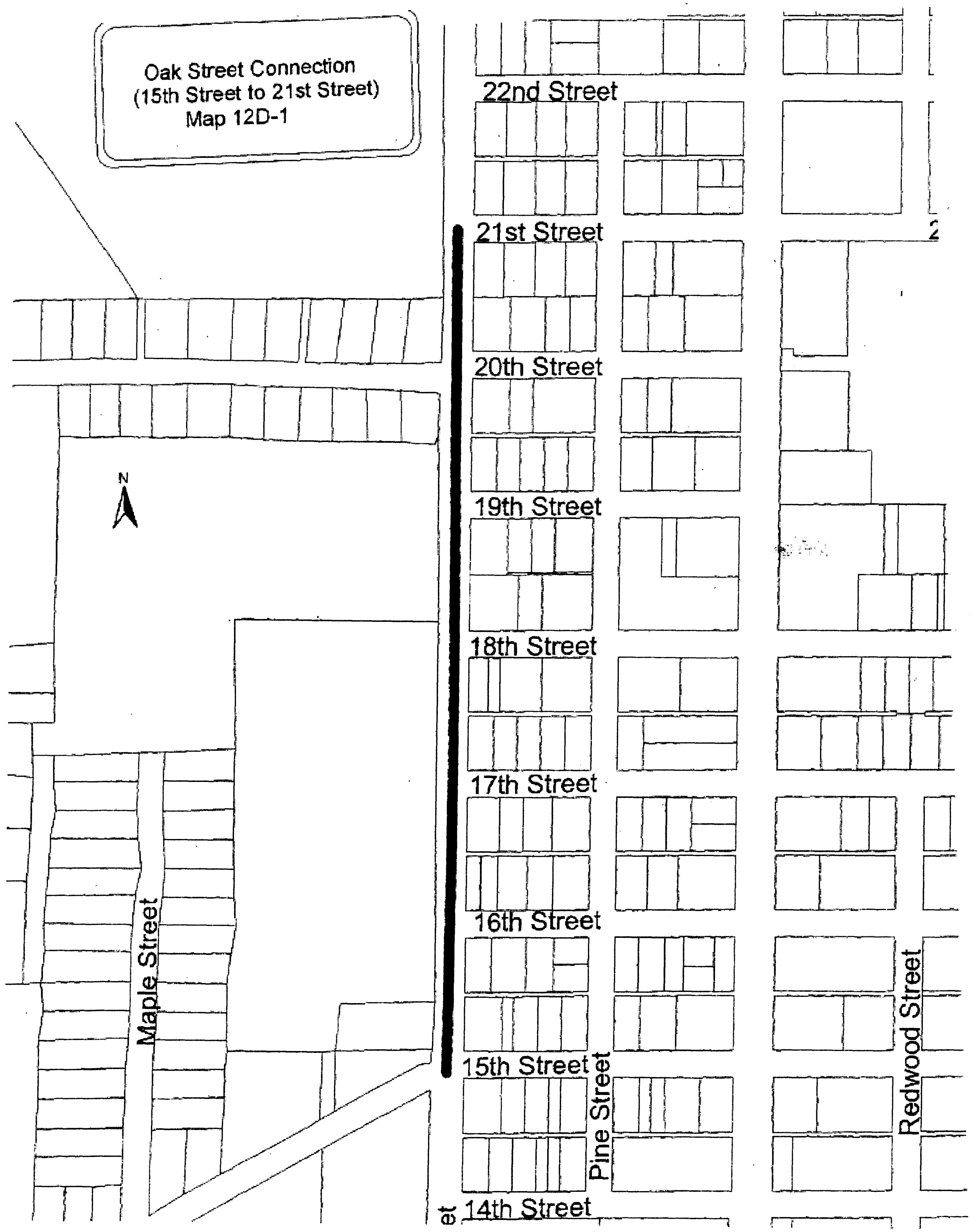
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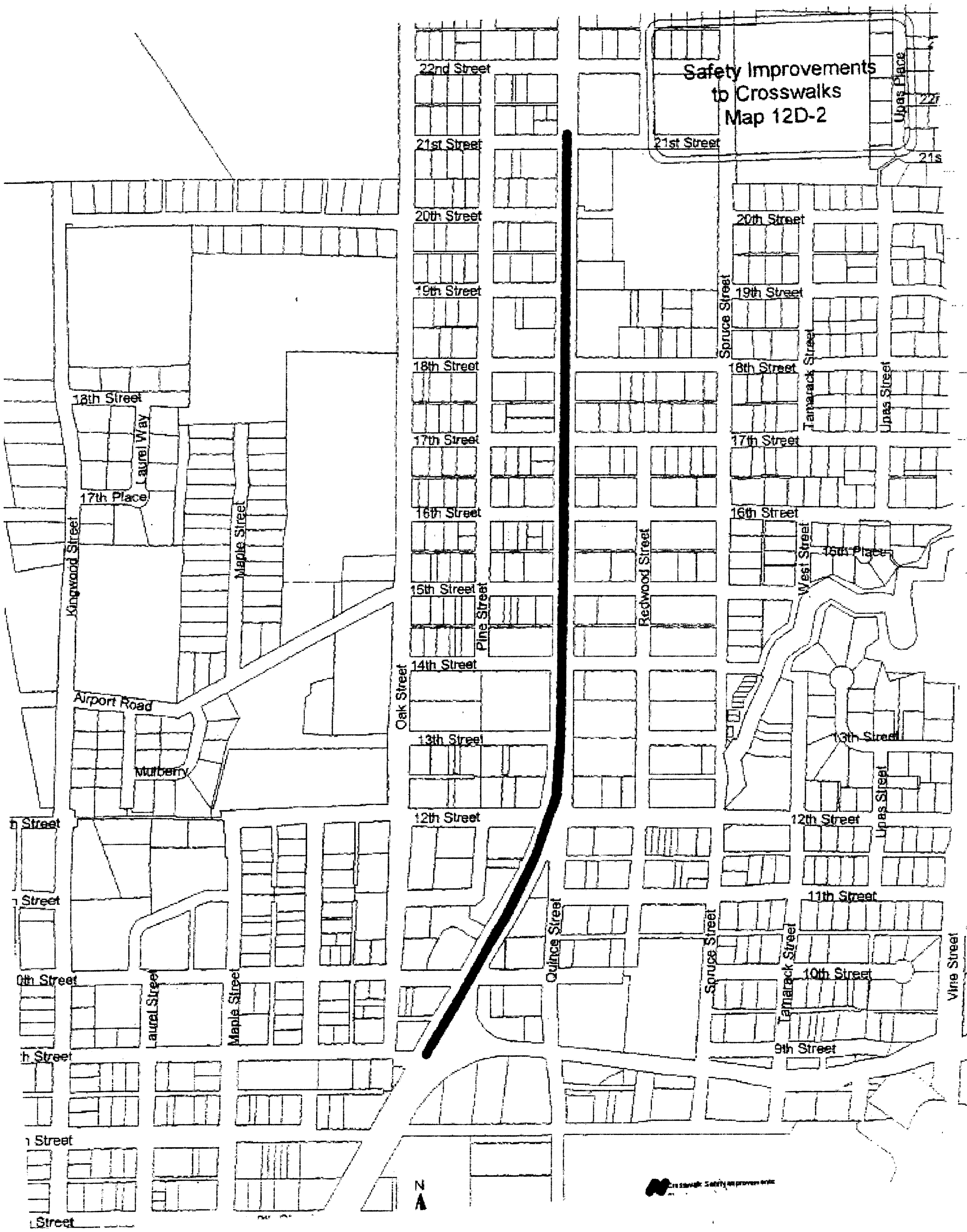
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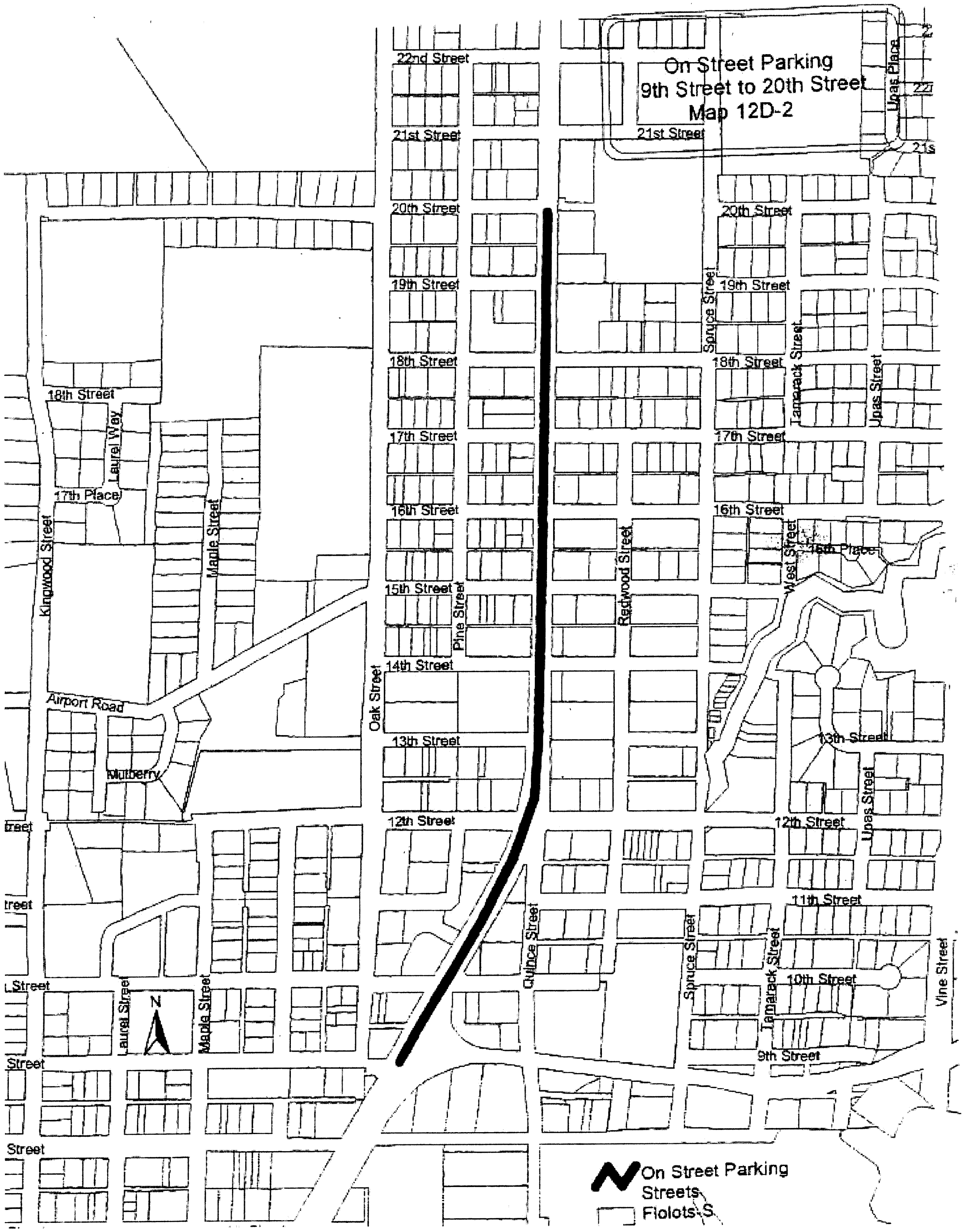
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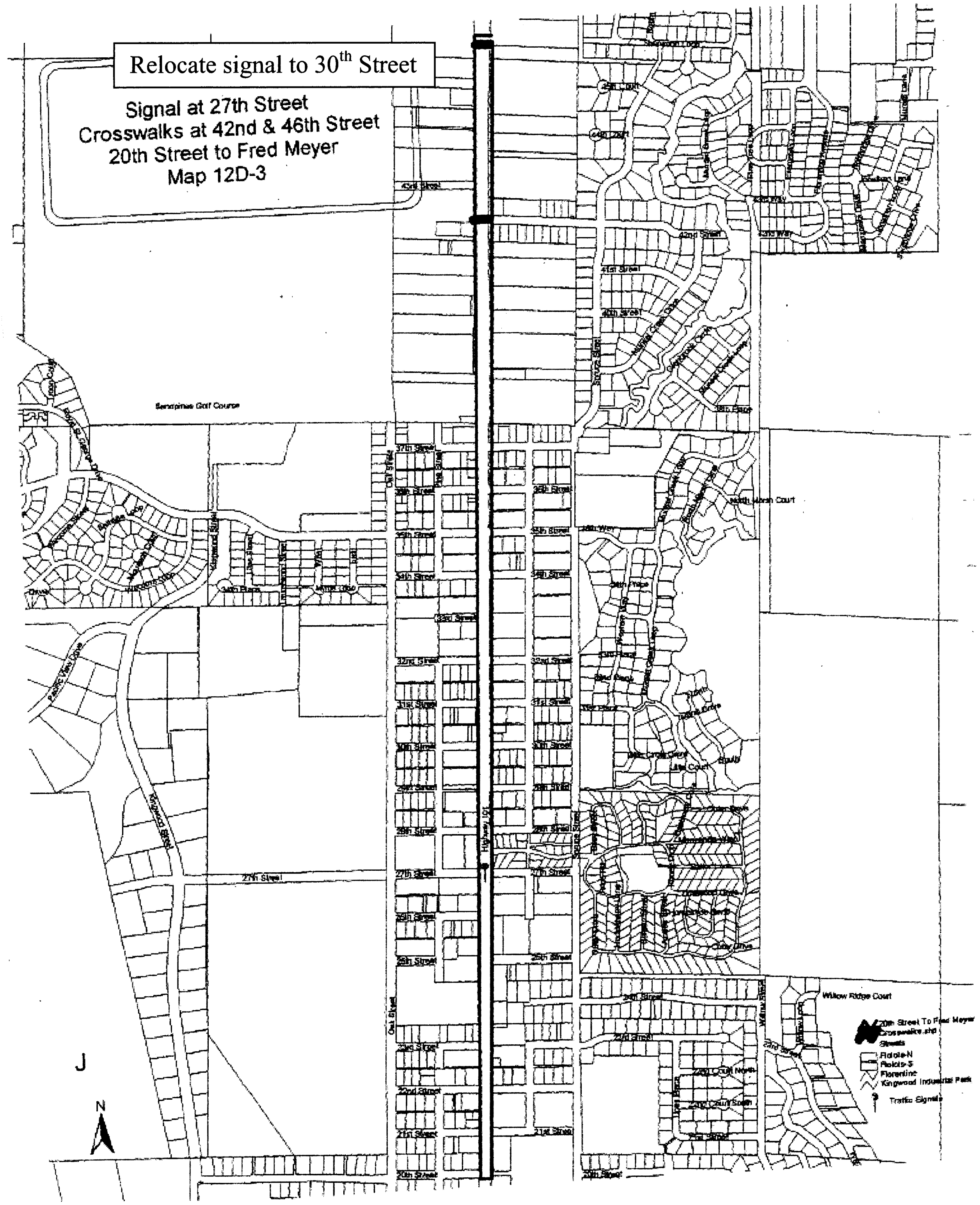

