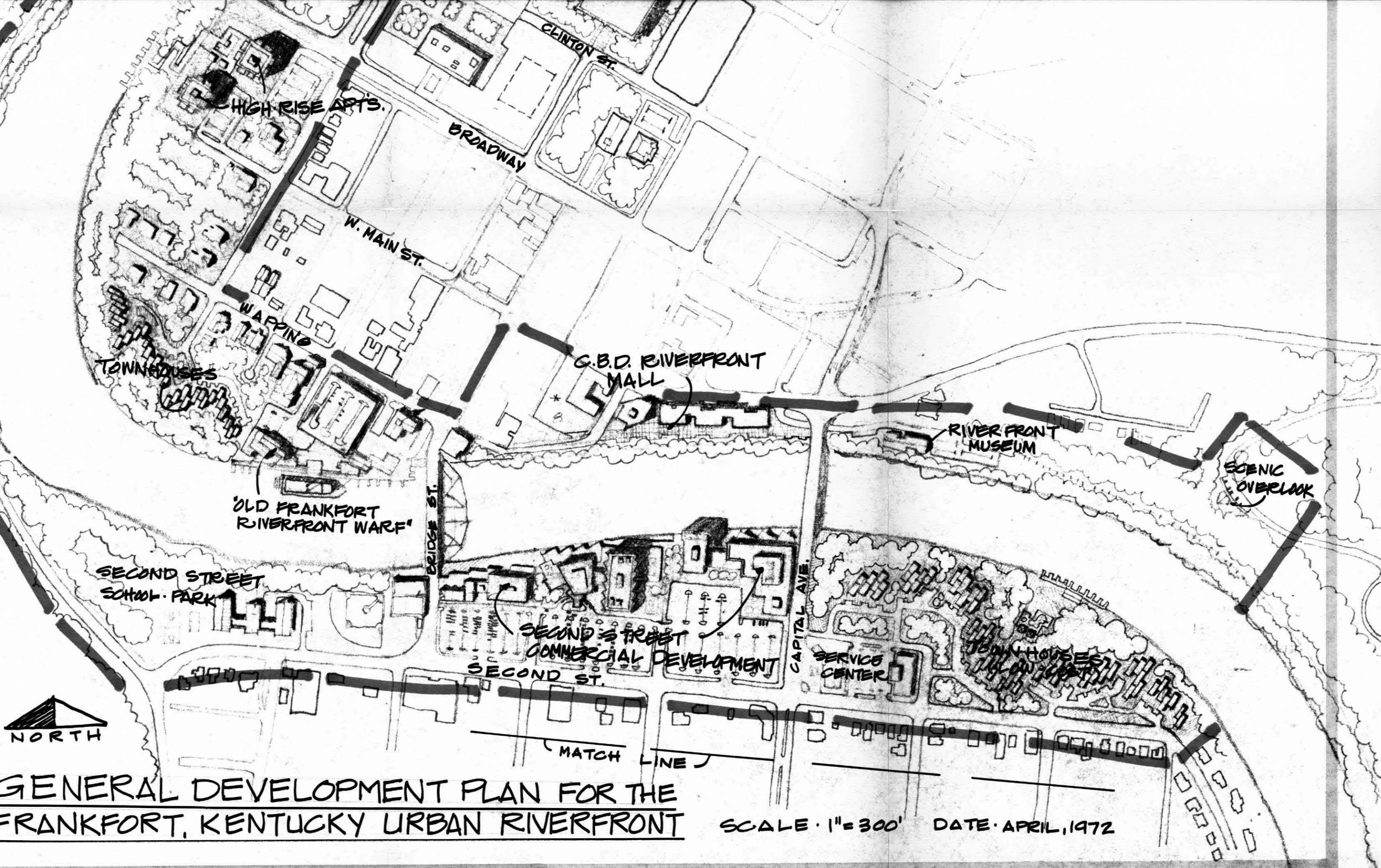
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BROADWAY

W. MAIN ST.

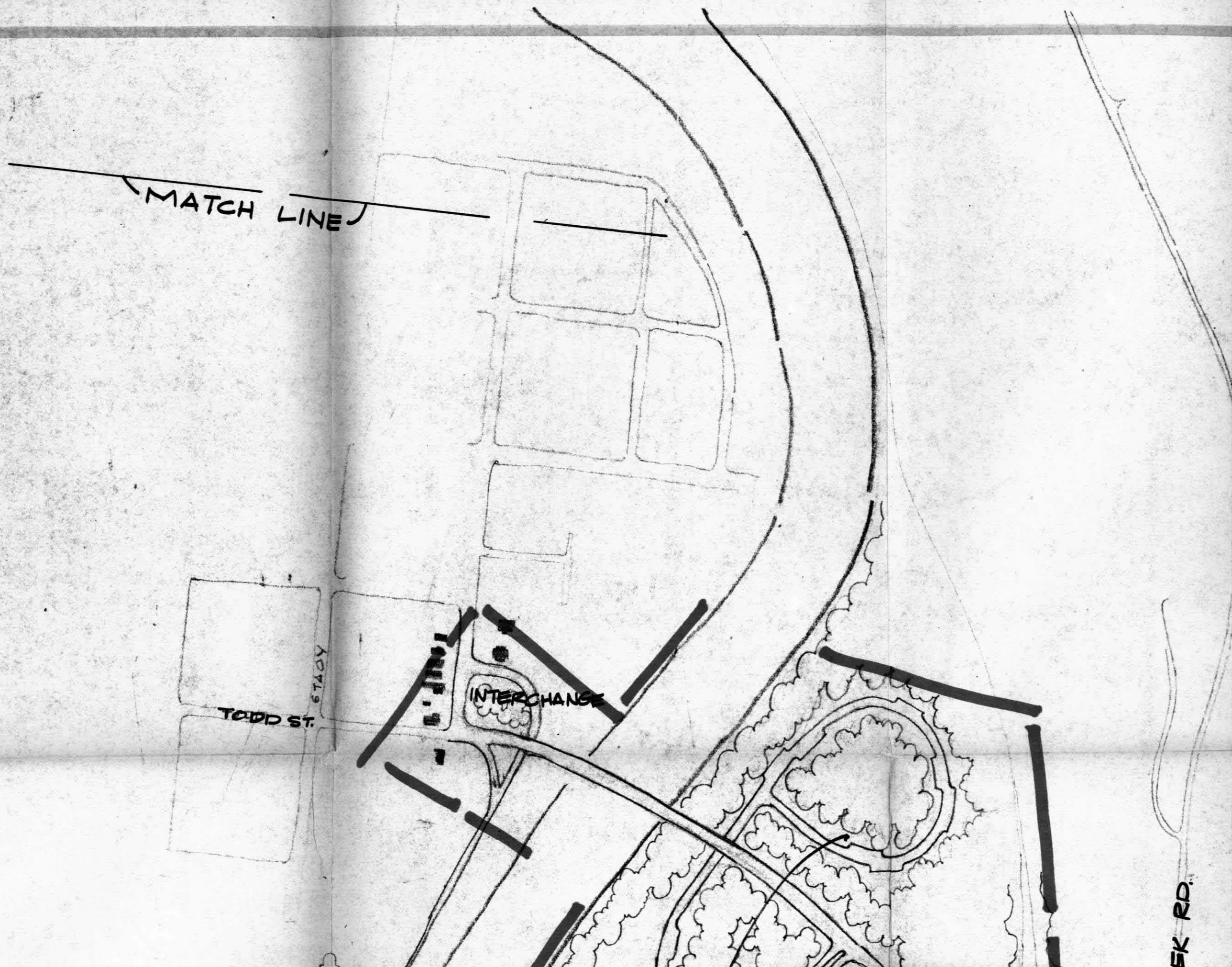
WAPPING

BRIDGE ST.



GENERAL DEVELOPMENT PLAN FOR THE
FRANKFORT, KENTUCKY URBAN RIVERFRONT

SCALE · 1" = 300' DATE · APRIL, 1972





CREEK RD.

CKY RIVER

PICNIC AREA

FIELD SPORTS
AREA

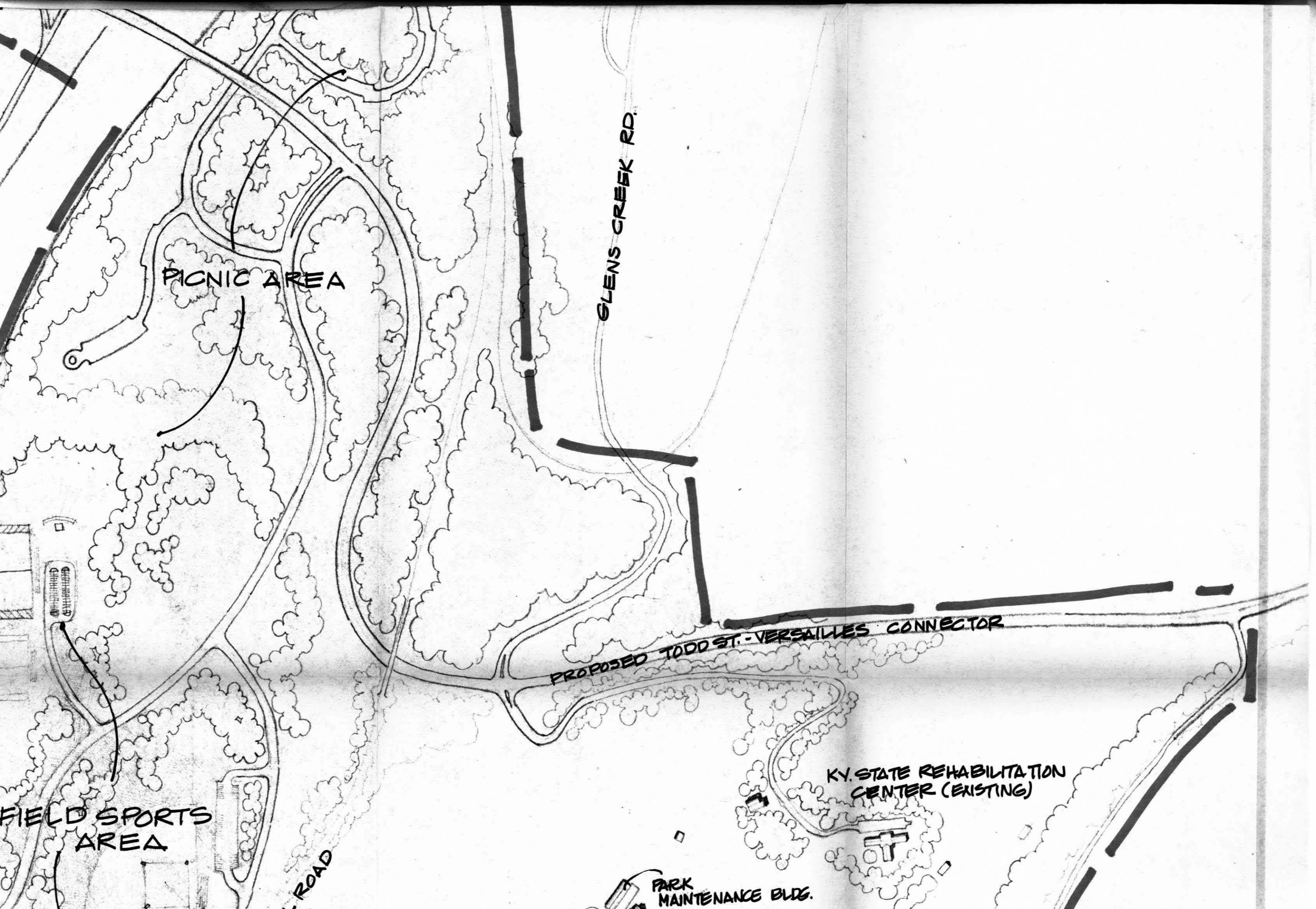
GLENS CREEK RD.