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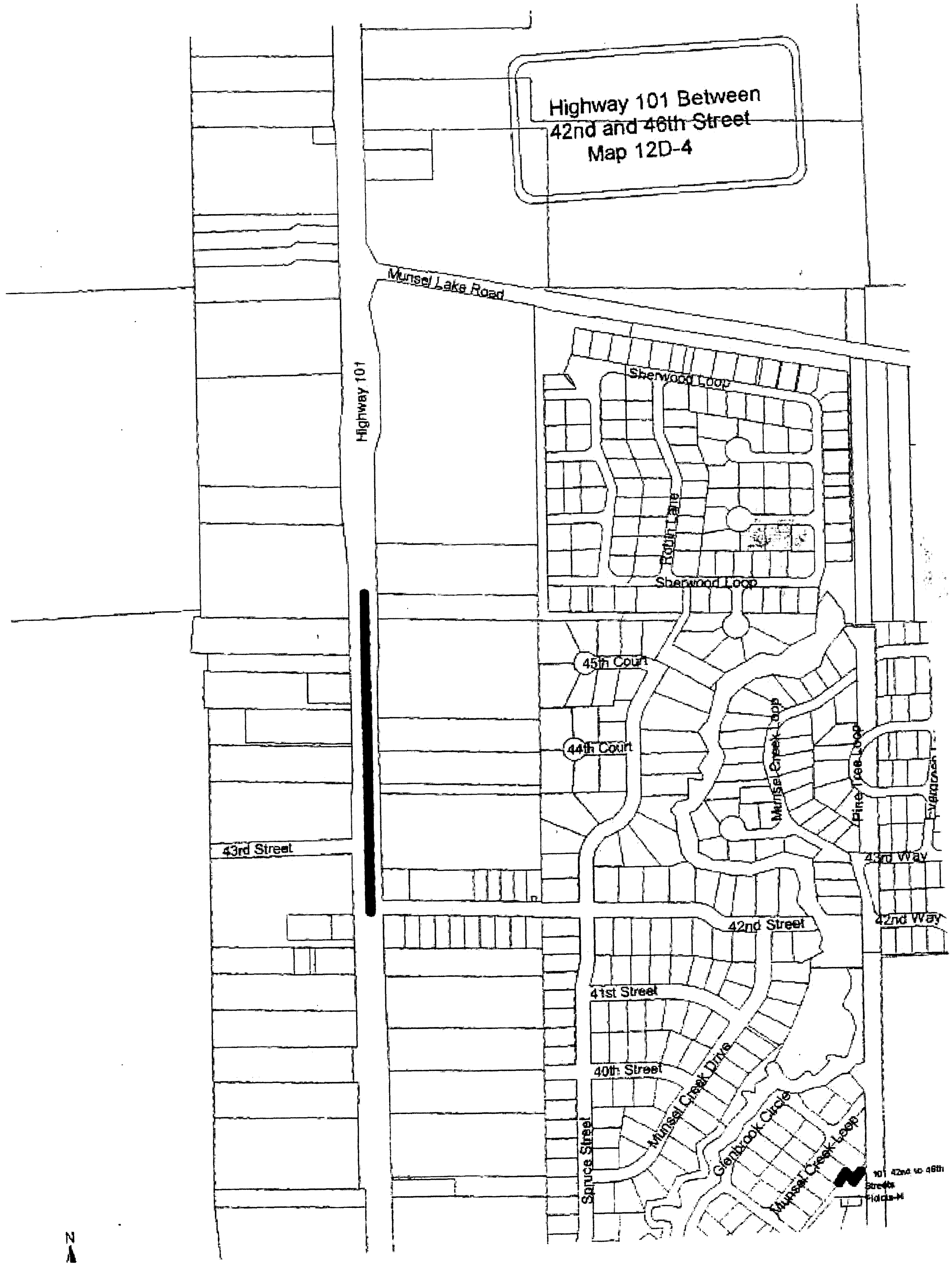
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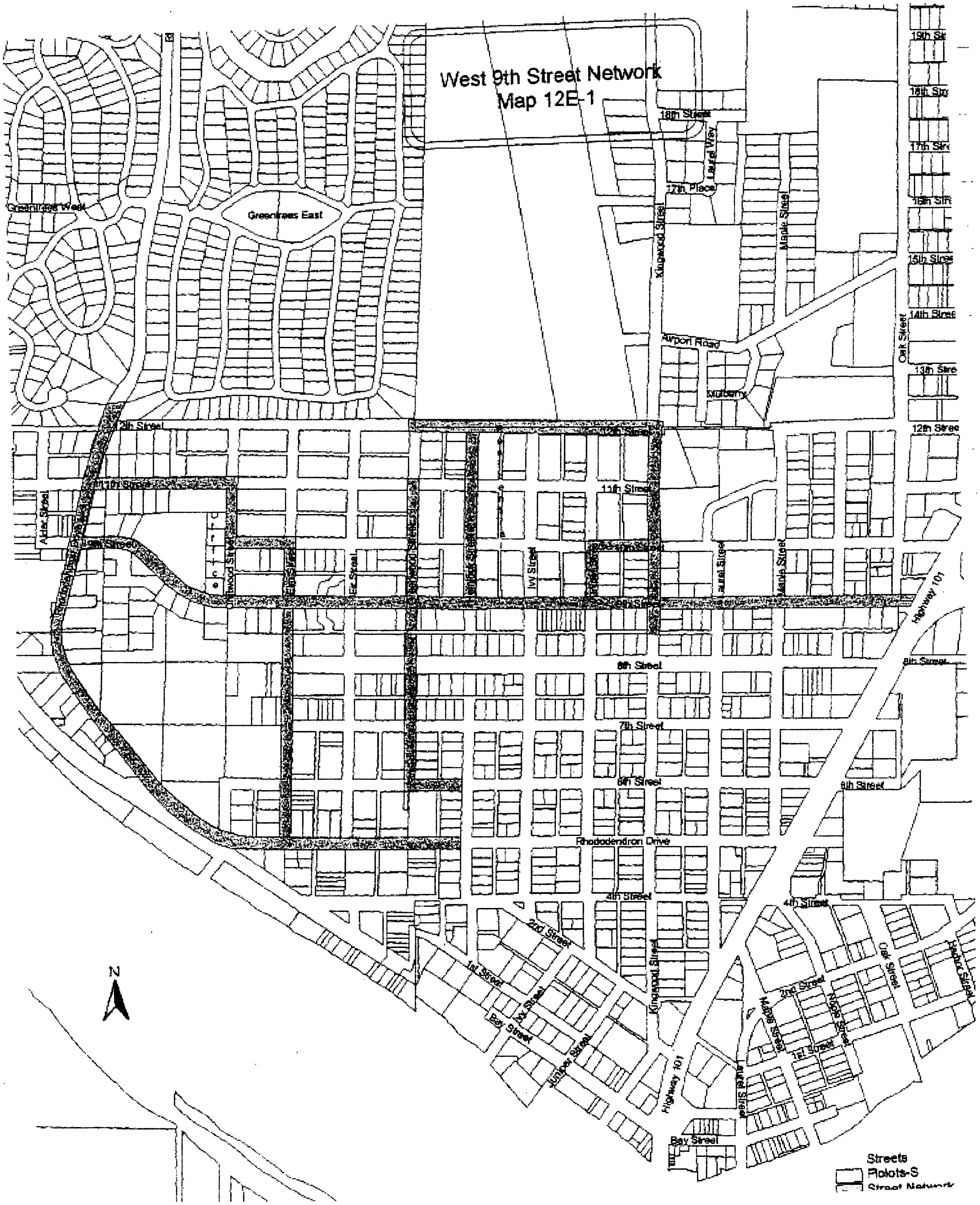
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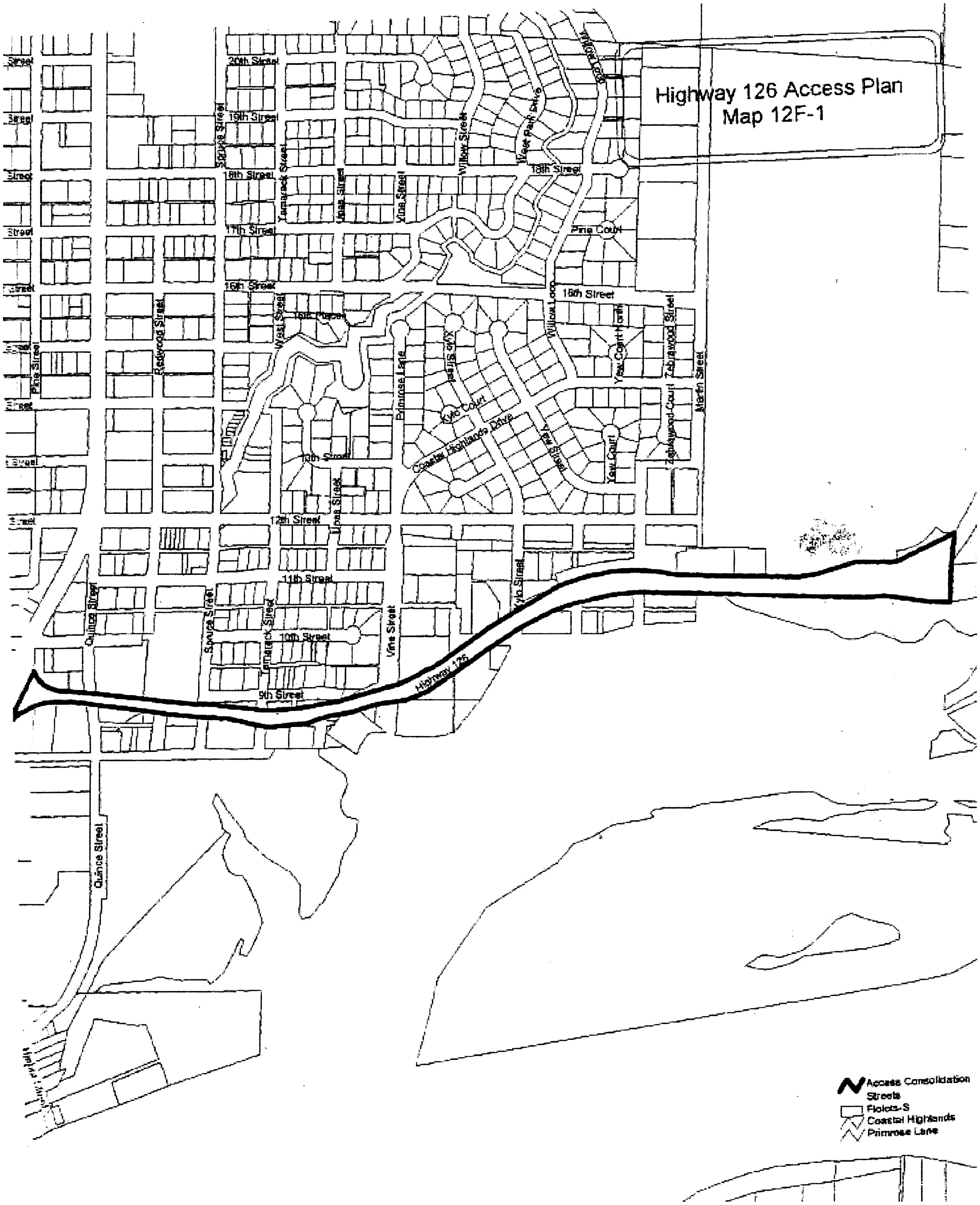
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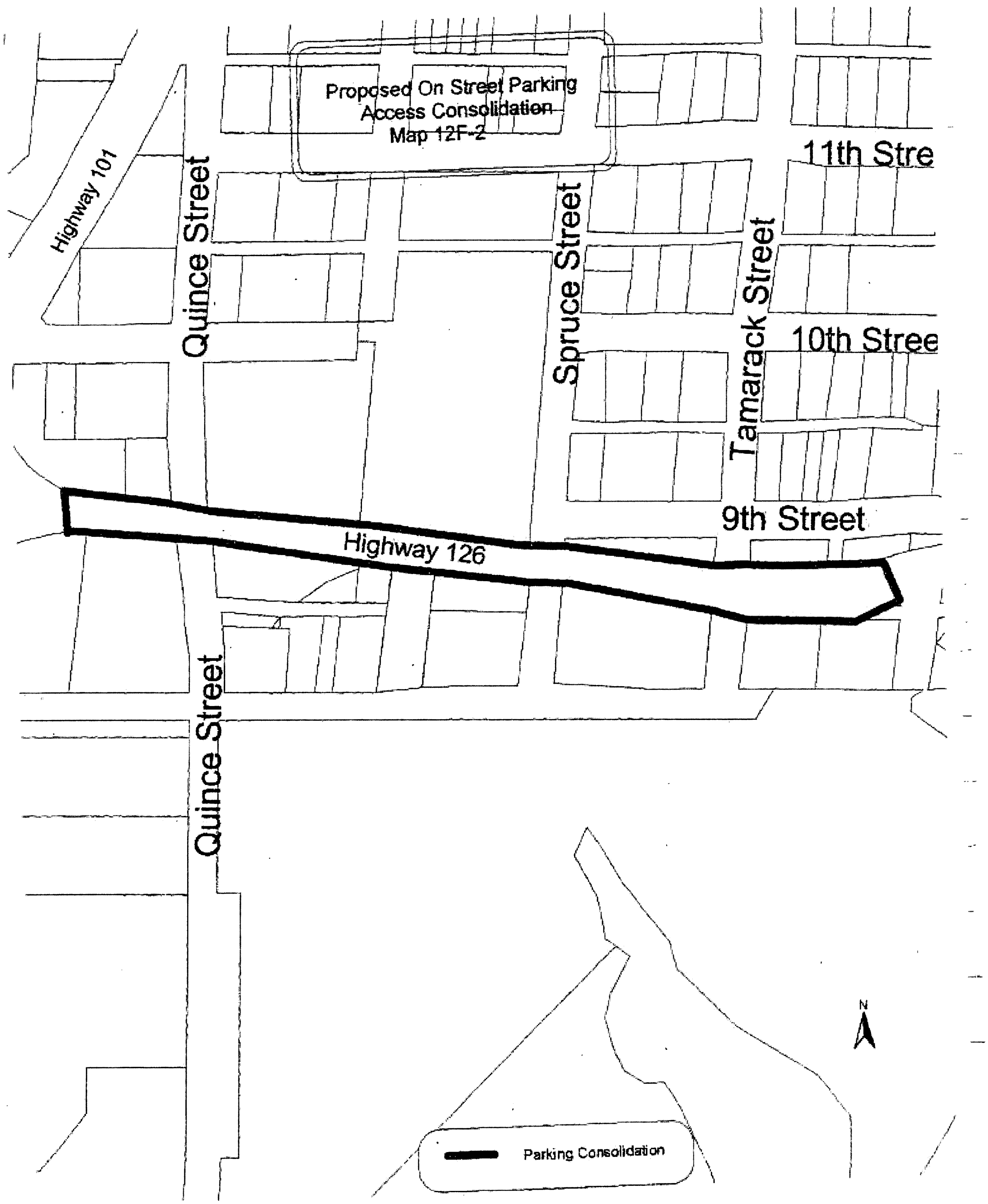
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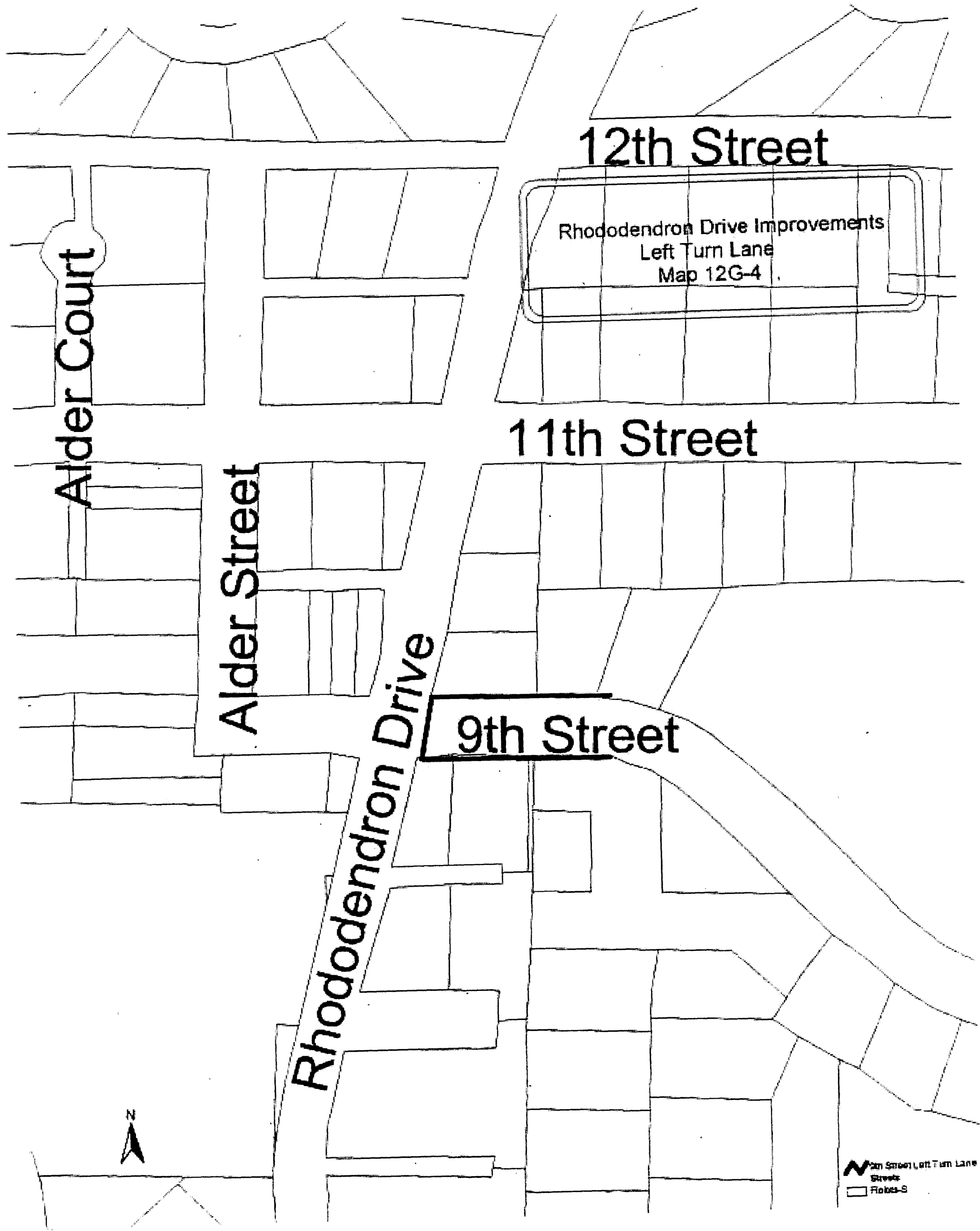
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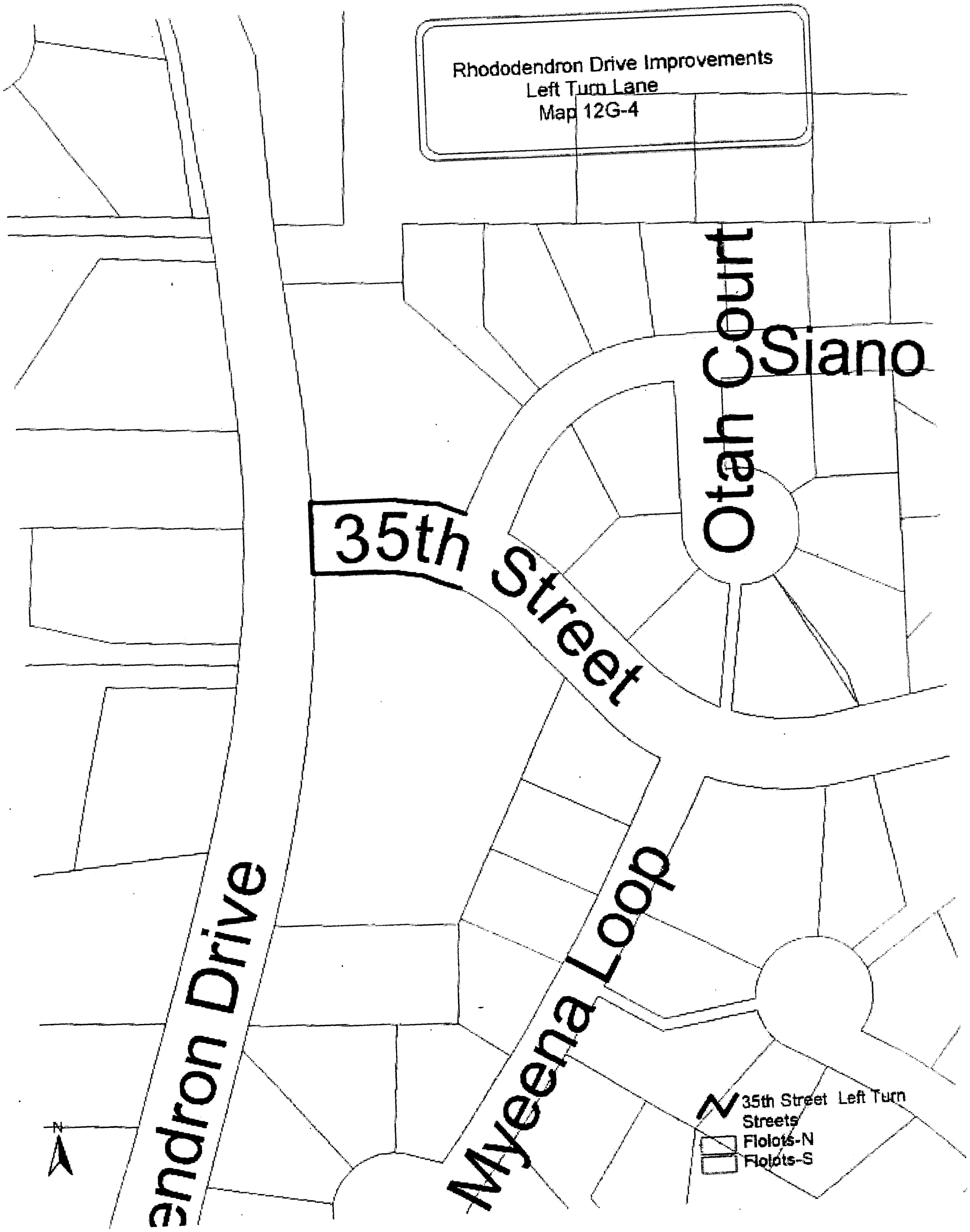