PROPOSED TODD

ROAD

PARK
MAINTENANCE





PICNIC AREA

GLENS CREEK RD.

PROPOSED TODD ST. - VERSAILLES CONNECTOR

FIELD SPORTS
AREA

ROAD

KY. STATE REHABILITATION
CENTER (EXISTING)

PARK
MAINTENANCE BLDG.

LAWRENCEBURG RD

KENTUCKY RIVER

FIELD SPORTS AREA

LEN RAIL ROAD

PARK OFFICES

BOAT PARK AND LAUNCH

COURT AREA

DOCKS

POOL

MINI-GOLF

CAMPING AREA

R. ROOMS

SHELTER

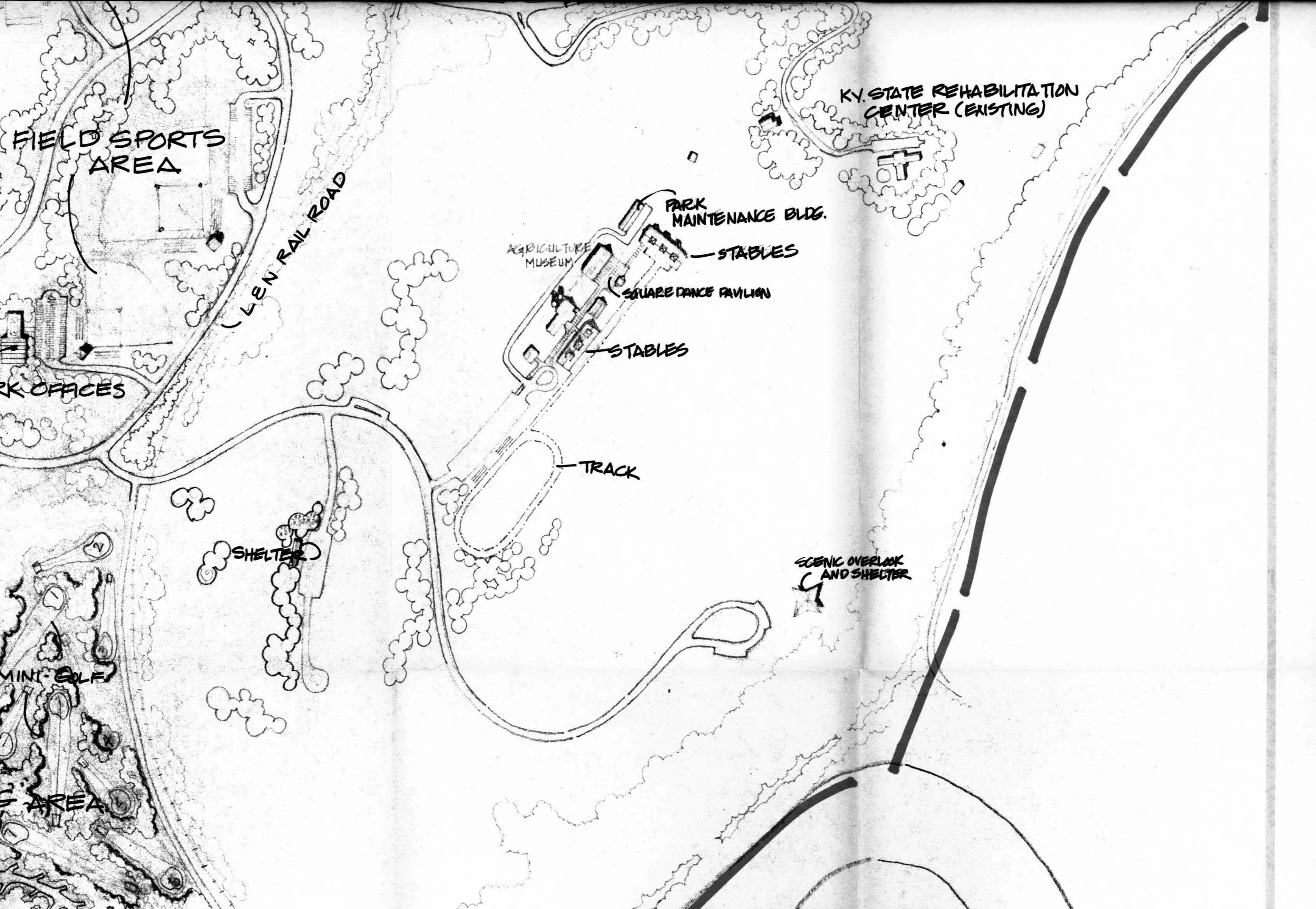
AGRICULTURE MUSEUM

PARK MAINTENANCE

SQUARE DANCE

STABLES

TRACK



FIELD SPORTS
AREA

LEN RAIL ROAD

PARK OFFICES

MINI-GOLF
AREA

SHELTER

AGRICULTURE
MUSEUM

PARK
MAINTENANCE BLDG.

STABLES

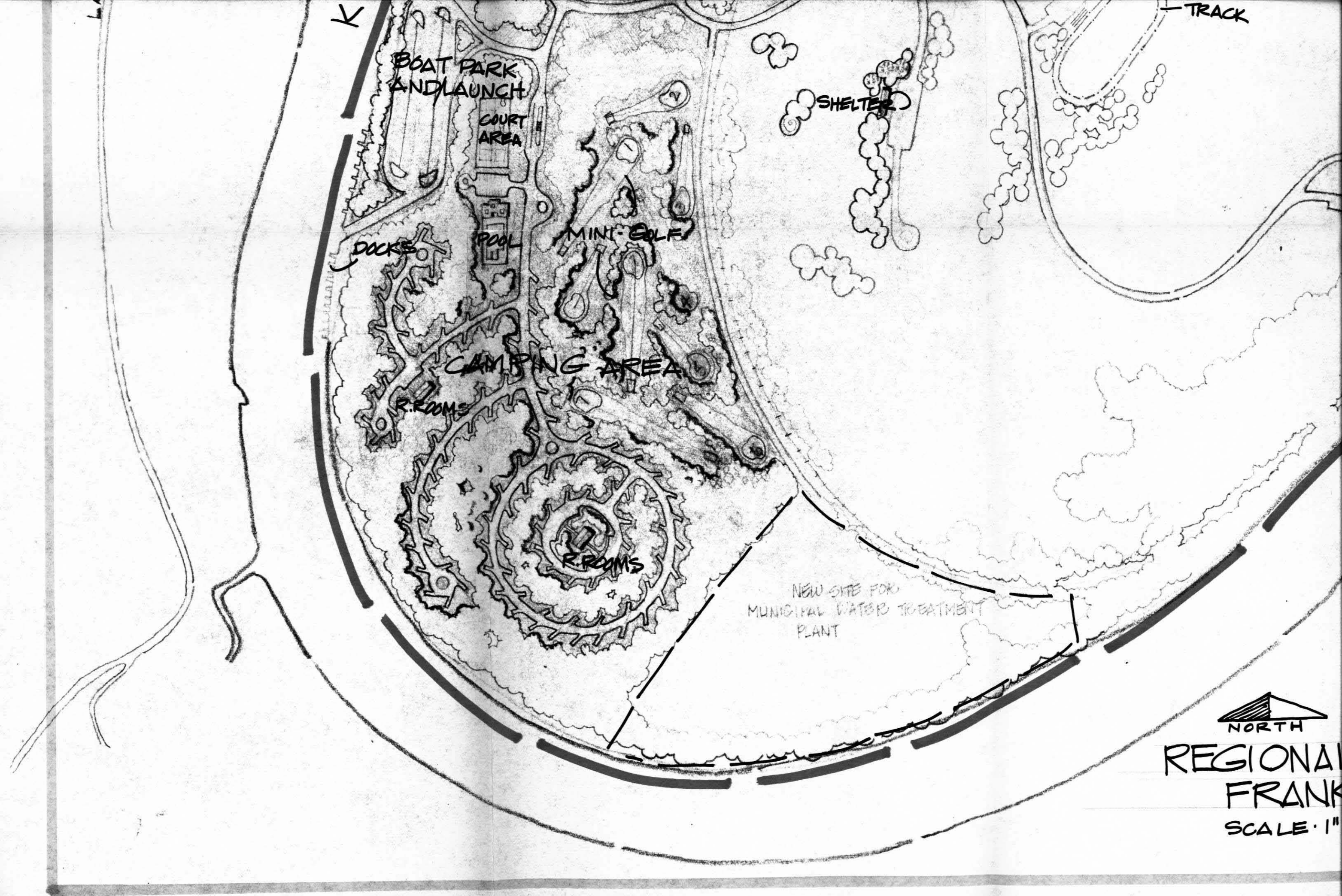
SQUARE DANCE PAVILION

STABLES

TRACK

SCENIC OVERLOOK
AND SHELTER

KY. STATE REHABILITATION
CENTER (EXISTING)