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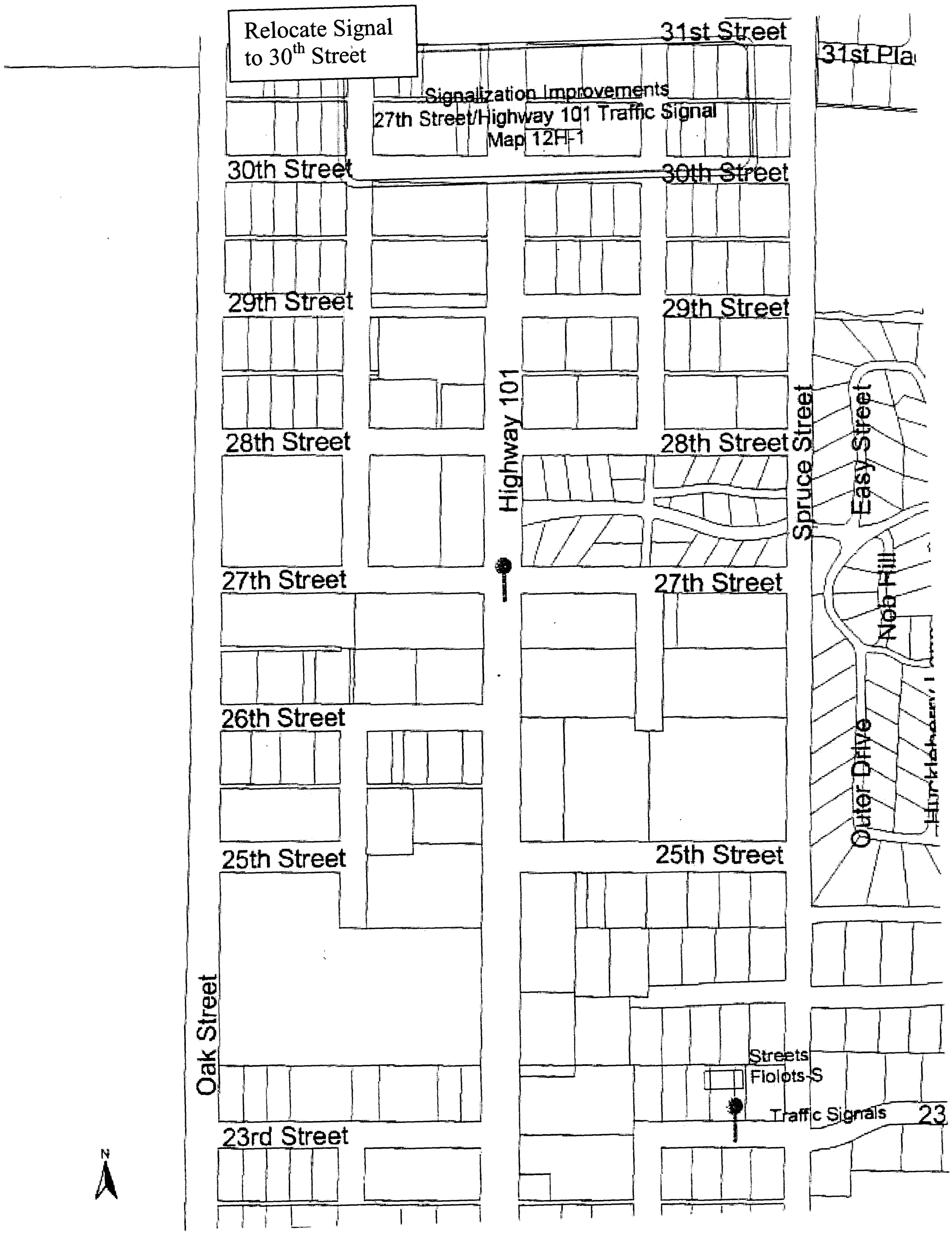
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Change of Entrance
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Streets
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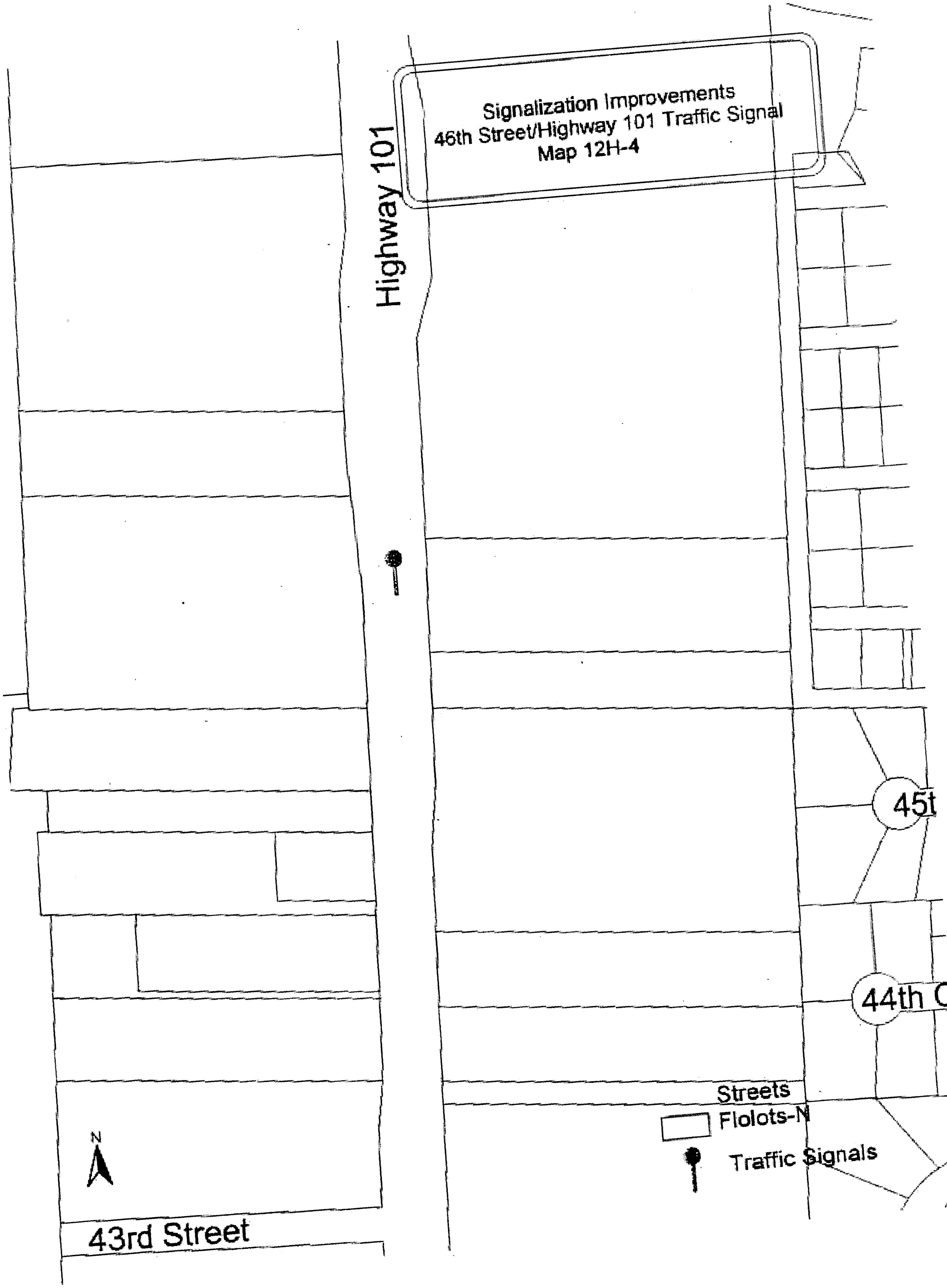
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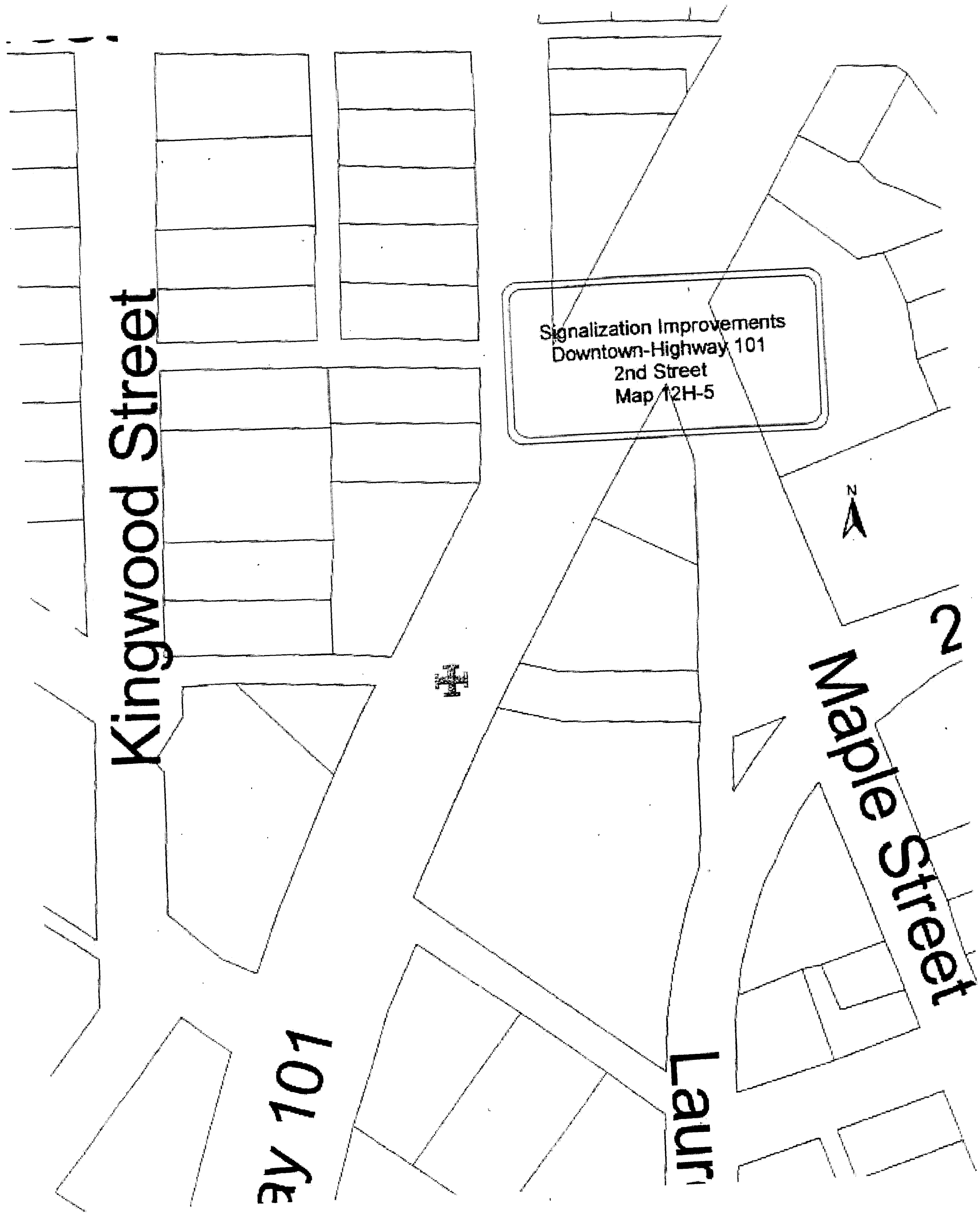
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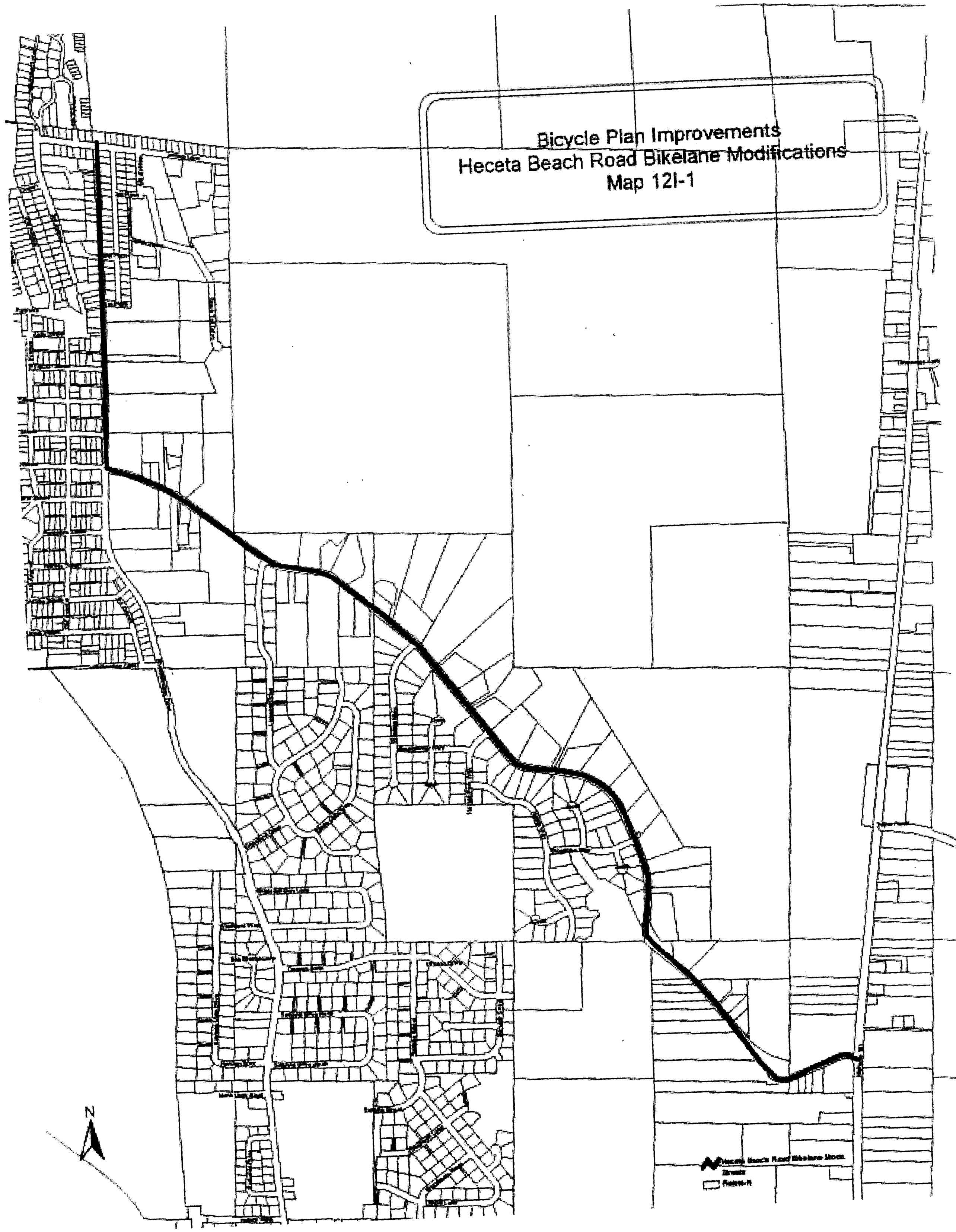
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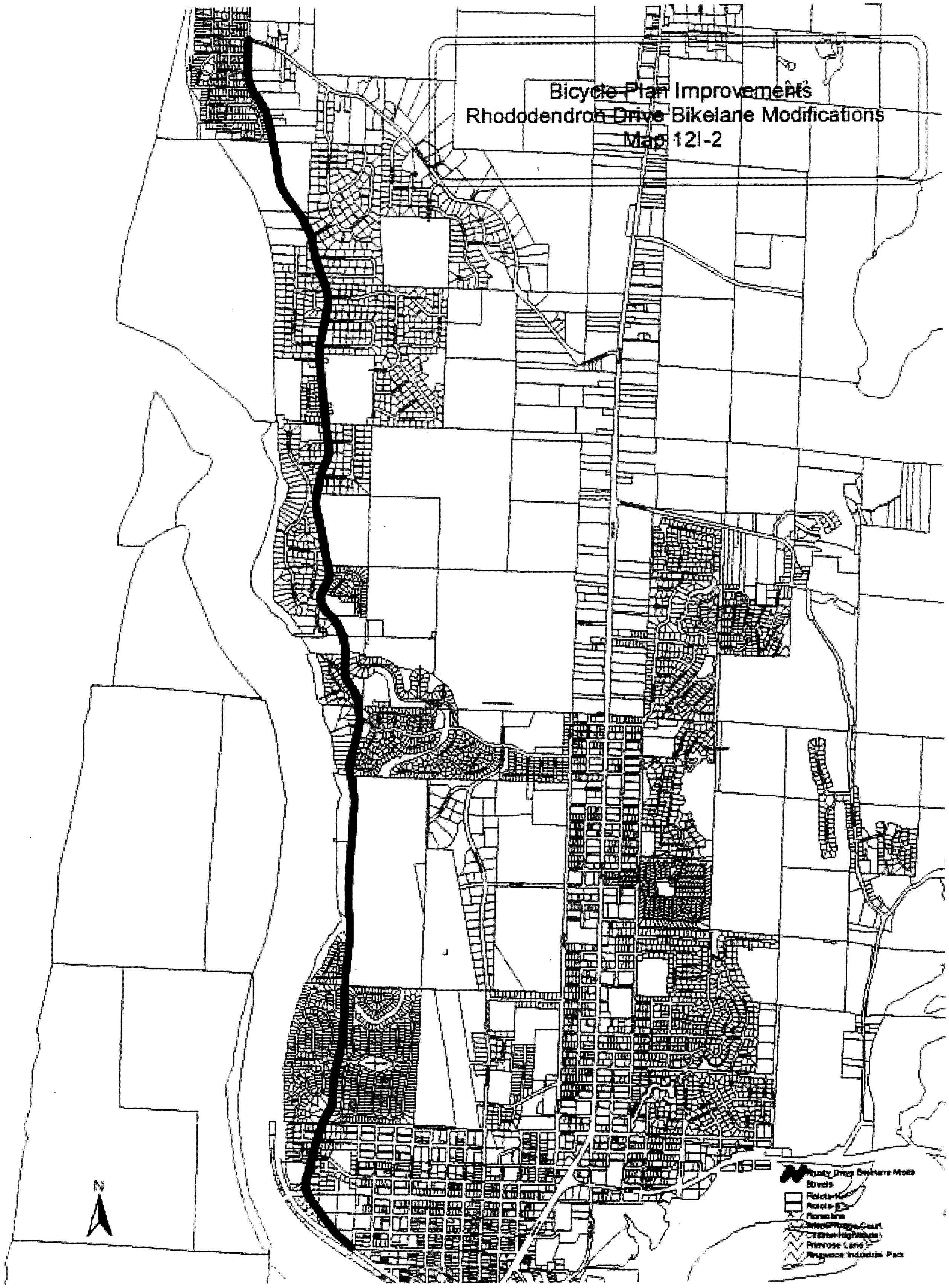