K

BOAT PARK
AND LAUNCH

COURT
AREA

DOCKS

POOL

MINI-GOLF

CAMPING AREA

R. ROOMS

R. ROOMS

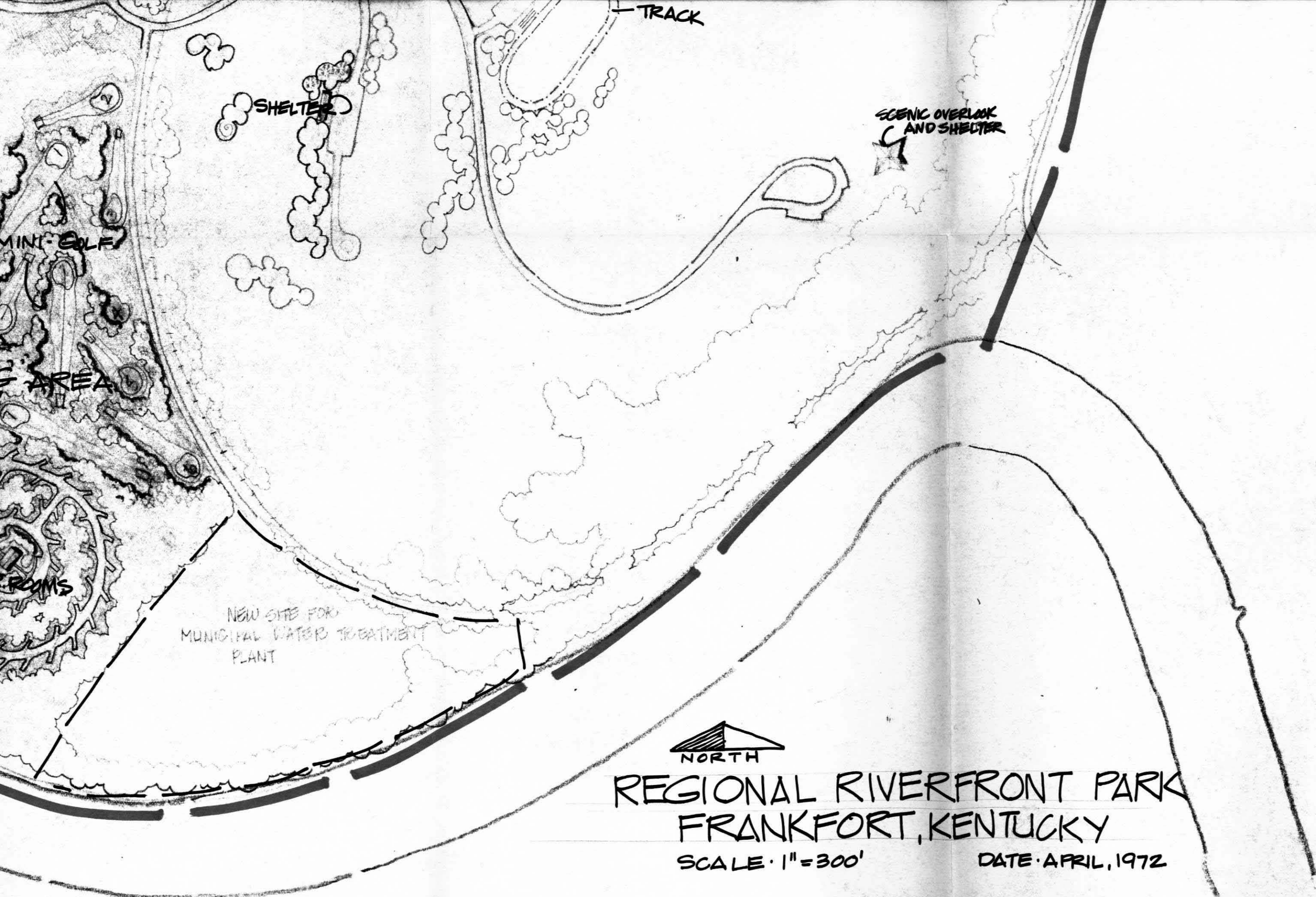
SHELTER

— TRACK

NEW SITE FOR
MUNICIPAL WATER TREATMENT
PLANT



NORTH
REGIONAL
FRANK
SCALE · 1"




NORTH
REGIONAL RIVERFRONT PARK
FRANKFORT, KENTUCKY
SCALE · 1" = 300'
DATE · APRIL, 1972

END

OF

OVERSIZE

DOCUMENT(S)

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APPENDIX A

Riverfront Standards and Controls (Recommended)
JAMES RIVER, Richmond, Virginia (Regulating the
Use of Properties in or Abutting the River and/or
River-Related Public Open Spaces)

1. Land Use Controls
2. Building Height and Bulk
3. Building Location
4. Bridges and Viaducts
5. Structures Within the River
6. Regulation of Water Flow
7. Preservation of Natural Features
8. Pedestrian Walkways
9. Treatment of River Edge
10. Limitations on River Recreational Use
11. Pollution and Litter

1. Land Use Controls

- a. No uses which produce noticeable odors, smoke, noise, undesirable light, or waste by-products, or which require the stockpiling of raw materials shall be permitted adjacent to river-related recreation areas.
- b. The plan layout and treatment of structures shall be such as to present an attractive facade facing the river.
- c. Billboards, project signs, parking areas, loading docks, storage areas and other service facilities shall be screened from the river and/or river-related public open spaces or riverside-canal pedestrian corridors.

2. Building Height and Bulk

- a. Building height, bulk and plan layout shall be such as to respect and preserve views of historic shrines, significant city landmarks and to accentuate and enhance noteworthy topographic features and to produce a desirable sequence of closed and open spaces along the river.

- b. Although some intermixing of urban uses may be permitted adjacent to the river, those sites with high aesthetic quality or potential shall be utilized primarily for residential purposes. Other uses which make most advantageous use of the resource or which serve cultural or leisure time purposes shall likewise be given preferential consideration.

3. Building Location

- a. All buildings abutting the river, canals, or other river-related public open spaces or separated therefrom by a public street or way shall be subject to approval by the City Planning Commission for general location and design characteristics.

4. Bridges and Viaducts

- a. Where necessary to maintain aesthetic harmony, existing river crossings shall be treated so as to blend with the landscape character of the river. When, due to economic or other reasons, modifications are not justified, consideration shall be given to removal or relocation of the structure.
- b. Future river crossings, whether public or private, must be approved by the City Planning Commission with respect to the effects upon the riverscape. Special attention shall be given to the point of connection between the bridge or viaduct and the land to permit uninterrupted circulation along the river.

5. Structures Within the River

- a. The retention of an existing building shall be permitted only if the following conditions exist:
 - (1) The building contributes positively to the riverscape or with relative ease can be made to do so from the standpoint of location and design quality.
 - (2) The building or structure is required to serve a bona fide public need such as sanitation or water supply, and an alternative solution is not reasonably feasible.
 - (3) It is essential to the serving of a recreational purpose.

- b. Future buildings or other structures may be permitted if they meet the following requirements:
 - (1) The building or structure serves primarily a recreational purpose.
 - (2) The location of the building is in conformity with a development plan adopted by the City Planning Commission.
 - (3) The exterior design character blends harmoniously with the surrounding landscape or can be considered to further a rhythmic sequence of continuity, accentuates nodes of activity within the recreation system, or heightens a desirable emotional impact (response).

6. Regulation of Water Flow

- a. No dam, lock, weir or other water control structure or device shall be permitted without there first having been determined that such construction will not adversely affect the aesthetic quality of the river and the proper functioning of the recreation facilities.
- b. Existing structures shall not be removed until the same determination has been made.
- c. Coordination with the U. S. Corps of Engineers, The Virginia Outdoor Recreation Commission and other federal, state and/or local public agencies shall be required.

7. Preservation of Natural Features

- a. Any building or portion thereof falling within the "Standard Project Flood Area" as determined by the Corps of Engineers shall require approval by The Department of Public Works and The City Planning Commission.
- b. Any uses or construction which would destroy the natural land forms or tree cover, which would alter the shoreline, or which would affect the appearance of the riverscape shall be subject to review and approval.
- c. Disturbance of natural features shall be limited to that necessary for the proper functioning and enhancement of buildings or structures and their sites,

erosion control, flood prevention, installation of utilities and service installations and the development of recreational and wildlife management facilities. When it is necessary to modify existing topography or in any way disturb natural features, special care shall be given to recreating a landscape character compatible with surrounding areas and uses.

- d. Landscape development, including the selection and use of plant materials, shall be considered in relation to fitness and contribution to the total landscape quality.

8. Pedestrian Walkways

- a. Within the property limits of all parcels abutting the river, canals, or river-related public open spaces there shall be provided a pedestrian walkway running generally parallel with the water's edge or open space boundary. Should the proper function of the permitted use preclude a shoreline or canal site alignment of the pedestrian walk, it shall be provided at an alternate and acceptable location.
- b. The walk shall be constructed of an acceptable material and section. It shall be well drained with a minimum width of 6' of pathway within a dedicated easement of 20' minimum width.
- c. Easement and walk construction shall be provided by the Owner on a reimbursible basis.

9. Treatment of River Edge

- a. In those instances where buildings and other structures are located immediately adjacent to water areas, the treatment of the water's edge shall be so planned as to reduce damage from high water, erosion, and normal riverbank and climatic attrition.
- b. Water edge improvements such as walls, piers, terraces, steps or rip-rap shall be used to create a variety of experiences as well as to serve necessary functional requirements.

10. Limitations on River Recreational Uses

- a. No recreational activity shall be permitted which will have a detrimental effect upon the private use and development of properties located along the river valley.

- b. The various recreational activities shall be located where the existing and proposed conditions are suitable and where necessary steps can be taken to provide a separation or effective buffer between incompatible uses.

11. Pollution and Litter

- a. No building, public utility or use of any kind shall be permitted within or in close proximity to the river if it empties pollutants into the air or water in such quantity as to adversely affect the usefulness of the river for recreational purposes or have a deleterious effect on its scenic qualities.
- b. All existing and future uses of land in or along the river shall provide litter-proof receptacles or enclosures to retain debris resulting from their operation.
- c. Current regulations with appropriate penalties enacted by the City or State in the interest of creating and maintaining optimum environmental conditions conducive to health, community appearance, and the proper utilization of natural resources shall be rigidly enforced. Additional regulations shall be adopted to supplement those already in effect to assure maximum effectiveness.

APPENDIX B

HISTORY OF THE SAN ANTONIO RIVER AND ITS DEVELOPMENTS

In January of 1964 voters in San Antonio, Texas, solidly approved a 30 million dollar municipal improvement bond issue. Approximately 1/3 million dollars of the bond offering is earmarked for municipal improvements to the downtown San Antonio River Bend. Approval of this feature, unprecedented for San Antonio, is a clear indication that property owners recognize the tremendous economic and esthetic potential of the city's most outstanding physical feature and are willing to pay tax monies to develop that potential. The "Concept Plan" and "Master Plan" were widely publicized in the months preceeding the bond offering and there can be little doubt that the plans were understood. Historically, however, San Antonians have not always taken such a keen interest in their river, nor have they looked upon its potential so favorably.

The first San Antonian, Franciscan Father Antonio De San Buenaventura Olivares, accompanied by three Indian guides, on May 1, 1718, came upon the clear, spring-fed, twisting river, and established the Mission San Antonio de Valero (now known as the Alamo), the first development of the city of San Antonio. The river naturally began to function for the settlement in the traditional dual role of watering place for men and animals and disposal carrier for waste and sewage.

As San Antonio grew, it was no exception to the typical, but incredible, pattern of growth of American towns which rigidly ignored their natural surroundings and developed a regular grid, block pattern without regard to contour or other landscape features. As a consequence, the San Antonio River received the backyards of houses and backs of buildings. There were a few exceptions to this general rule and at the turn of the century, some houses along King William Street boasted of large, landscaped rolling green lawns which terminated at the river with a summer house of carousel and in some instances, a private pier or boat dock. Such exceptions were indeed few, and higher densities and greater urban development simply resulted in more and more and taller buildings, which backed up to the river.

Periodically the river brought desolation. The picturesque mile-long horseshoe bend, in the downtown area, was responsible for many floods when torrential rains filled the banks and the sharp turns retarded water flow.

In 1919 a study was begun by the engineering firm of Metcalf and Eddy, which forecast that heavy flooding would result in serious damage to the city. In 1921, the river spilled over its banks taking some 50 lives and resulted in millions of dollars in property damage.

There was serious talk of covering the stream with concrete and making a street above, with the bed serving as a sewer. Fortunately, this did not occur. In its place a flood prevention program was launched. The Metcalf and Eddy report had recommended the eliminating of acute bends that had existed in the river. Two of these were filled in after new channels were cut, including a cutoff channel at the horseshoe bend.

As a result of a fight to save the horseshoe bend and its twist through the shopping district, the San Antonio Conservation Society was born on March 22, 1924.

The river was saved and the cutoff channel completed about 1929. A flood control program, including the building of Olmos Dam, was begun and subsequently, flood gates were built to cut the horseshoe bend of the river off from the main stream during floods.