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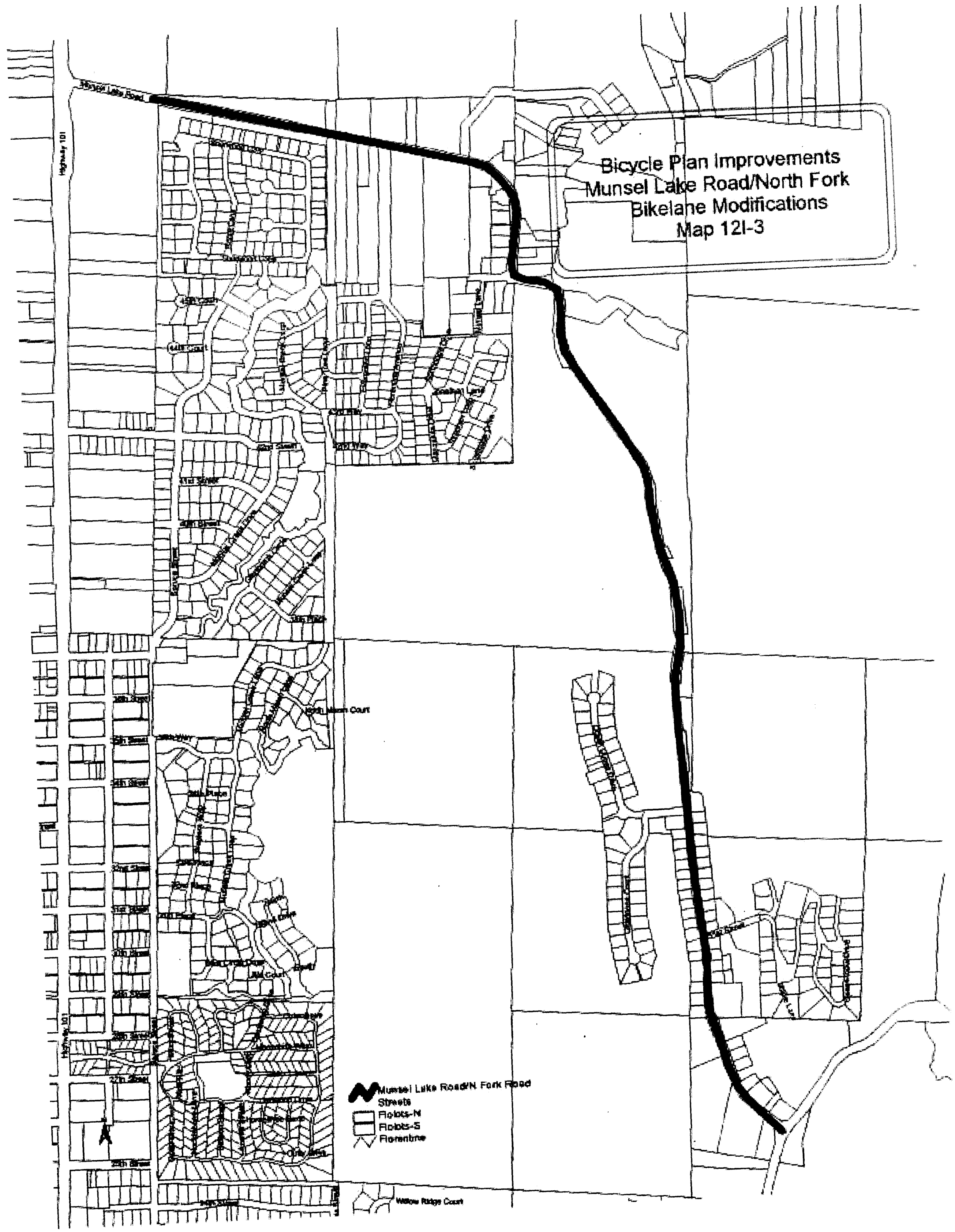
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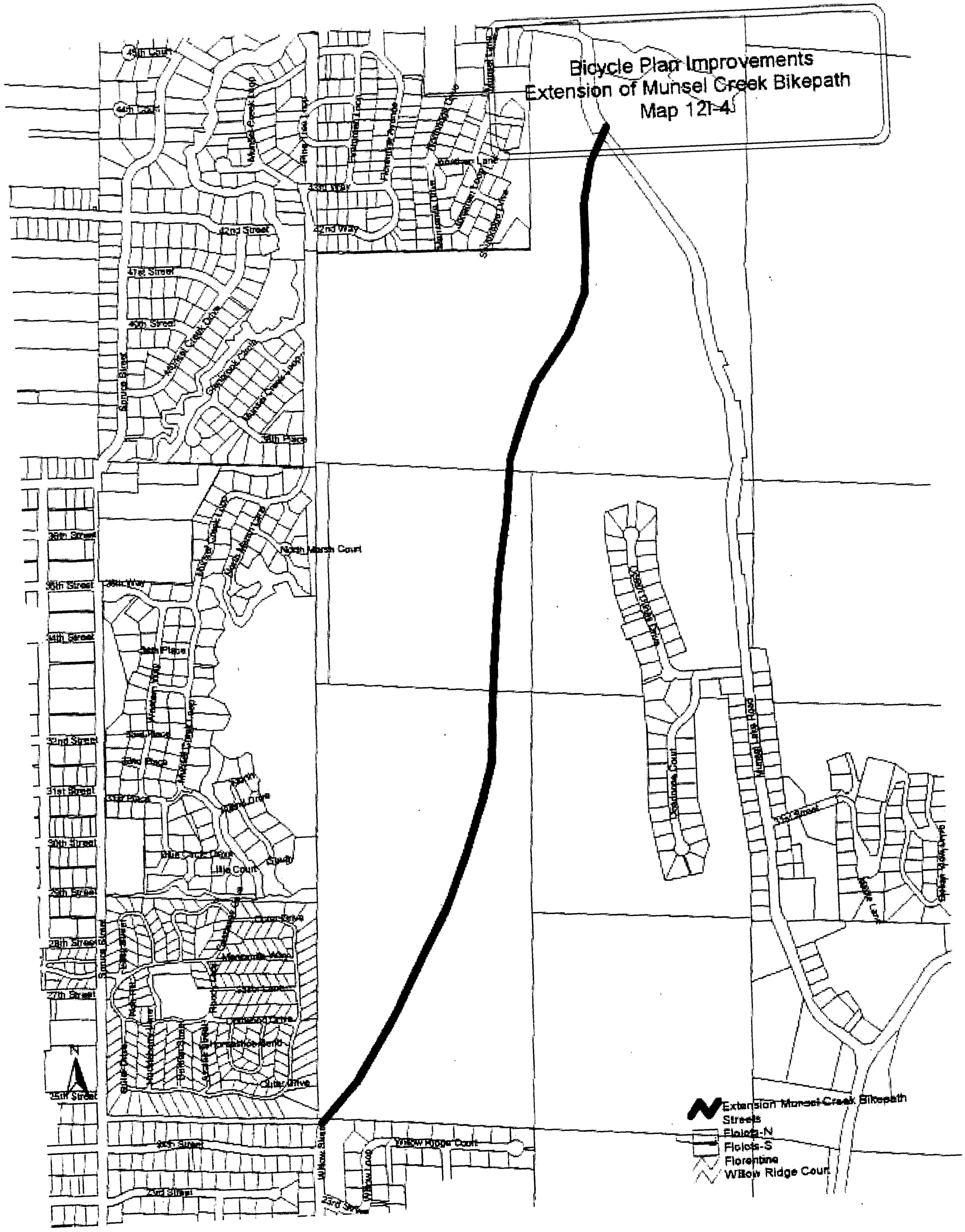
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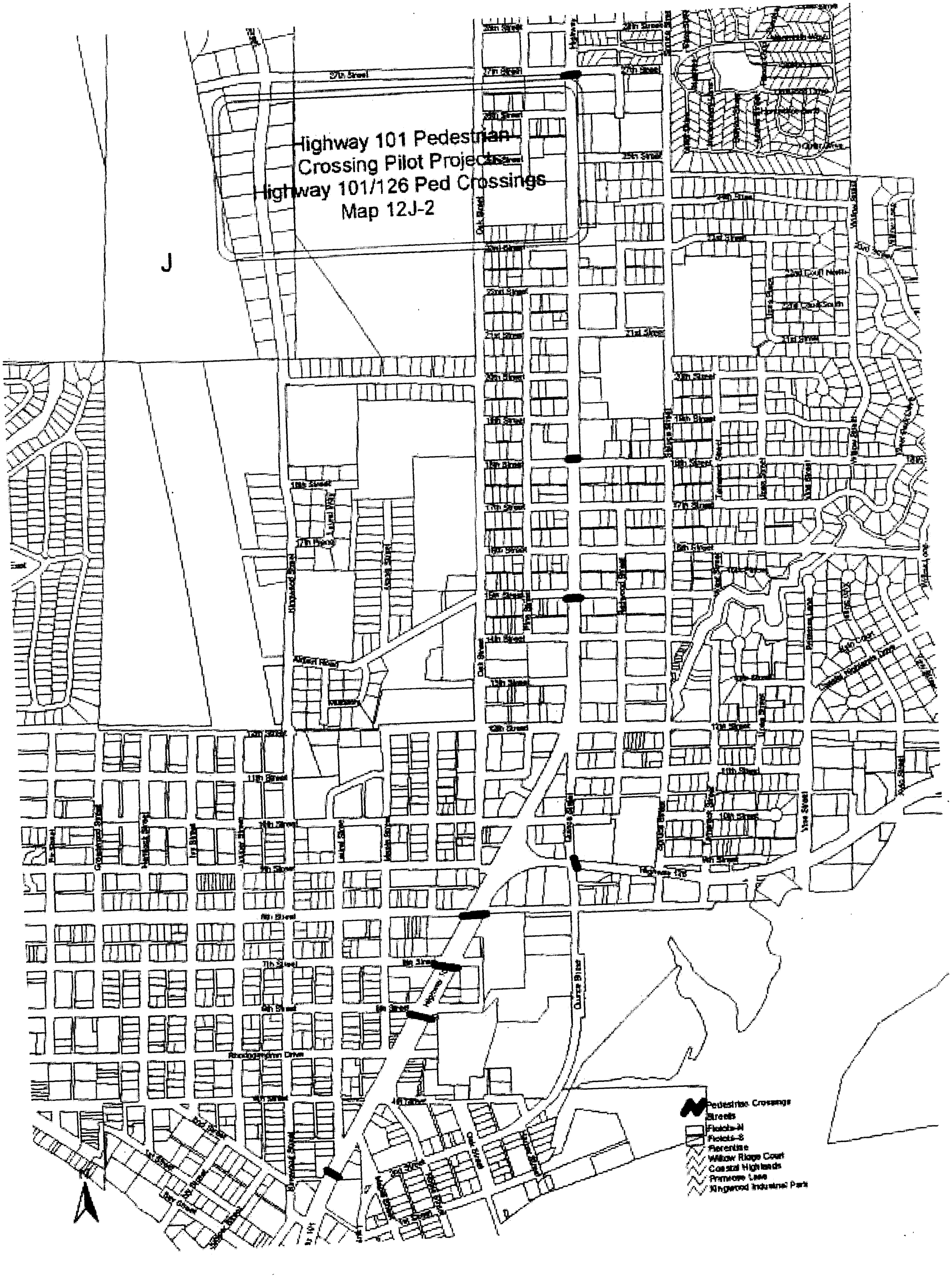
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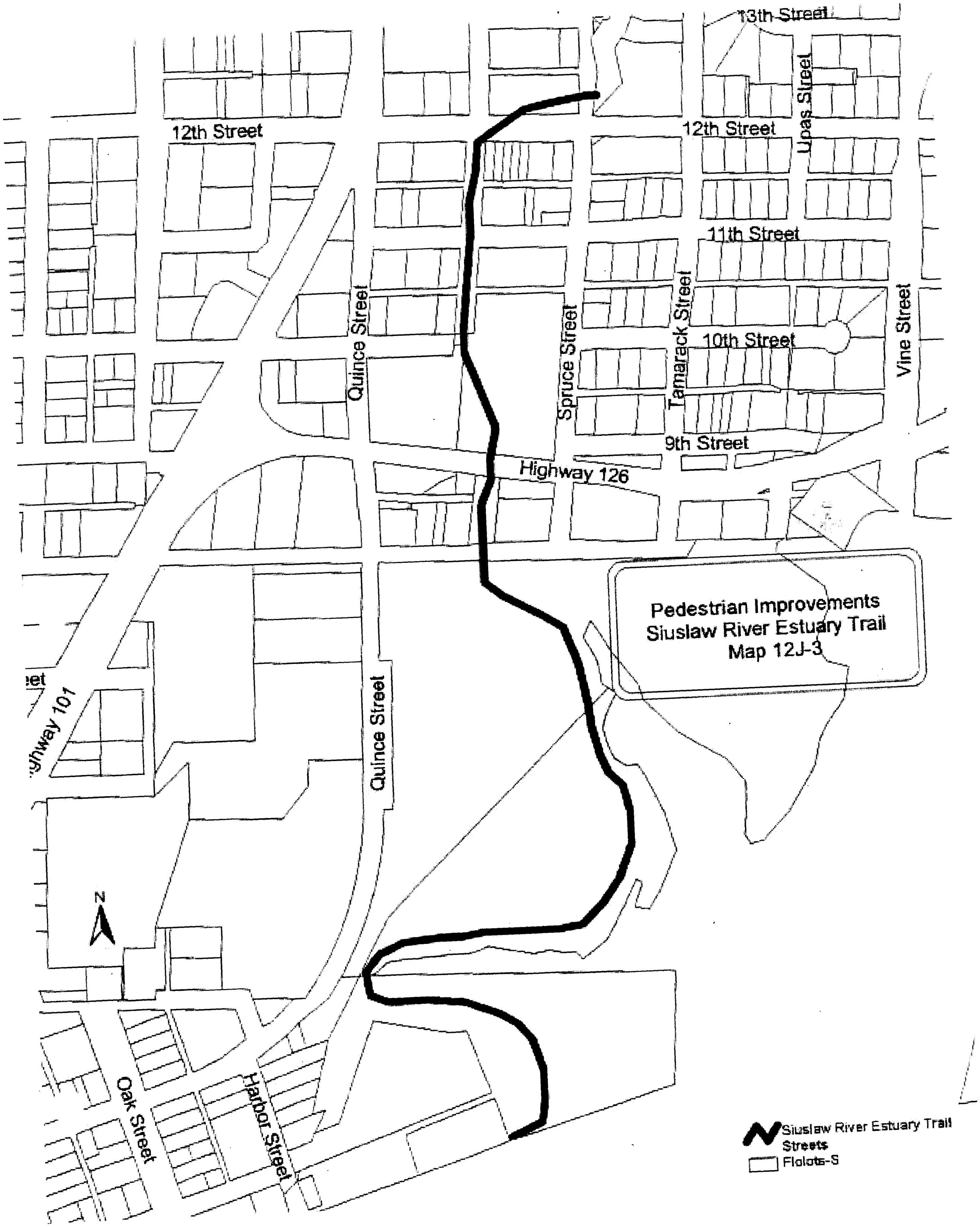
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12th Street
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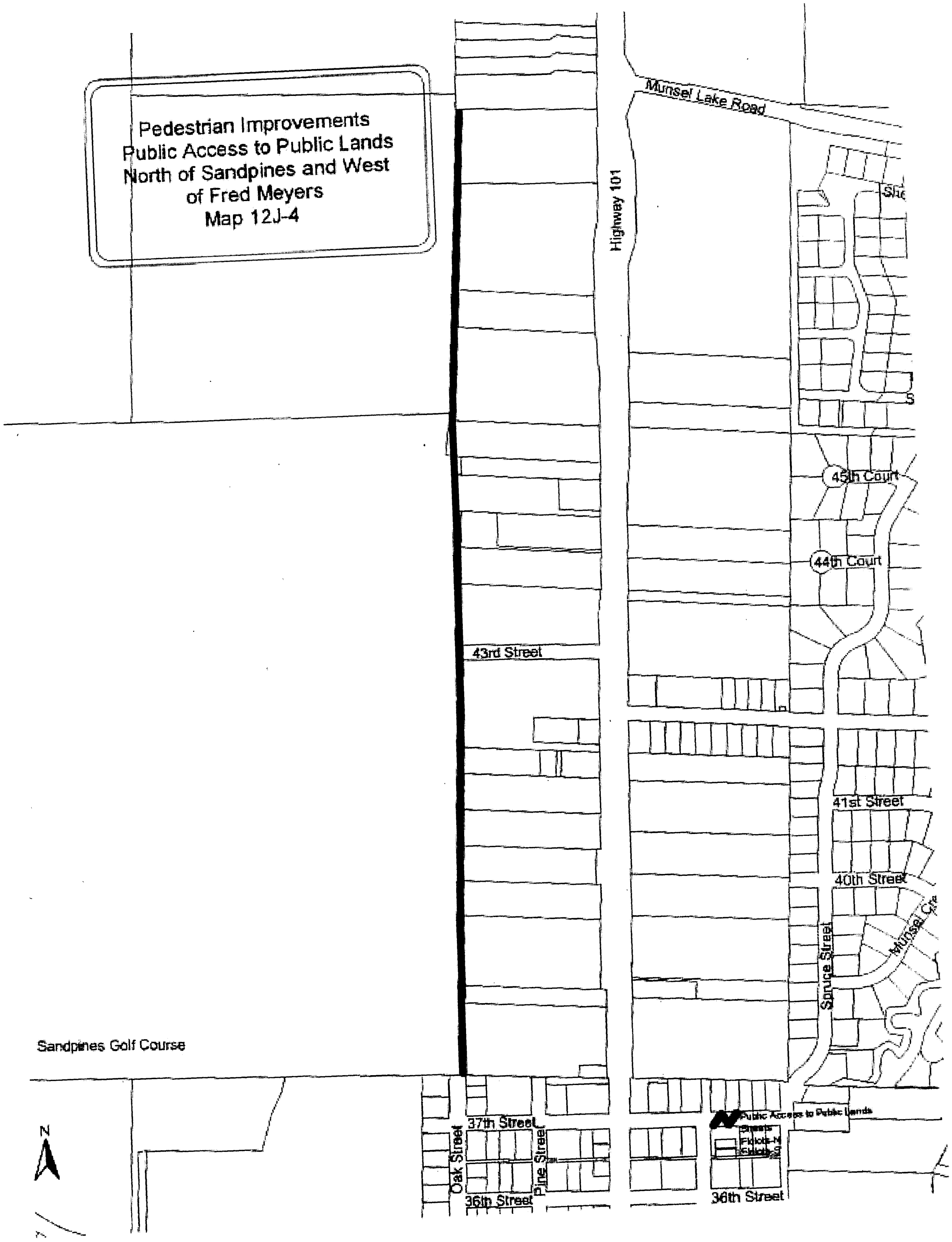
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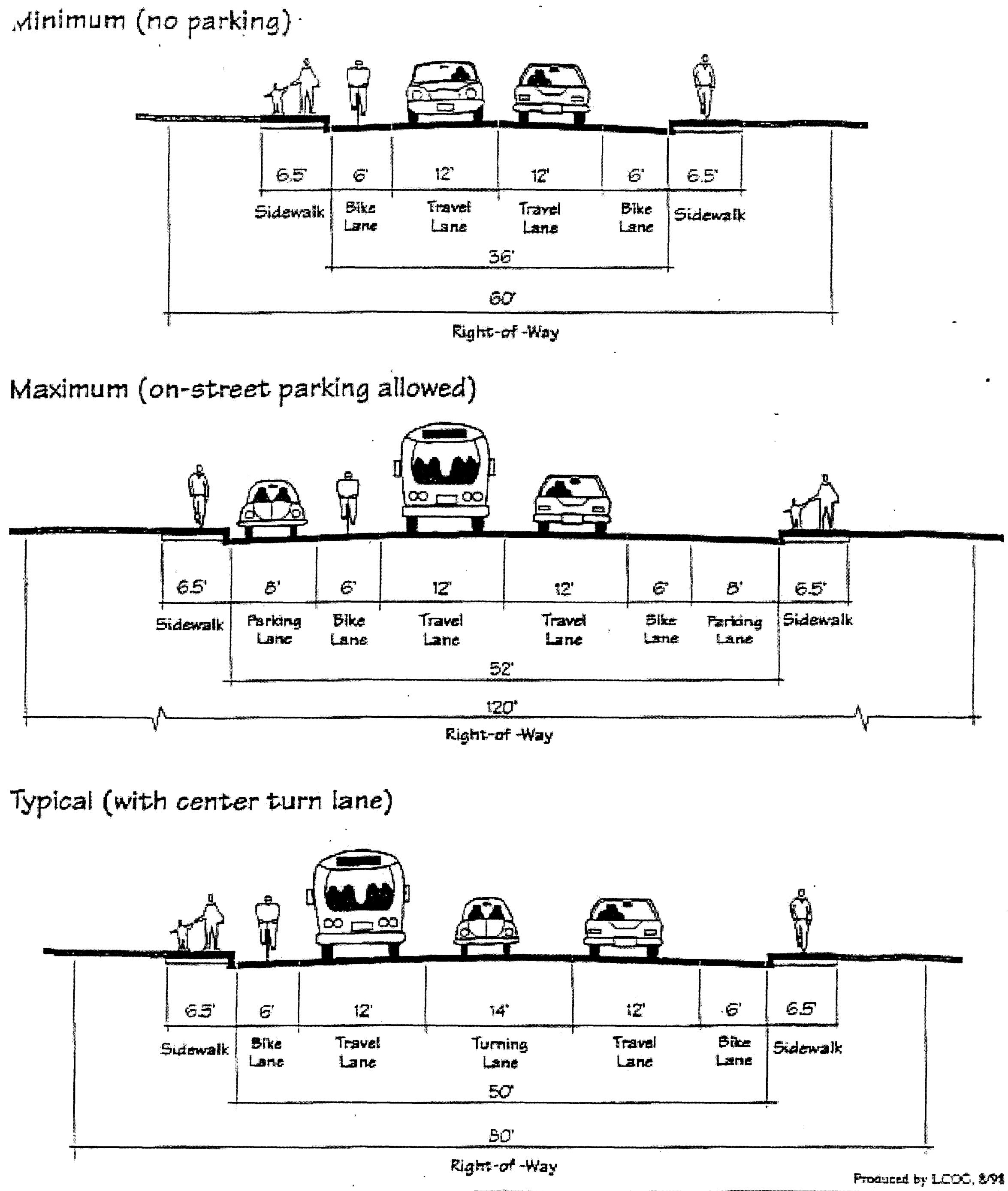
36th Street
N

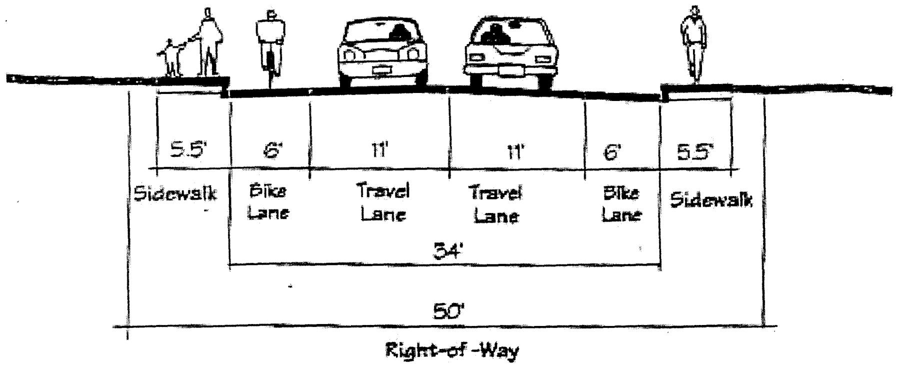
Arterials



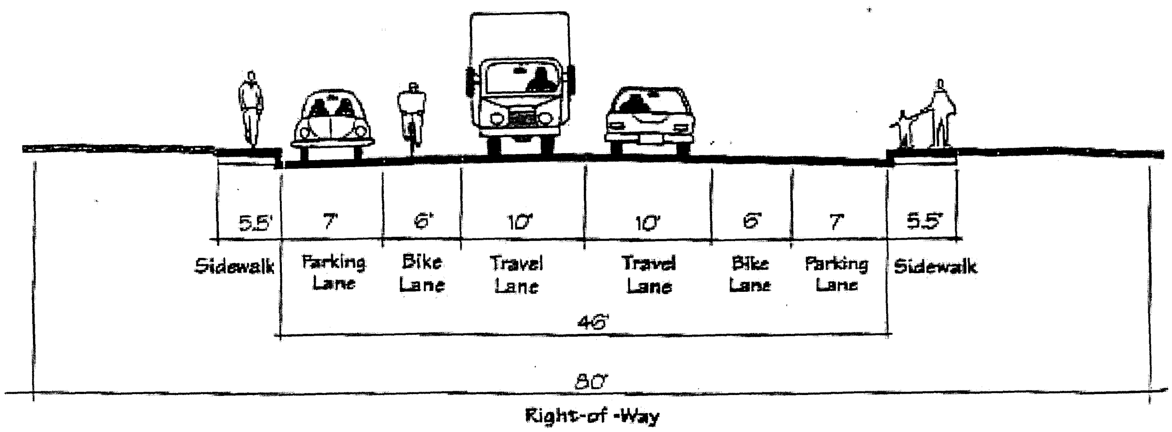
Transportation System Plan
Figure - 1
Proposed Street Standards

Major Collectors

Minimum (with bike lanes and no parking)

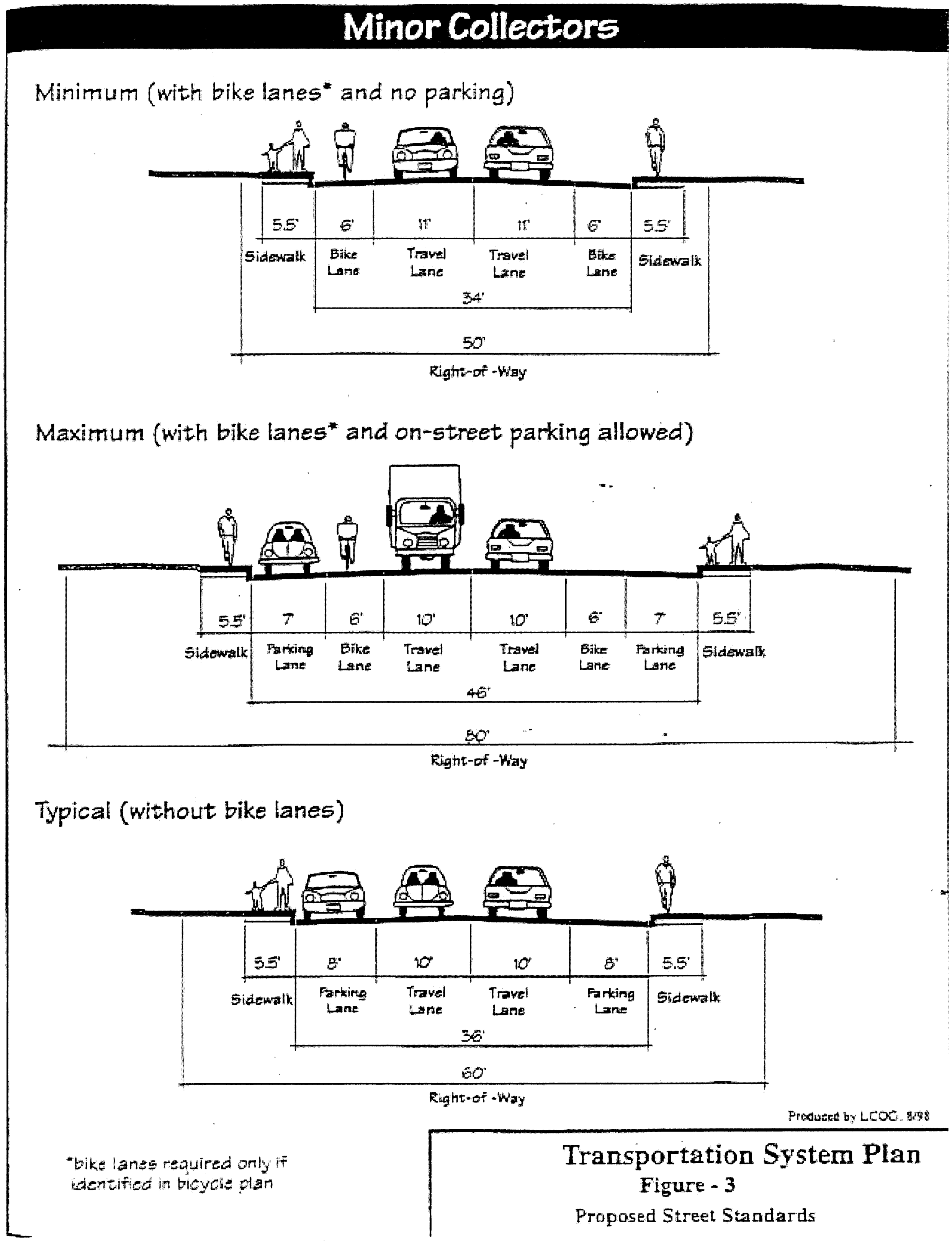


Maximum (with bike lanes and on-street parking allowed)

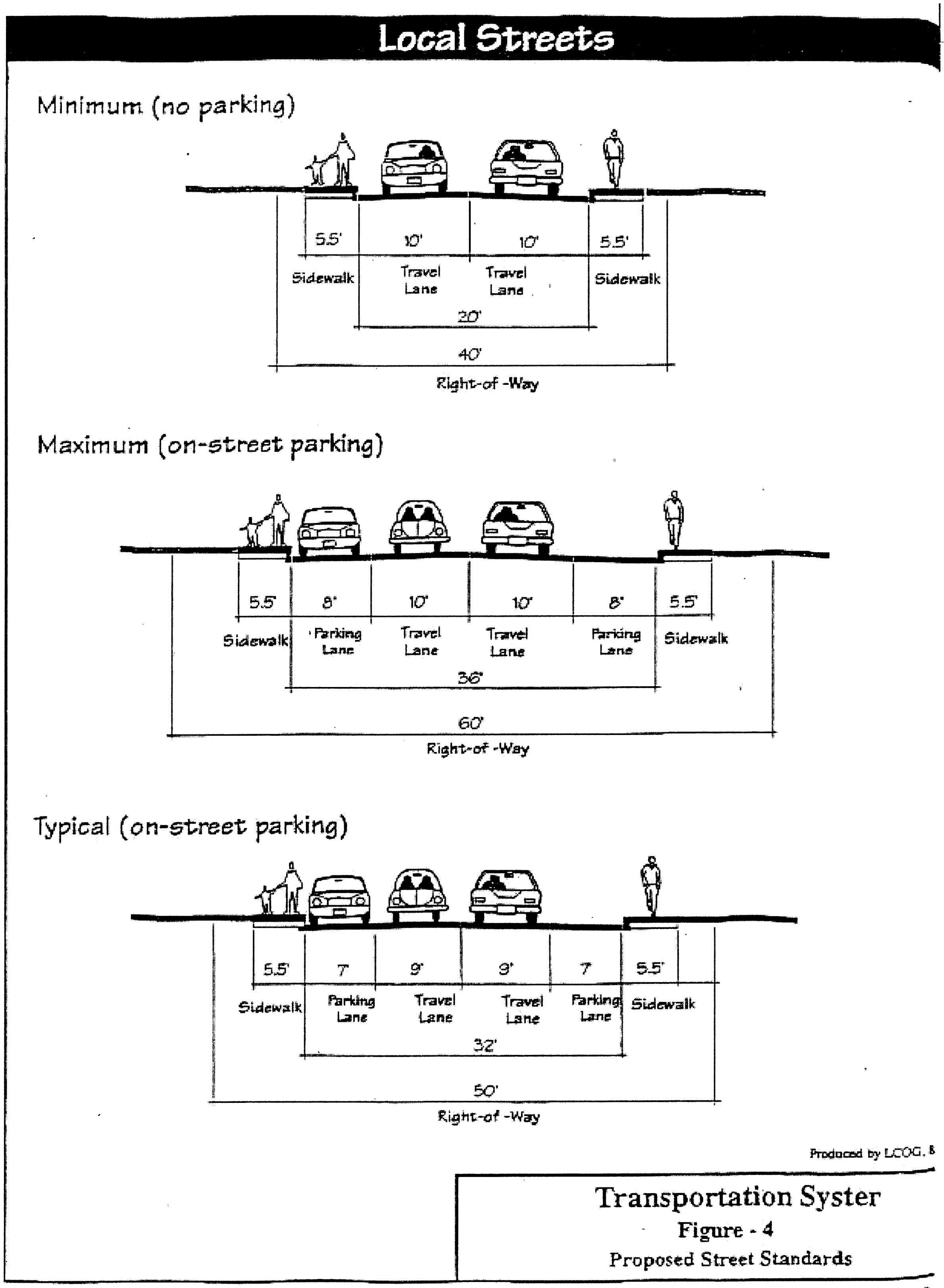


Produced by LCOG, 8/94

Transportation System Plan
Figure - 2
Proposed Street Standards



Transportation System Plan
Figure - 3
Proposed Street Standards


Local Streets
Minimum (no parking)
5.5'
10'
10'
5.5'
Sidewalk
Travel Lane
Travel Lane
Sidewalk
20'
40'
Right-of-Way
Maximum (on-street parking)
5.5'
8'
10'
10'
8'
5.5'
Sidewalk
Parking Lane
Travel Lane
Travel Lane
Parking Lane
Sidewalk
36'
60'
Right-of-Way
Typical (on-street parking)
5.5'
7'
9'
9'
7'
5.5'
Sidewalk
Parking Lane
Travel Lane
Travel Lane
Parking Lane
Sidewalk
32'
50'
Right-of-Way
Produced by LCOG.
Transportation Syster
Figure - 4
Proposed Street Standards

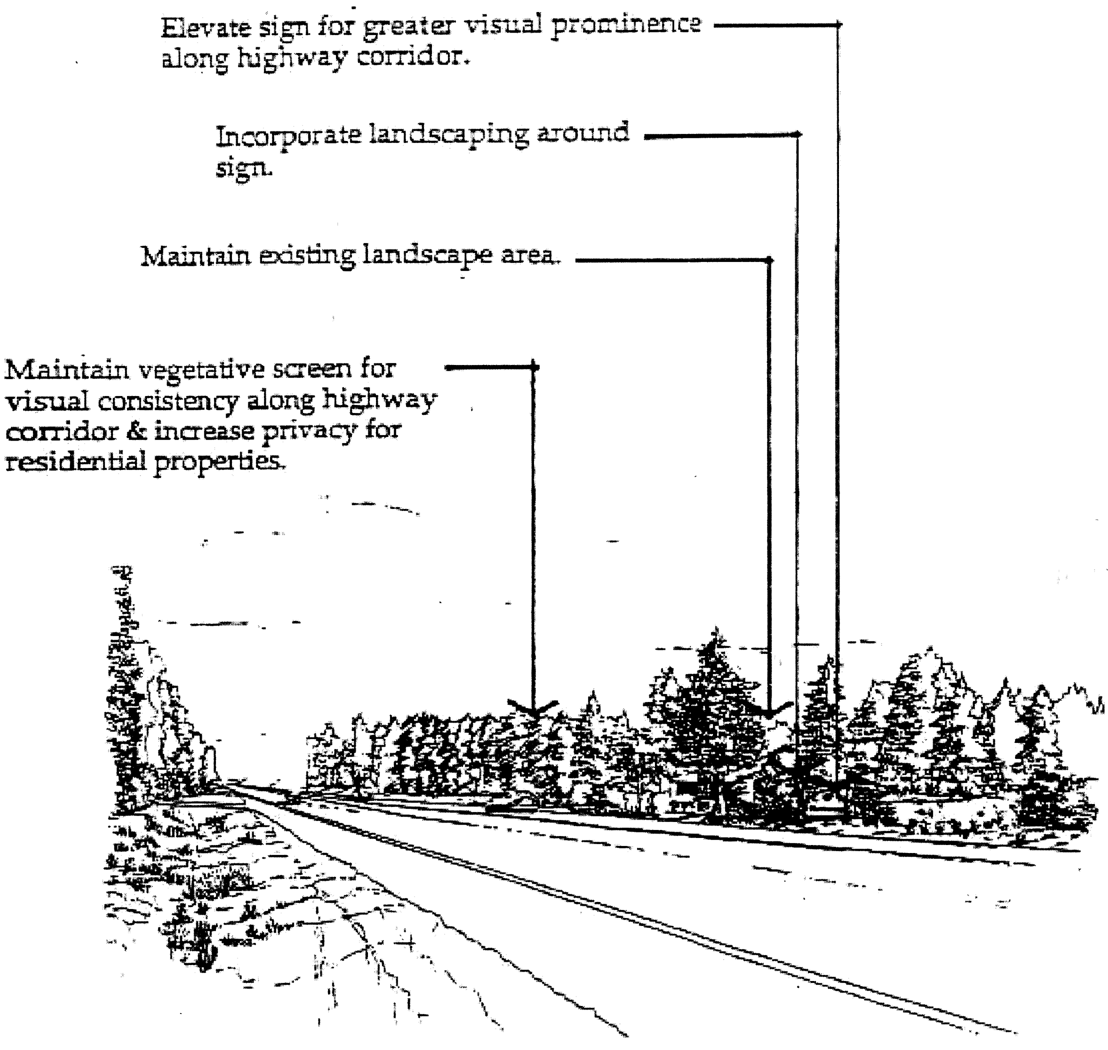


FIGURE 9 – Highway 101 - View southwest to sign location.

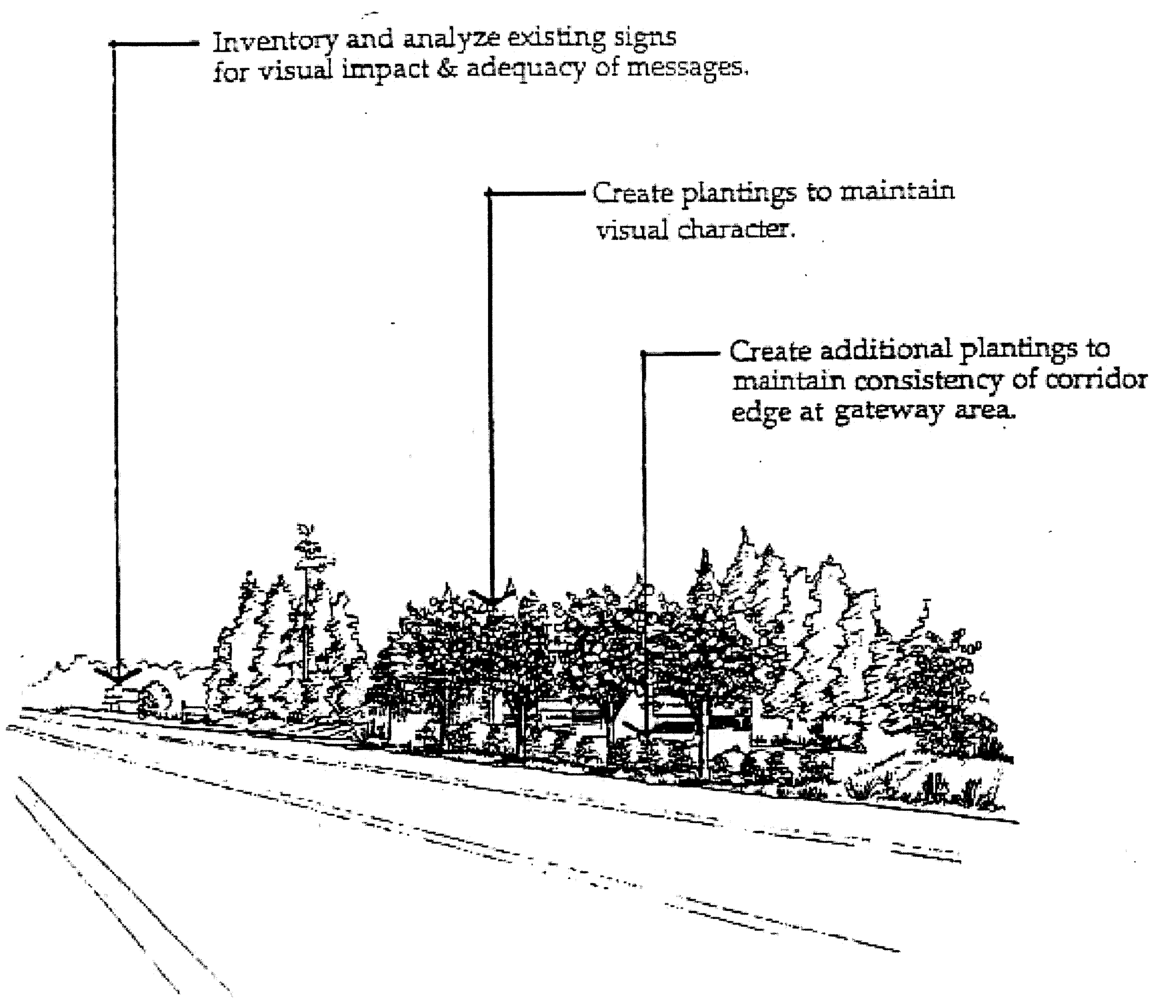


FIGURE 11 – Highway 101 - View northeast to auto-oriented commercial development.