In 1938, however, the full esthetic potential of the river in the town plan was recognized. Congressman Maury Maverick, Mayor C. K. Quinn, and a group of citizens headed by Jack White provided the leadership for what became the first real development of the river for the sake of the river only. Landscape Architect, Robert H. H. Hugman, was commissioned, as part of a WPA effort, to prepare designs for the development of the downtown meanderings of the river. Hugman's work with engineer Edwin P. Arneson as implemented by the WPA resulted in most of the improvements which can be seen today. The broad walks, the arched bridges, the steps at various entrances, were all accomplished during this time. Careful attention was given to the detailing of walks, steps, bridges, landings, and other structures such as the Governor's Palace on Military Plaza, the Alamo, and the early Texas buildings and houses which dotted the town plan.

With the exceptions of the opening of Casa Rio Restaurant in 1946 and Lung Jeu Restaurant in 1959, no significant business ventures and/or tourist attractions were established along the river walk until David Straus, president of the Straus-Frank Co., came up with an idea for developing the stream's potential. Dramatic steps to assure its programed improvement along systematic and orderly lines were taken. The San Antonio Chamber of Commerce set up a Tourist Attractions Committee and recommended a feasibility study on potential river renovation. The study was completed in 1961 by the Marco Engineering Co. of California, and suggested a year-round fiesta-type attraction.

Some of the leaders felt that the Marco plan lacked sensitivity to the real nature of the architectural heritage of San Antonio, and criticized the plan as being too carnival-like in its conception. After some debate, agreement was reached that the Marco plan should not be adopted in its entirety, but that it be used as a basis for further development action.

Subsequently in March, 1962, the City Council passed an ordinance which established a River Walk Commission consisting of seven members appointed by the City Council. The Commission was empowered to advise the director of the Department of Housing and Building Inspections concerning all applications for building permits within the River Bend area and to act in an advisory capacity to the City Council and the City Manager in all matters pertaining to municipal improvements in the River Bend area. This ordinance delegates to the River Walk Commission what actually amounts to practical zoning control. The Commission may "review proposed construction concerning appearance, color texture of materials, and architectural design of buildings whereby it is proposed to alter, modify, repair, or construct improvements, as well as install signs, or proposed lighting arrangements".

The first River Walk Commission joined with the Chamber of Commerce Tourist Attractions Committee and commissioned the San Antonio Chapter of the American Institute of Architects to prepare a master plan for the development. The San Antonio Chapter of the AIA in turn appointed a committee to do the work and with Architect Cy Wagner as Chairman, the committee began to energetically fulfill its directive.

The Paseo del Rio (Riverwalk) master plan study was carried out in the manner of a community comprehensive general plan. The committee members first prepared a base map of each lot and parcel of land which fell within the purview of the River Walk Commission Ordinance. A land use survey was made and an appropriate land use map prepared. A second base map showing the existing structures was prepared and a structural survey was made of every building.

Next, a photographic record was made of the river facade of every building, and a general feasibility study of the potential use of every building. The committee planners naturally found themselves immersed in the larger problems of the central business district, such as traffic, parking, and forecast of future development.

The firm of Callins & Wagner acted as the production group for the committee, with meetings held often to review and criticize progress of the planning work.

The master plan resulted in a land-use plan, a planning districts recommendation, a capital improvements program for development, both in the public as well as the private sector, and was presen-

ted in the form of drawings and text and a large model.

The plan established the overall objective of providing an open-space link for the three important spaces already existing in the central business district. The plan would implement this objective by joining at a pedestrian level, Alamo Plaza, the development known as La Villita, and Main Plaza, which is closely linked to Military Plaza, containing the City Hall and Spanish Governor's Palace.

The basic approach in developing the full potential of structures in the plan was one of zoning occupancy according to noise or activity level. A progression was established commensurate with the existing development of walks, structures, and landscaping, proceeding from loud to moderate to quiet zones, in a relationship which generates linking of like interests and a change of pace along the river walk.

Because of the importance of architectural rehabilitation to the realization of the plan, committee planners prepared construction feasibility studies for each block along the river walk. The sequence of sketches, drawn by Architect Cy Wagner, showed the results of these studies. The committee planners felt that stimulated by such studies, owners of the buildings along the river walk might be persuaded to launch their particular, individual rehabilitation effort. Also included was a set of recommendations for municipal improvements which would have to be accomplished by the City and which could only be financed through a municipal improvement bond issue.

Planners, turned salesmen, presented drawings, text and model to meeting after meeting of River Bend property owners, potential business tenants, civic leaders, garden clubs, any organized group which expressed a willingness to listen. Business activity began to stir.

In the public sector, the City Water Board built an elaborate and beautifully landscaped plaza in front of its building on Market Street creating a major entrance to the river. Across the river, the City of San Antonio constructed still another new entrance with an arched bridge across the river.

River property began to change hands and some new owners, as well as some whose property had been handed down for generations, commissioned architects to prepare preliminary designs for remodeling and rehabilitation.

Besides the River Walk Commission, two other distinct groups were organized to handle the various phases of river walk development. The Paseo del Rio Project Committee of the San Antonio Chamber of Commerce, composed of volunteer workers, concerned with helping

property owners find suitable tenants, and the Paseo del Rio Association, comprised of river walk property owners and business operators, banded together to promote their mutual interests. It is planned that this group will eventually take over all the responsibilities of the Chamber's Project Committee.

As mentioned earlier, the City of San Antonio has committed over \$300,000 for river walk improvements, some of which have already become a reality. These include extension of the river walk, installation of dramatic and aesthetic lighting along the walk, new entranceways, and a marina for the party barges, river taxis, pedal boats as well as the maintenance and work boats of the City Parks and Recreation Department.

Other portions of the river are in the planning stages for beautification under the San Antonio River Authority.