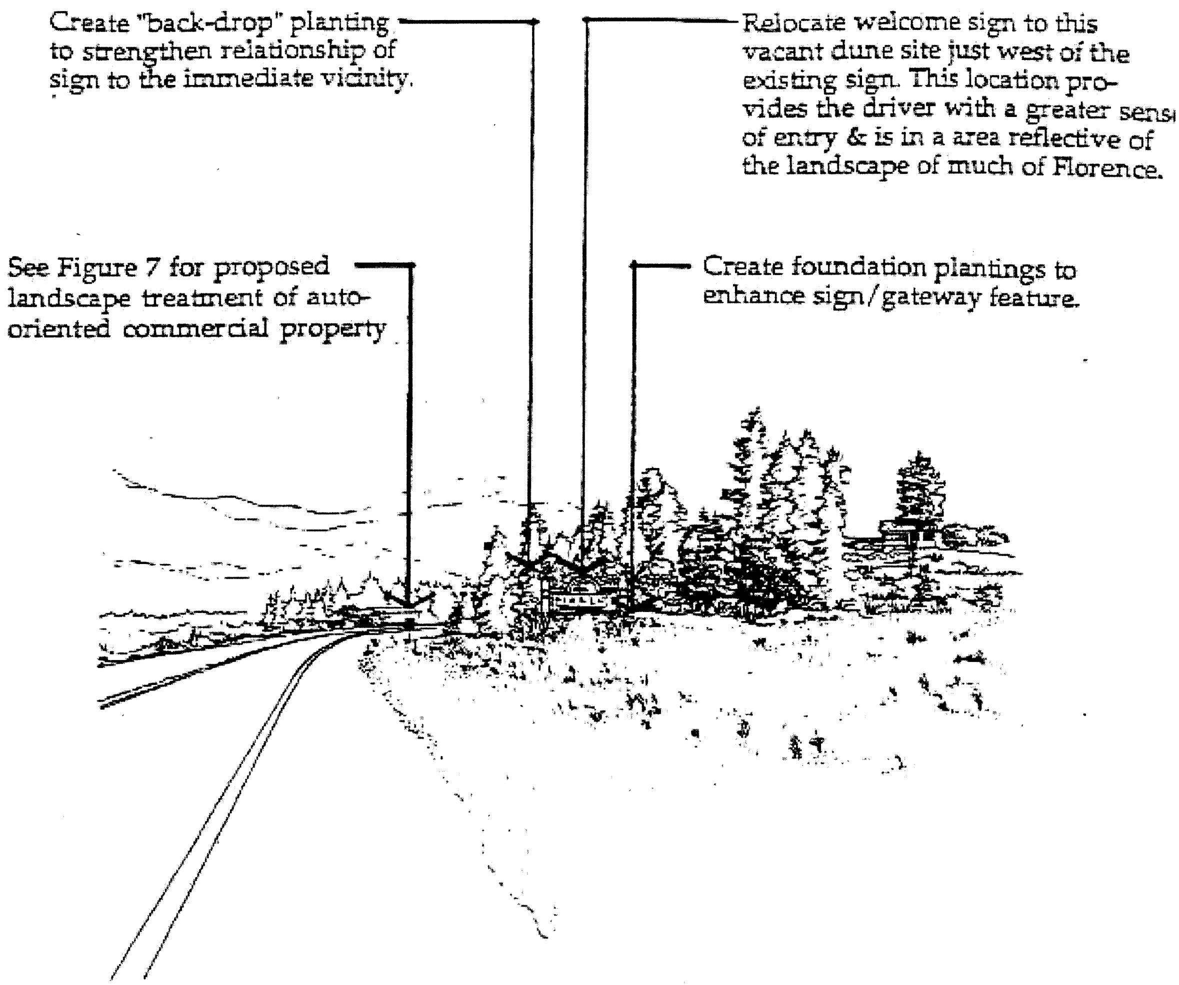


FIGURE 6 – Highway 126 - View northwest to proposed sign location.

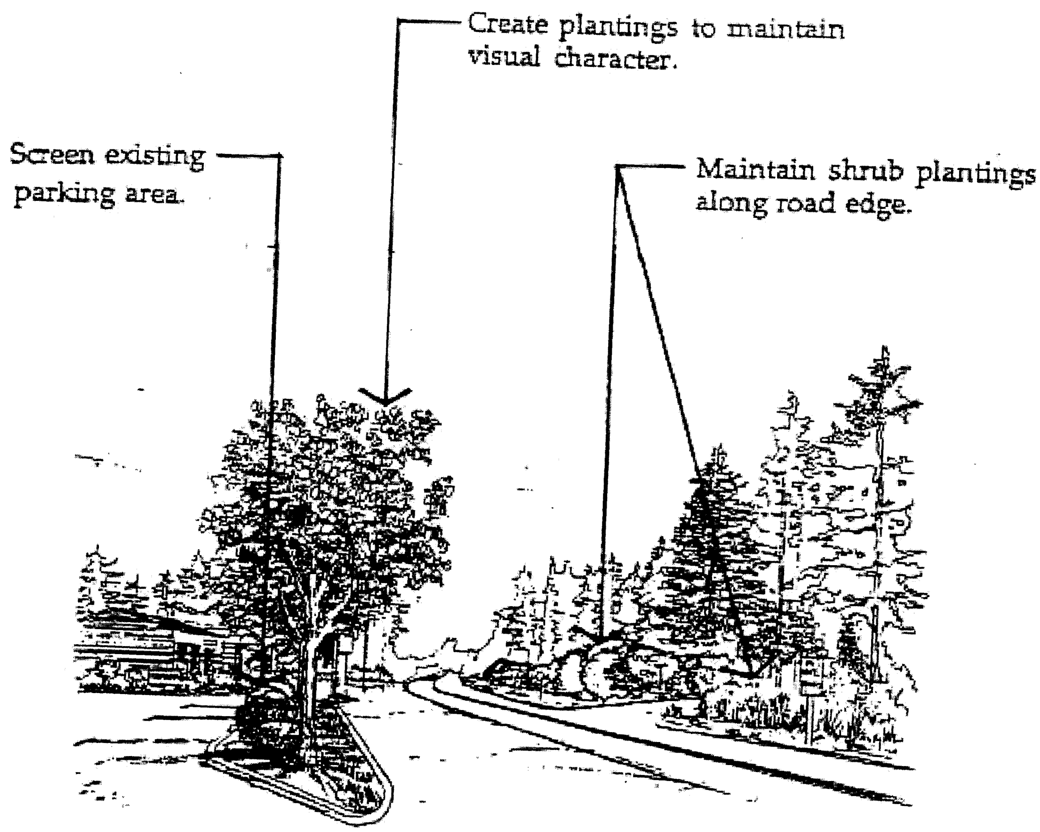


FIGURE 7 – Highway 126 - View southeast to auto-oriented commercial development.

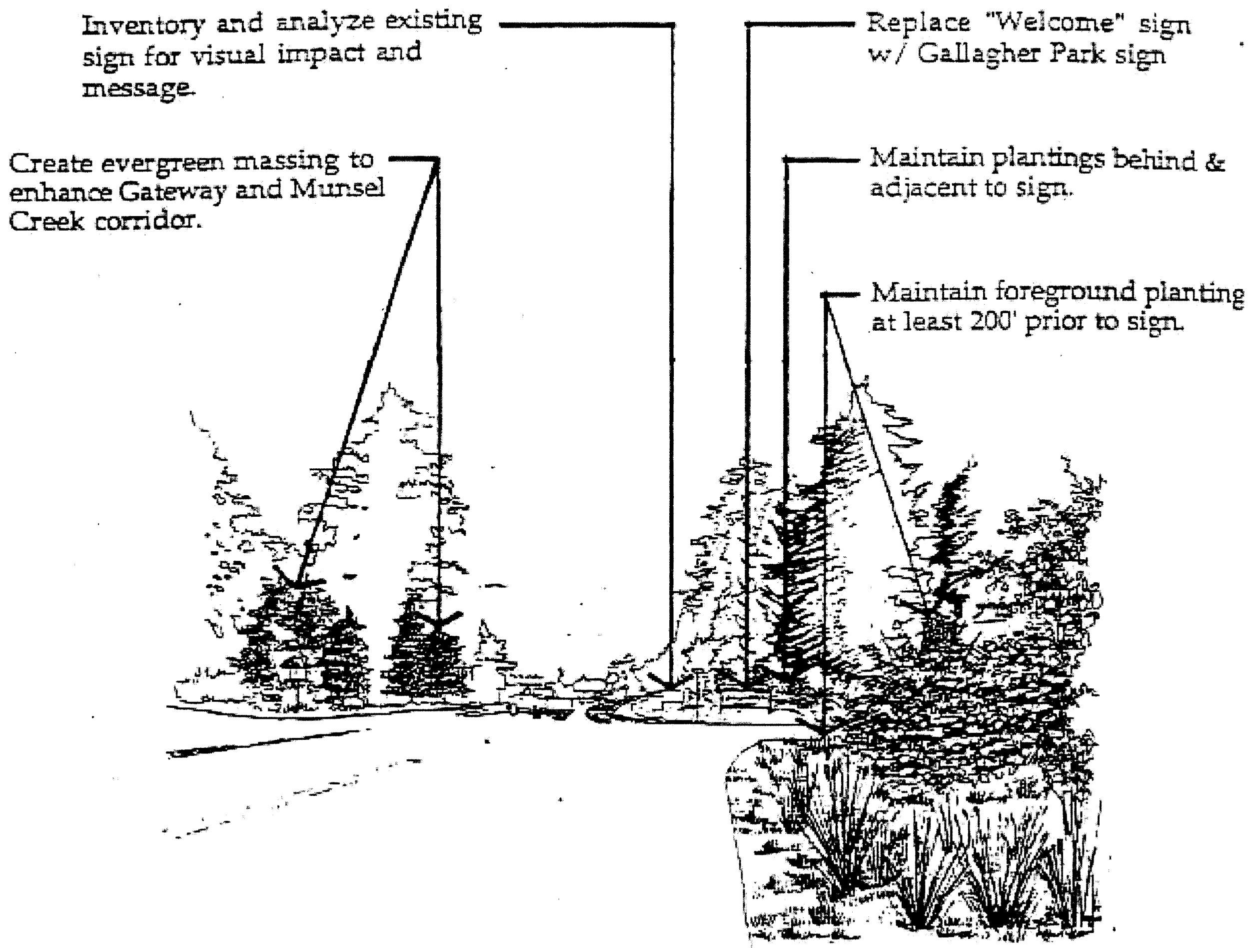


FIGURE 8 – Highway 126 - View west to intersection of Tamarack St. and Highway 126

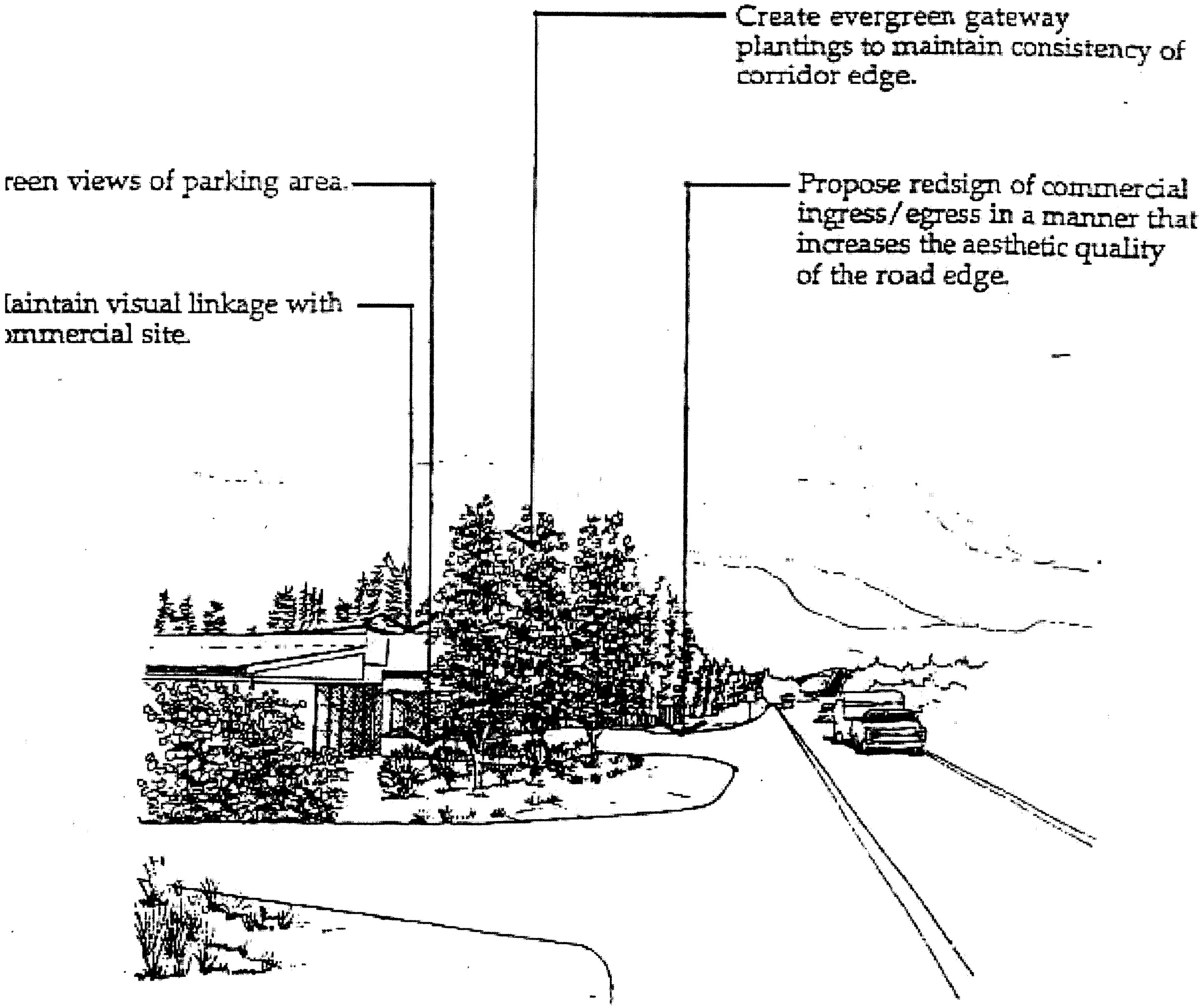


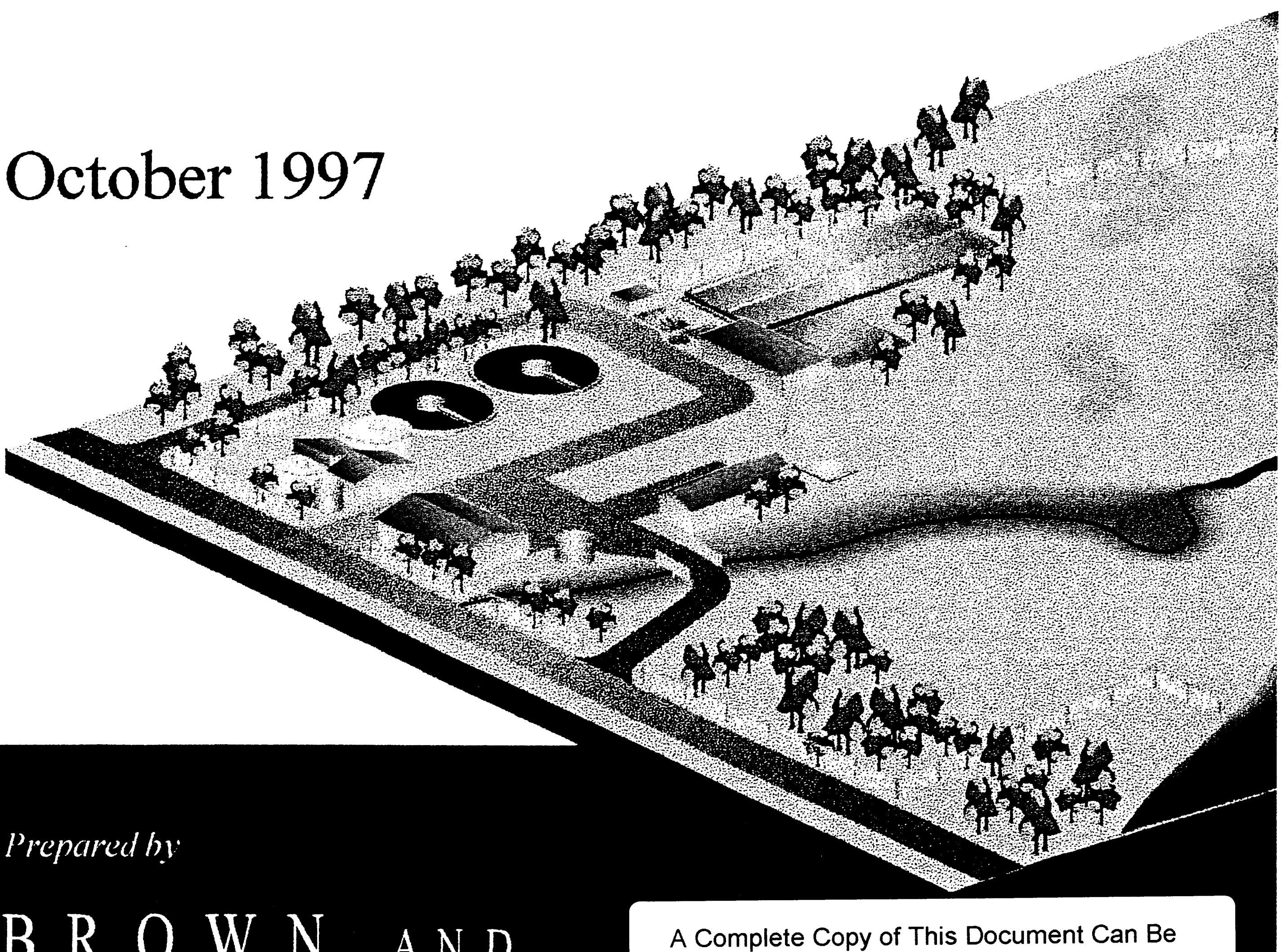
FIGURE 10 – Highway 101 - View northwest to auto-oriented commercial development.

EXHIBIT D

City of Florence

Wastewater Facilities Plan

October 1997



Prepared by

BROWN AND CALDWELL

A Complete Copy of This Document Can Be Viewed In Florence At City Hall, And At The County Administration Office Or The Land Management Division Office, Both Located At: 125 E 8th Avenue, Eugene

City of Florence

Wastewater Facilities Plan

October 1997

REGISTERED PROFESSIONAL ENGINEER
16,976
OREGON
JAN. 18, 1994
JONATHAN D. BEER
EXPIRES 12/31/97

BROWN AND CALDWELL

BROWN AND CALDWELL

September 30, 1997

Mr. Ken Lanfear
Director of Public Works
City of Florence
250 Highway 101
Florence, Oregon 97439

13-4141

Dear Mr. Lanfear:

We are pleased to present this final copy of the City of Florence Wastewater Facilities Plan. In August 1996, we began developing your plan to meet the city's wastewater collection and treatment needs through the year 2020. The city has long recognized its responsibility to protect the environment and provide efficient municipal services. New regulatory requirements and the end of the extended drought period have resulted in occasional discharge permit violations. This plan will allow the city to move forward quickly to implement the long-term improvements and avoid future violations.

The study begins with an evaluation of the study area characteristics and the existing treatment plant. Note that the study area limits have been modified since the draft report was published. Wastewater flow and loading characteristics are then developed, followed by a review of the regulatory requirements. Treatment alternatives are developed and evaluated on the basis of cost and non-cost criteria to a select a recommended plan.

The recommended plan focuses on meeting the current Department of Environmental Quality (DEQ) requirements while making provisions for future system expansion. The technology selected offers a high level of reliable treatment as well as economical and flexible operation. Innovative refinements to proven technology will allow this facility to accommodate more stringent future treatment limits.

A planning effort of this magnitude requires the cooperation of many participants. We acknowledge the considerable efforts of the City of Florence Public Works Department, the City Council, and other city staff. Many hours were spent providing us with background data, brainstorming alternatives, and reviewing draft report sections. We recognize the DEQ's efforts in providing guidance and support for this project.

We congratulate the city on the successful completion of this important planning document. Our entire team is eager to begin implementing your final, approved plan.

Very truly yours,

BROWN AND CALDWELL

John Holroyd
Project Manager

Jon Beer
Project Engineer

JEH:ps

Environmental Engineering And Consulting • Analytical Services

1025 Willamette Street, Suite 300, Eugene, Oregon 97401-3199
(541) 686-9915 Fax (541) 686-1417

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CHAPTER 1

EXECUTIVE SUMMARY

This facilities plan outlines how the City of Florence will meet the community's wastewater treatment needs for the next 20 years. The development of planning information is provided first. The plan then presents a range of alternatives to meet the wastewater treatment requirements resulting from growth within the study area and more stringent regulations. The alternatives are evaluated in detail to determine the best plan for the city. A recommended plan is developed based on the evaluation of economic and non economic comparisons. Costs and construction phasing opportunities for the recommended plan are discussed.

CURRENT WASTEWATER SYSTEM

The City of Florence's existing treatment plant uses a conventional activated sludge process. The process includes preliminary screening and grit removal, secondary treatment, disinfection by chlorine, and sludge handling to treat biological solids created during the process. Secondary treatment is a biological process that uses bacteria to consume dissolved organic material from the wastewater. Solids are created during the secondary process. The residual solids, known as sludge, then are collected for digestion, which breaks the sludge down further and makes it more stable. The digested sludge is then disposed of through beneficial agricultural use on land. The treated liquid stream, or effluent, is disinfected and discharged to the Siuslaw River about 4 miles upstream of the mouth of the river.

The existing plant has limitations in both the amount of wastewater it can treat and the degree of treatment which can be achieved. Reliability is low due to the age of some of the components and the lack of redundancy in major process units. As a result, several violations of the discharge permit have occurred in recent years, leading to concerns about the adequacy of the plant.

The collection system includes gravity sewers, pump stations, and pressure mains. The entire system is divided into a number of basins. The gravity sewers within a basin collect wastewater from users and convey it to a pump station. Each pump station pumps the wastewater through a pressure main to the treatment plant.

Many of the sewers in the older parts of town are in poor condition, allowing stormwater to enter the system, causing excessively high flows during the winter. Furthermore, the largest pump station is unable to handle the high flows during rainstorms, resulting in bypasses of untreated wastewater to the river.

FUTURE WASTEWATER TREATMENT NEEDS

Future needs for wastewater treatment are determined in part by growth projections for the study area. Growth projections are used to predict future wastewater flows, which in turn, govern the sizing of treatment processes.

STUDY AREA

The study area encompasses the proposed Florence Urban Growth Boundary (UGB). The proposed UGB is the same as the existing UGB with the exception of two additions on the east side. Comprehensive wastewater planning involves consideration of both physical and socioeconomic characteristics within the study area. Physical elements include climate, topography, soils, and local water resources. Socioeconomic characteristics include population, employment outlook, and growth projections.

Climate

The coastal climate is characterized by mild temperatures and frequent precipitation. The average monthly temperatures vary from about 44 degrees in January to about 60 degrees in August. Precipitation averages about 72 inches, mostly in the form of rain. About 70 percent of the rainfall occurs in November through March.

Topography

The study area is in a coastal terrace area characterized by gently rolling terrain dominated by sand dune formations. Slopes range from 0 to 10 percent, flat enough for development in most of the study area. Land elevations range from about 10 feet to 100 feet above sea level.

Soils

Most of the Florence area soils are derived from sand dunes. Formations include active dunes, stabilized dunes, and deflation plains. The active and stabilized dunes are composed of sandy, well drained soil. Deflation plains, consisting of interdune areas eroded by wind down to the level of the summer groundwater table, are poorly drained and subject to high groundwater. Sewers in these areas are subject to corrosion and infiltration of groundwater. Much of the geology of the Florence area comprises unconsolidated sand and layers of compressible organic materials. The unconsolidated sand could cause instability during an earthquake. The presence of compressible organic materials may require that special foundations be used for treatment plant structures to prevent settling.

Water Resources

The principle water resource for planning purposes is the Siuslaw River and its estuary. The river drains an area of about 770 square miles. The average annual discharge is 2,400 cubic feet per second (cfs). The minimum summertime flows are about 100 cfs.

The river and estuary are heavily used for recreation, mainly fishing and boating. Recreational crabbing and clamming are prevalent in the area.

As required by the Clean Water Act, the Oregon Department of Environmental Quality maintains a list of streams for which one or more water quality parameters exceed the standards set by the Act. The Siuslaw exceeds the standards for temperature in the summer. Consequently, no measurable increase in stream temperature is allowed as a result of treatment plant discharges.

Population

The current service population is estimated to be 6,401. Service is currently limited to areas within the city limits. The estimated population for the entire UGB is 7,856. An average annual growth rate of 3.5 percent was assumed for the study period. This is within the 2.3 to 3.7 percent range assumed for the Comprehensive Plan. The projected populations presented in Table 1-1 are based on applying the assumed growth rate to the current estimated populations. Because the wastewater service area is expected to expand to the entire UGB, the design population is selected as the projected UGB population of 17,937.

Table 1-1. Florence City and UGB Population Projections.

	Population[a]	
Year	City	UGB
1996	6,401	7,856
2020	14,617	17,937

Note: [a]Projections based on 3.5 percent annual growth rate.

WASTEWATER CHARACTERISTICS

The primary wastewater characteristics important to treatment plant design are flows and waste loads. Flow is a measure of the volume of liquid entering the plant, normally expressed in millions of gallons per day (mgd). Waste loads are measures of the strength of the waste. The two types of loads important for design are total suspended solids (TSS) and biochemical oxygen demand (BOD). TSS is a measure of the amount of particulate matter that settles if the wastewater is left undisturbed. BOD represents the amount of oxygen that would be depleted from the water if the waste were allowed to remain in the water and degrade. TSS and BOD are typically measured in milligrams per liter or pounds per day (ppd).

The existing flows and loads are estimated from the current treatment plant records. The design flows and loads are projected from the current values based on increase in population. Other factors are also considered, including sewer rehabilitation efforts and rainfall statistics. The current and design flows and loads are presented in Table 1-2.

Table 1-2. Wastewater Flows and Loads

Item	Current value	Design value
Flow		
Average dry weather, mgd	0.7	1.9
Peak wet weather, mgd	3.6	6.9
BOD		
Average, ppd	1,900	5,300
Maximum month, ppd	2,500	7,000
TSS		
Average, ppd	1,350	3,800
Maximum month, ppd	1,700	4,800

WASTEWATER TREATMENT ALTERNATIVES

Major improvements to the existing wastewater system are necessary to treat the flows and loads projected over the next 20 years. Several alternatives were developed and evaluated to develop the program best suited to the city's needs.

ALTERNATIVE DEVELOPMENT

Numerous alternatives were considered initially to ensure that all suitable processes would be evaluated. Many of the alternatives were screened out using such criteria as economics, reliability, public acceptance, and ease of implementation. The remaining alternatives were evaluated in detail.

Liquid Stream Alternatives

The three liquid stream alternatives evaluated in detail were:

- activated sludge
- trickling filter/solids contact (TF/SC)
- sequencing batch reactor (SBR).

Site plans, design data tables, and budgetary costs were developed for each alternative. All three alternatives would utilize similar preliminary treatment at the head end of the plant: screening of larger debris and removal of grit. Each alternative would also include ultraviolet disinfection of the effluent. The biological, or secondary, portion of the treatment differs for each alternative. The alternatives are described briefly below.

Activated Sludge. This alternative utilizes the same process currently used at the treatment plant. In this process, the wastewater is aerated in large tanks with a high concentration of microorganisms that break down the sewage constituents. It is the most commonly used process for wastewater treatment in the United States, owing to its simplicity, reliability, and flexibility.

TF/SC. In this alternative, the wastewater is pumped over a high structure filled with plastic honeycomb media. As the wastewater trickles down through the media, microorganisms attached to the media break down the sewage. Further treatment is provided by a small aeration basin similar to that in the activated sludge process, only much smaller. The TF/SC is the most stable and energy efficient of the alternatives. However, it is less flexible than activated sludge in that the entire filter, designed for peak loads 20 years in the future, must be used even at the lighter initial loads. Operating in this lightly loaded condition could result in less effective treatment.

SBR. This alternative is a batch process in which biological treatment and final clarification take place in one tank at separate times during a cycle. The biological treatment is similar to activated sludge; the wastewater is aerated in a large tank with diffused air. The clarified effluent is decanted from the top of the same tank in a batches during a quiescent part of the cycle. This process has not been widely used until recently because it requires a complex control system to time the events that occur during each cycle. With the advent of computers, the control systems have become more practical. The SBR process consumes the most energy of the alternatives because the wastewater is aerated for a longer period. The process is flexible in operation because the cycle timing can be adjusted to meet differing conditions. However, it is inflexible with respect to future expansion because an additional full-sized tank must be added when expansion is required.

Solids Handling Options

The solids removed from the wastewater stream form sludge that must be treated further before disposal. Treated sludge is often referred to as biosolids. Biosolids can be classified as Class A or Class B. Class B biosolids receive some treatment and stabilization, but still contain substantial numbers of pathogens. The existing treatment plant currently produces Class B biosolids. Class A biosolids receive additional treatment that reduces the number of pathogens to a safe level. Class A biosolids provide greater flexibility in disposal because there is little restriction on their use or disposal. However, Class A biosolids are more costly to produce than are Class B biosolids. Options were developed for producing both Class A and Class B biosolids.

Four options were developed for detailed evaluation. These are:

- Autothermal thermophilic aerobic digestion (ATAD) with dewatering of digested sludge.
- Anaerobic digestion with dewatering of digested sludge.
- Anaerobic digestion with dewatering and composting of digested sludge.
- Anaerobic digestion with facultative sludge lagoon (FSL) storage.

Major equipment requirements, land requirements, and budgetary costs were developed for each option. The options are described briefly below.

ATAD With Dewatering. This process produces Class A biosolids. In this process, sludge is digested aerobically (in the presence of oxygen) at high temperatures (about 140 degrees F). No external heating is required; the biological process produces enough heat to maintain the required temperature in the insulated tanks. A large amount of energy is consumed in providing the air for the process. There is a high potential for odor from the digestion process and from the finished product. Dewatering the digested sludge would increase the solids content from about 2 percent to 20 percent, as well as reducing the odor potential of the final product.

Anaerobic Digestion With Dewatering. This process produces Class B biosolids. In this process, sludge is digested anaerobically (in the absence of oxygen) at medium temperature (about 100 degrees F). External heating is required; however, no external energy is consumed because the methane gas produced by the process is used to generate the heat. Anaerobic digestion is the process currently used for sludge treatment at the plant. Dewatering increases the solids content to about 20 percent, reducing the volume of sludge to haul.

Anaerobic Digestion With Dewatering And Composting. This process is similar to that above, except that the final product is composted to produce Class A biosolids. This process would provide the highest quality product. Composting produces substantial odors, but would take place at a remote site with sufficient buffer.

Anaerobic Digestion With FSL. In this option, the sludge is digested anaerobically and then hauled as a liquid to an FSL for long term storage. An FSL is a lagoon in which the top portion is maintained aerobic from oxygen produced by algae while the lower portion containing the sludge is anaerobic. The aerobic cap prevents odors from developing. The FSL provides long term storage of sludge, allowing flexibility in disposal. A dredge is used to remove sludge from the FSL for application on land.

Collection System

A computer simulation was performed using a model of the collection system under current and future flow conditions. From the results of the simulation, one alternative was developed for improving the system to meet the needs in the design year. The improvements include a new interceptor from the north end of the study area to the treatment plant. The northern section of the pipeline would include two new pump stations. A new pump station at the treatment plant would also be required to lift the flow from the gravity interceptor into the headworks of the plant. Existing sections of piping that are structurally deficient would be replaced to reduce the amount of infiltration into the system.

ALTERNATIVE EVALUATION

The treatment alternatives were evaluated and ranked on the basis of economic and non-economic criteria. The ranking was used in selecting the recommended plan.

Liquid Stream Alternatives

The capital, annual, and present worth costs of the three alternatives are summarized in Table 1-3. These costs include a 15 percent contingency, but do not include costs for engineering and contract administration. As the table shows, SBR has the lowest capital cost and total present worth, but the cost differences among the alternatives are nearly insignificant within the accuracy of the cost estimate. Because the costs are so similar, non-economic factors play a more significant role in alternative selection.

Table 1-3. Cost Comparison of Treatment Alternatives

	Alternative		
Cost item, $1,000	**Activated sludge**	**TF/SC**	**SBR**
Capital cost	9,963	10,069	9,365
Annual cost	448	383	435
Present worth of annual cost[a]	4,394	3,755	4,271
Total present worth[a]	14,357	13,824	13,636

Notes: [a]Present worth based on discount rate of 8 percent and study period of 20 years.

The ranking of the alternatives based on economic and non-economic factors is summarized in Table 1-4. From this table it is clear that the activated sludge alternative is favored in most respects. Therefore, the activated sludge alternative was selected for the recommended plan.

Table 1-4. Summary of Treatment Alternative Rankings

	Alternative Ranking		
Criteria	**A/S**	**TF/SC**	**SBR**
Environmental impact	1	2	3
Reliability	1	1	2
Flexibility in expansion	1	3	2
Flexibility in operation	1	2	1
Aesthetics	1	2	3
Economics	2	1	1

Solids Handling Options

The capital, annual, and present worth costs of the four options are summarized in Table 1-5. The costs of land for sludge processing and land application are included. These costs also include a 15 percent contingency, but do not include costs for engineering and contract administration. As the table shows, the option of anaerobic digestion with FSL storage has the lowest cost. Dewatering could be competitive if sludge hauling distances were greater than 60 miles. It is assumed that sludge application sites will be found within 10 to 20 miles.

Table 1-5. Cost Comparison of Solids Handling Options

Cost item, $1,000	Option			
	ATAD	Dewatering	Composting	FSL
Construction cost	3,839	4,087	4,006	3,029
Annual cost	116	88	137	110
Present worth of annual cost[a]	1,140	865	1,341	1,082
Total present worth[a]	4,979	4,952	5,347	4,111

Notes: [a]Present worth based on discount rate of 8 percent and study period of 20 years.

The ranking of the options based on economic and non-economic factors is summarized in Table 1-6. The FSL option is ranked the highest in most categories. Because the future conditions and land availability are unclear, flexibility is a particularly important factor. The FSL is the highest ranked option in this category. The FSL option was selected for the recommended plan.

Table 1-6. Summary of Solids Handling Option Rankings

Criteria	Alternative ranking			
	ATAD	Dewatering	Composting	FSL
Environmental impact	2	1	1	2
Ease of implementation	3	2	2	1
Reliability	3	1	2	1
Flexibility	3	2	1	1
Aesthetics	3	1	2	2
Economics	3	2	4	1

RECOMMENDED PLAN

The recommended plan includes major improvements to the treatment plant and the collection system. These improvements are summarized below.

TREATMENT PLANT

The treatment plant requires improvements to both the liquid stream treatment and solids handling processes. Most of the existing unit processes will be entirely replaced.

Liquid Stream Treatment

As discussed in the alternative evaluation above, the recommended alternative for the new treatment plant utilizes the activated sludge process. This alternative provides a reliable system using a process familiar to the operators. The process provides the flexibility needed to handle the wide variation in flows and loads expected over the next 20 years. It also provides flexibility in future expansion.

A site plan of the recommended treatment plant improvements is shown in Figure 1-1. An artist's rendition of the recommended treatment plant is shown on Figure 1-2. Units for future expansion are shown in dashed lines on the site plan. Not all the processes shown for the future would be used; they are shown to illustrate the flexibility in expansion. For example, the aeration basins could be expanded by adding another full-sized tank. Alternatively, primary clarifiers could be added, reducing the load on the aeration basins by about 30 percent. Or primary clarifiers and a trickling filter could be added, possibly eliminating the need for more aeration basins.

Solids Handling

The recommended plan includes upgrading the existing anaerobic digester, adding a second digester, and constructing an FSL at a remote site. Figure 1-3 shows a typical FSL site. Liquid digested sludge can be hauled directly from the digester for land application, or hauled to the FSL for storage until conditions are appropriate for land application. About 150 acres of land will be required to implement this plan. The ideal site would be large enough to accommodate both the FSL and the sludge application on one site. The city should pursue land acquisition as soon as possible.

COLLECTION SYSTEM

Collection system improvements include a new 5.5-mile-long interceptor. At the upper end, along Heceta Beach Road, the pipeline would consist of a 12-inch diameter pressure main. Two pump stations would be required. The pipeline would consist of an 18-inch diameter gravity sewer running south along Oak Street to the airport property. At 31st Street, flow would be diverted from the existing collection system to relieve the overloaded Ivy Street pump station. A 24-inch diameter gravity sewer would carry the flow from this point to the treatment plant.

CAPITAL COSTS

The estimated capital costs for the complete recommended project are summarized in Table 1-7. The table includes the costs for the recommended land acquisition, collection system improvements, and allied costs for engineering and contract administration.

SCHEDULE

The Mutual Agreement and Order (MAO) with the Oregon Department of Environmental Quality (DEQ) stipulates a schedule for the completion of the wastewater system improvements. Based on that schedule, it is expected that plans and specifications for the improvements will be complete by the first of 1999. Construction is expected to take about 16 months, resulting in completion in the spring of 2000. Compliance should be achieved by the late summer of 2000. Most of the recommended improvements will be completed in this first phase. Some portions, particularly in the collection system, can be deferred as discussed in the next section.