A 2 1/2 mile stretch, from the White Avenue Bridge to the Espada Park and Dam, has been approved for a Neighborhood Youth Corps Program. Some 100 youths will be employed for six months to plant trees, resod or plant new grass, renovate the old San Juan Dam and clear a ditch in that area and develop Espada Park under the anti-poverty campaign. The river channel in this area was improved by the corps of engineers some two years ago in a flood prevention and control project and the River Authority is seeking to turn the historic site into a tourist attraction.

The River Authority also plans construction of a stone channel from the downstream side of the San Juan Dam (also constructed by early Spanish Padres) for 1,000 feet to retain the small flow of water over the dam in a picturesque channel.

Each year, San Antonio plays host to several million visitors from all over the world. "Something to do" must be provided for these visitors if San Antonio is to take its rightful place in a tremendously competitive field. Complete development of Paseo del Rio San Antonio will provide this "something" which no other city in the nation can match.

CURRENTLY, THESE PLACES OF BUSINESS ARE OPEN ON THE RIVER WALK:

THE LANDING - A Dixieland Jazz night club that features Jim Cul-lum's Happy Jazz Band and an audience sign-along.

EL POCO LOCO - A picturesque south-of-the-border night club decorated in the pastel pinks, blues and greens of Mexico that serves up the brass, marimba and flute sounds of Ramiro Cervera's Poco Loco Brass.

THE BILLBOARD THEATRE - A repertoire theatre in the round offering the best San Antonio has in live drama.

LA PALOMA DEL RIO - Excellent Mexican cuisine in one of the river walk's finest Mexican Colonial restorations. Dining indoors or on the balcony overlooking the river.

VENICE ITALIAN RESTAURANT - The atmosphere of Bella Italia on the river walk. Eat pizza, Lasagna, raviola and other authentic Italian dishes on the river side patio under 200 year old cypress trees or inside in the air conditioned dining room.

CASA RIO MEXICAN RESTAURANT - The dean of the river walk, established in 1946. Mexican menu and steaks served indoors or on the river patio.

LA SIRENA - The finest of crafts of Old Mexico including a magnificent art gallery.

THREE WIVES ANTIQUE SHOP - Fascinating and unusual selections of antiques and relics of Texas' colonial period.

HEINE'S STEAK AND STEIN - A steak house and beer garden of the first order located in a recently renovated building that stood during the Battle of The Alamo. Dining on three levels and on the river side patio.

EL TROPICANO MOTOR HOTEL - San Antonio's newest downtown hotel.

All restaurants serve special dinners on the party barges that ply the river. Pedal boats and river taxis are in constant use.

COMING UP:

Twelve buildings are now under renovation. They will make available space for at least 30 more establishments. The cost of private capital renovation alone (not counting land acquisition) for these properties is in excess of \$2 1/2 million. Nearly all of these projects are scheduled to be finished and occupied by April, 1968 when HemisFair, San Antonio's worlds fair opens.

AN APPROACH TO URBAN RIVERFRONT REDEVELOPMENT
A CASE STUDY ON THE KENTUCKY RIVER
FOR FRANKFORT, KENTUCKY

by

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Many cities across the United States which were originally founded along a major river or stream owe much of their growth and development to the resources derived from these natural water courses. In the earliest stages of development, these cities utilized the river as a means of navigation, a source of energy for their grain mills, a source of food and water, and a place to cleanse themselves.

At the turn of the century, the industrial revolution spurred new growth and development. The river was used to haul tons of coal and iron ore, to power generators for electricity, and as a place to discharge industrial wastes and sewage.

The riverfront was often the "front door" of the community before the age of the automobile and roadways. This was the center of the city's commerce, and people and trade goods arrived and departed from paddle wheel steam boats.

Now, the life and uses once found on the riverfront have changed. Decay and blight have set in causing the community to turn its back and literally ignore the riverfront's existence. Many of the rivers are now so polluted that they cannot sustain plant or animal life.

In the last five years the public has shown a growing awareness of the environment, and its problems, and they understand the great need for cleaning up our rivers and riverfronts. New ideas and concepts for redevelopment of our urban riverfronts have begun to develop as a result of recent studies.

The major emphasis of this study was to develop a planning

approach to solving urban riverfront problems. This was accomplished by analyzing available studies of various cities across the nation in order to determine the best approach. The results were then applied to an actual situation. The primary difference in this type of urban study as compared to most urban studies was the problem of contending with a natural resource not found in the majority of urban situations.

In brief, the approach to urban riverfront development, which evolved from this study, lies in the analysis of the following factors:

- A. The natural environment and its effect on the urban area;
- B. The urban area and its effect on the natural stream environment;
- C. Producing the best possible balance between use and conservation.

After limitations of the natural environment and the needs in the urban area are analyzed, the physical planning process may begin.

The area chosen to apply the planning approach was the city of Frankfort, Kentucky, capital of the Commonwealth of Kentucky. Frankfort is located in the north central part of the state between the cities of Louisville and Lexington. The river which flows through Frankfort is the Kentucky River. The Kentucky River is navigable in its entirety by means of 14 locks and dams which provide 260 miles of water access.

From the time of Frankfort's founding in 1786, it has always made use of the river either for commercial or recreational purposes. The existence of these two uses, along with the conditions of the water, adjacent land and structures, made the riverfront site an ideal study area.

The results of the planning study brought out the following items:

- A. The growing demand for recreational use of the river has surpassed the available facilities to serve the needs.
- B. There still remains a sufficient amount of riverfront land within and adjacent to the urban area which is adaptable to recreational purposes.
- C. The Capital Plaza, a significant urban renewal project adjacent to the downtown riverfront, has created new community interests and awareness of the conditions which still exist along the shoreline.
- D. The physical condition of the water and adjacent land are such that they have the potential to accommodate a full range of riverfront uses to meet the community's needs.