Table 1-7. Estimated Capital Costs for Recommended Plan

Item	Costs, $1,000
Liquid stream treatment	
Contractor indirects	469
Influent pumping	368
Yard development	384
Headworks	773
Odor control	237
Aeration basins	866
Blower building	628
Secondary clarifiers	1,381
Yard piping	341
Electrical/instrumentation	1,680
Disinfection	692
Outfall	558
Operations building	287
Subtotal, treatment plant	8,664
Solids Handling	
Anaerobic digestion	1,483
Tank truck	100
FSL	460
Dredge	50
Access road	100
Supernatant irrigation system	50
Subtotal, solids handling	2,243
Collection system	
Gravity interceptor	1,497
Force mains	493
Pump stations	150
Subtotal, collection system	2,140
Subtotal, total project	13,047
Bond at 1 percent	130
Contingency at 15 percent	1,957
Subtotal	15,135
Engineering, admin. at 20 percent	3,027
Subtotal	18,161
Land	450
Total project cost	18,611

PHASING OPPORTUNITIES

Phasing the construction could allow some costs to be deferred to the future. Because phasing incurs costs associated with multiple design and construction contracts, additional mobilization, and loss of economy of scale, an item should be deferred about 10 years to make phasing worthwhile. An exception would be individual pieces of mechanical equipment such as a blower or pump; these items would be worth deferring even a few years.

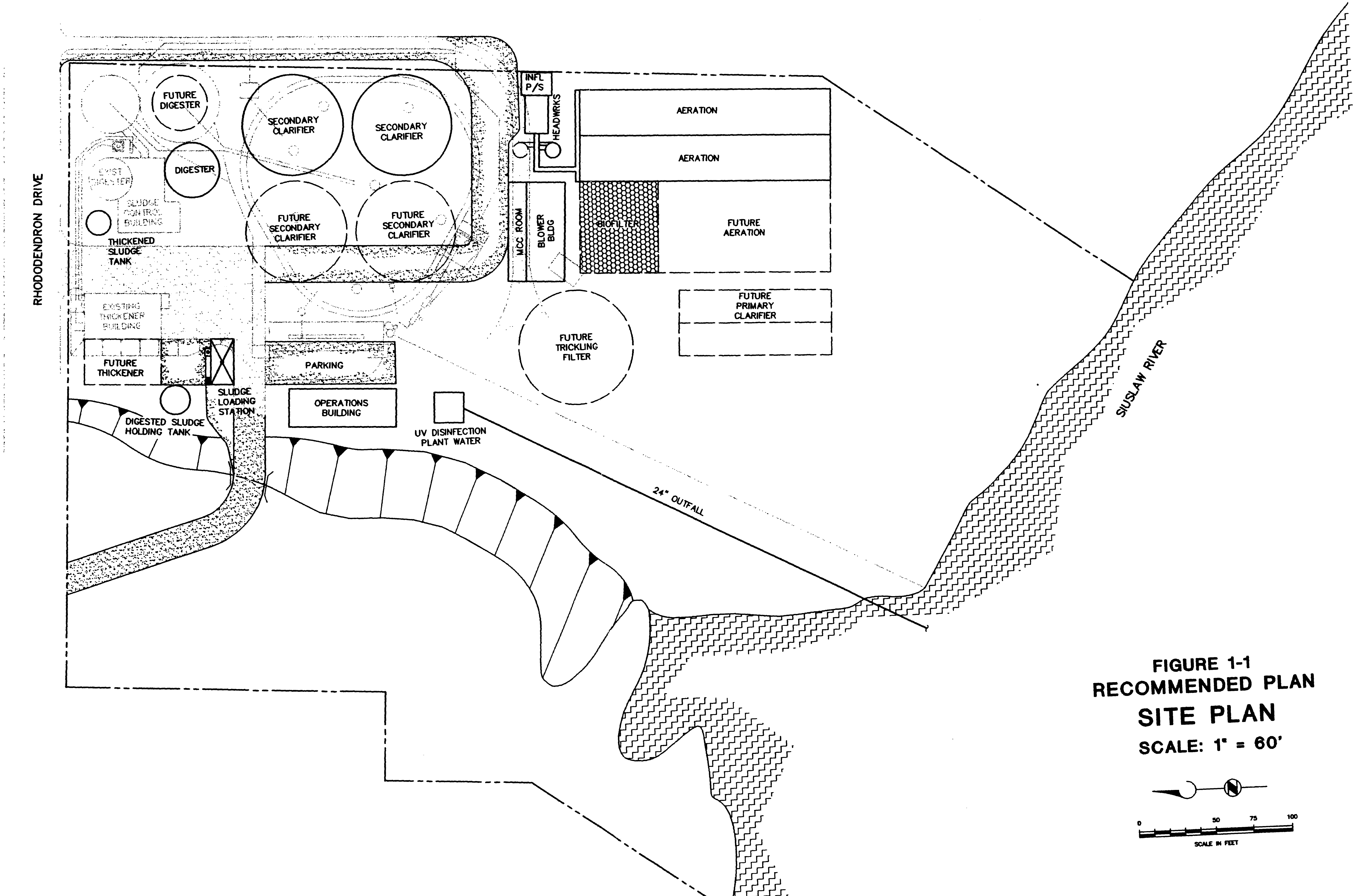

FIGURE 1-1
RECOMMENDED PLAN
SITE PLAN
SCALE: 1" = 60'

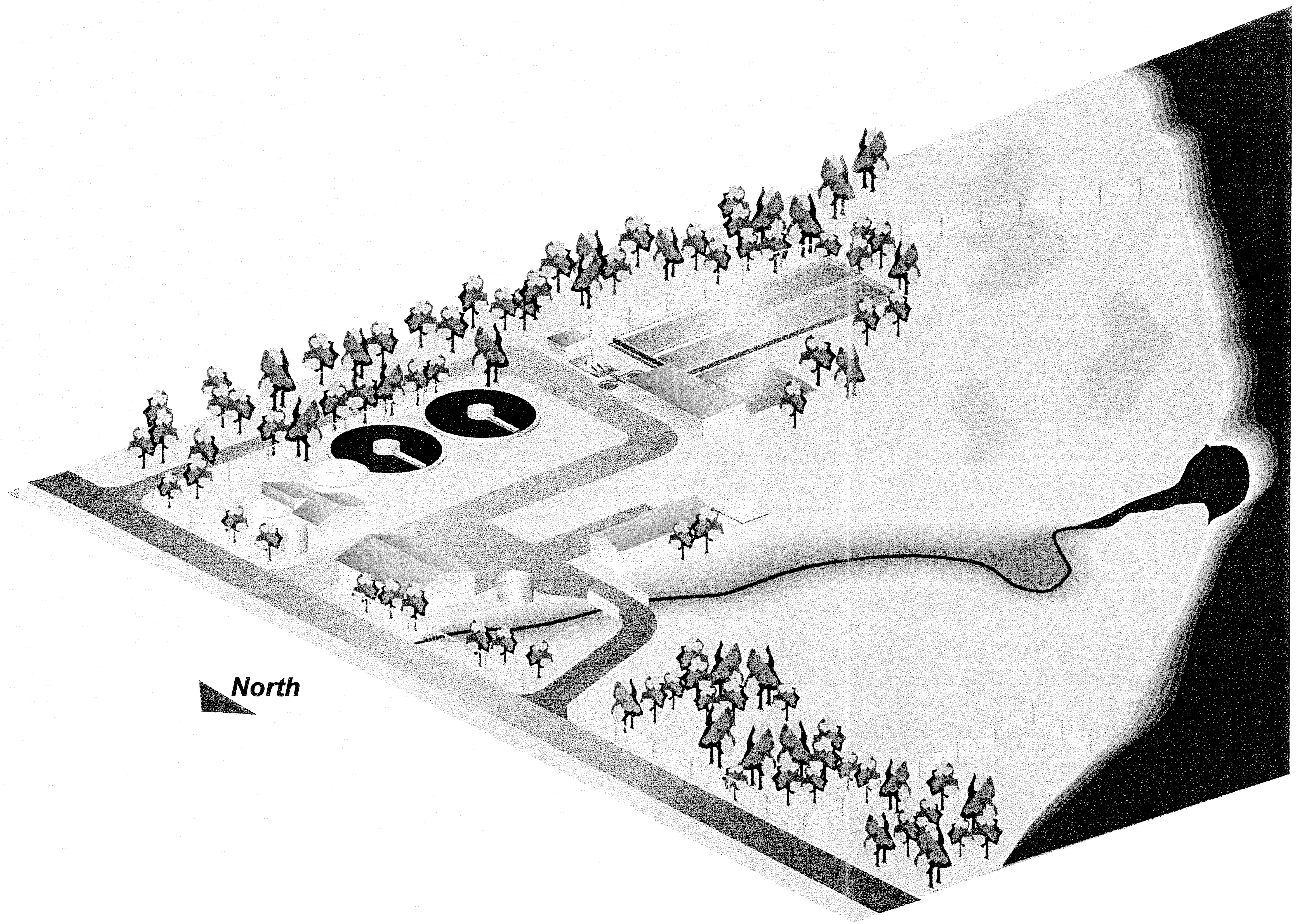

FIGURE 1-2
ARTIST'S RENDITION OF
RECOMMENDED PLAN

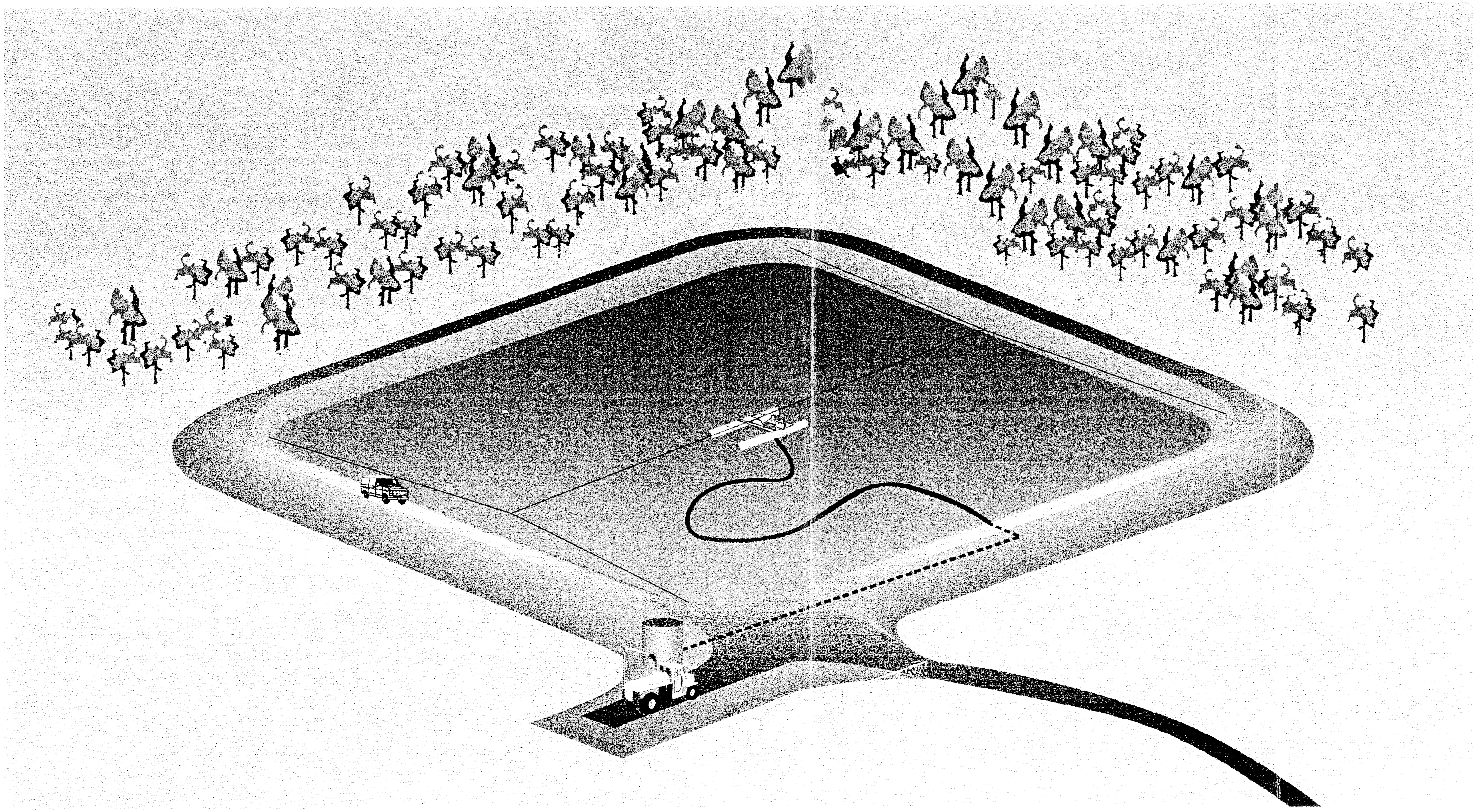

FIGURE 1-3
ARTIST'S RENDITION OF
TYPICAL FSL SITE

Components of this project that may have phasing potential are discussed briefly below.

- Collection system. The upper portions of the new interceptor, including the pumping stations and force mains and portions of the gravity sewer will not be necessary until those areas are developed. At this time, only the portion between the treatment plant and 8th Street, which provides relief to the Ivy Street pump station, is necessary.
- Influent pumping. It may be possible to provide two pumps now and add the third later.
- Aeration. Four blowers will not be necessary for several years. Two or three would be sufficient at first. Likewise, some of the diffusers can be installed in the future. Although the aeration basins would have excess capacity at first, it is unlikely that phasing the construction of the basins would be worthwhile. Adding on to the basins would represent a major project with significant mobilization costs and potential disruption to plant operation.
- Disinfection. Although the entire structure would be built initially, some of the actual UV modules could be installed later.

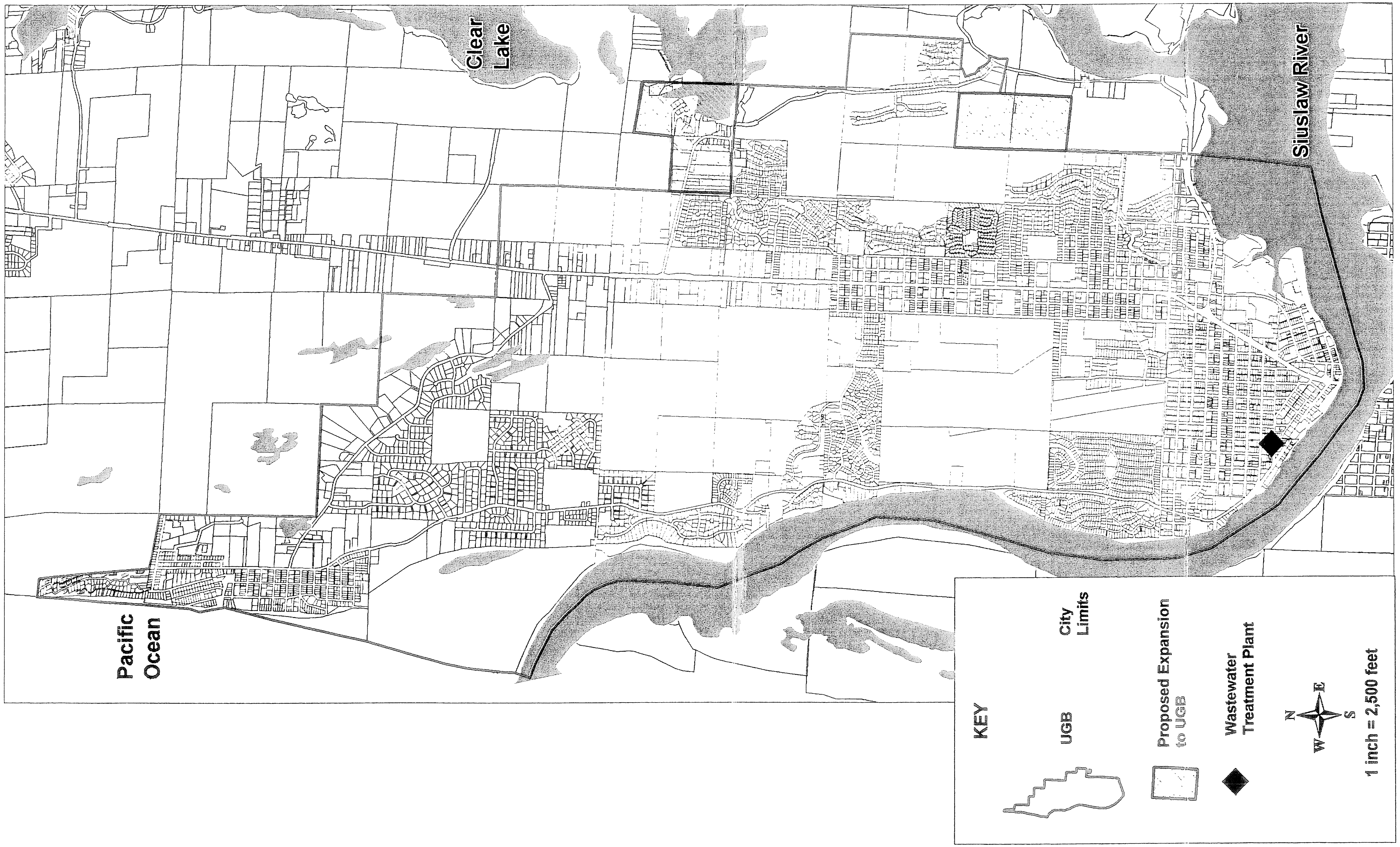

Figure 2-1. Florence Wastewater Study Area

CHAPTER 2

STUDY AREA CHARACTERISTICS

Development of a sound, long-range wastewater management plan for the Florence area requires consideration of both natural and socioeconomic environmental characteristics. The natural environment, including topography, geology, soils, climate, and water resources, affects any wastewater treatment alternative. Factors such as land use, population, and irrigation practices affect the area's natural resources and further affect the availability of land for wastewater treatment and disposal. In this chapter, the study area is defined and the characteristics of both its physical and economic environment are examined.

SEWERAGE STUDY AREA

The City of Florence is situated along the north bank of the Siuslaw River on the central Oregon coast. The city is located in the southern third of the western edge of Lane County. The study area for the facilities plan encompasses the proposed Florence Urban Growth Boundary (UGB). The UGB is currently under review for updating. It is expected to remain essentially unchanged except for minor modifications discussed later in this chapter. Figure 2-1 shows the wastewater facility study area (proposed UGB). The current UGB encompasses about 5,400 acres. As can be seen from the figure, geographic barriers (Siuslaw River and Pacific Ocean) preclude development to the south and west. Development is also somewhat limited to the east by lakes, the drinking water supply basin, and steep contours of the Coast Range foothills. Most development is expected to occur to the north.

PLANNING PERIOD

The facilities planning period must be long enough to allow the city to develop and pursue a long-range program. Key limits to the planning period are the precision of population projections and the ability to estimate industrial and commercial growth. A 20-year planning period is typically used in facilities plans. The start of the period is assumed to be the year that the facilities are first put into operation. For this study, the planning period is 20 years, from the year 2000 through 2020.

PHYSICAL ENVIRONMENT

The physical environment includes the topography, geology, soils, climate, and water resources of the region. This section presents a brief discussion of these items as they relate to the sewerage planning program.