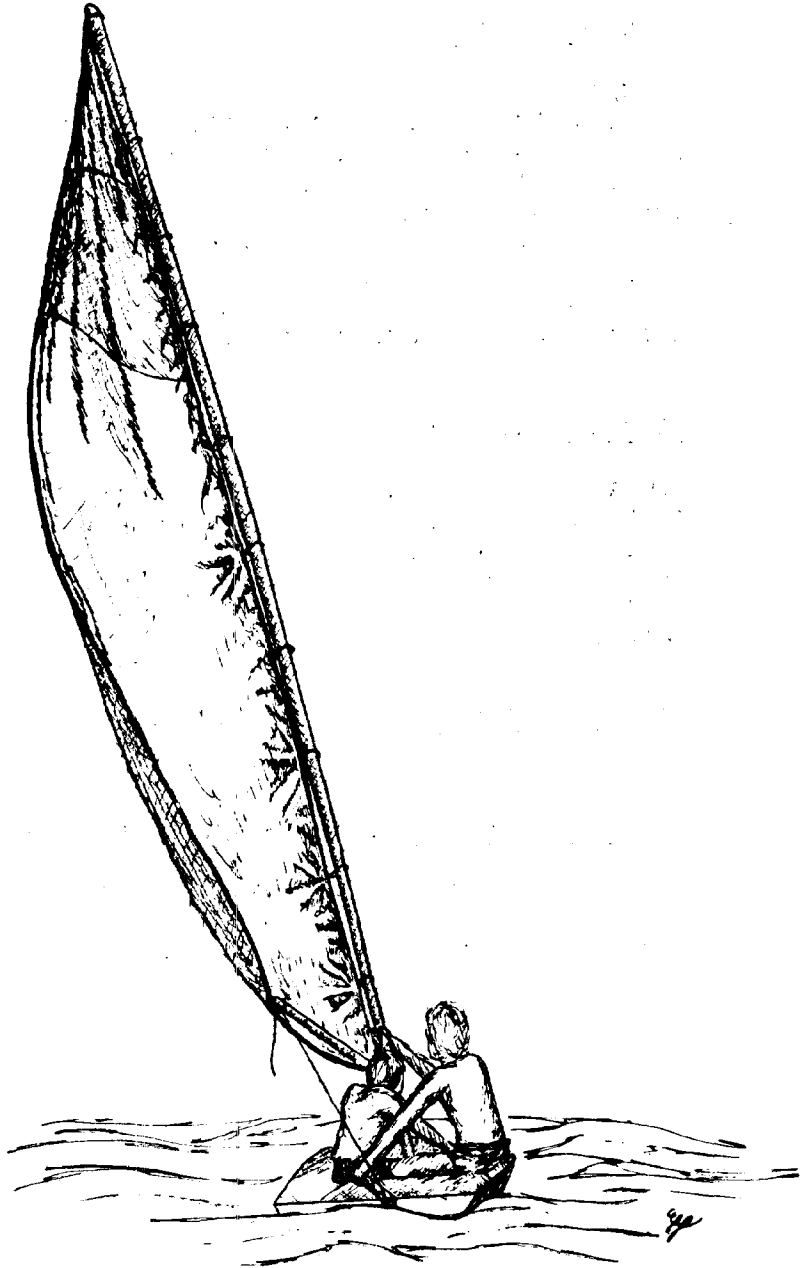


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1980



MARINA ACCESS STUDY

HAMMOND, INDIANA

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HAMMOND MARINA ACCESS STUDY

FINAL REPORT

AUGUST, 1980

CITY OF HAMMOND/
HUGHES ASSOCIATES

PROJECT INDIANA CZ084-80-04

The preparation of this report was financed in part through a comprehensive planning grant provided by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration.

HAMMOND MARINA ACCESS STUDY
Final Report

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HAMMOND MARINA ACCESS STUDY
Final Report

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HAMMOND MARINA ACCESS STUDY

Final Report

INTRODUCTION

The Lake County Park and Recreation Board has proposed the development of a 200-600 boat marina to be located on the Lake Michigan Shore of the City of Hammond.

One of the major concerns of the City of Hammond is providing access to the site which is safe and convenient for Marina users and which produces a minimum of disruption of existing traffic patterns in the area and existing commercial, industrial and residential uses in the area.

The overall purpose of the study is to:

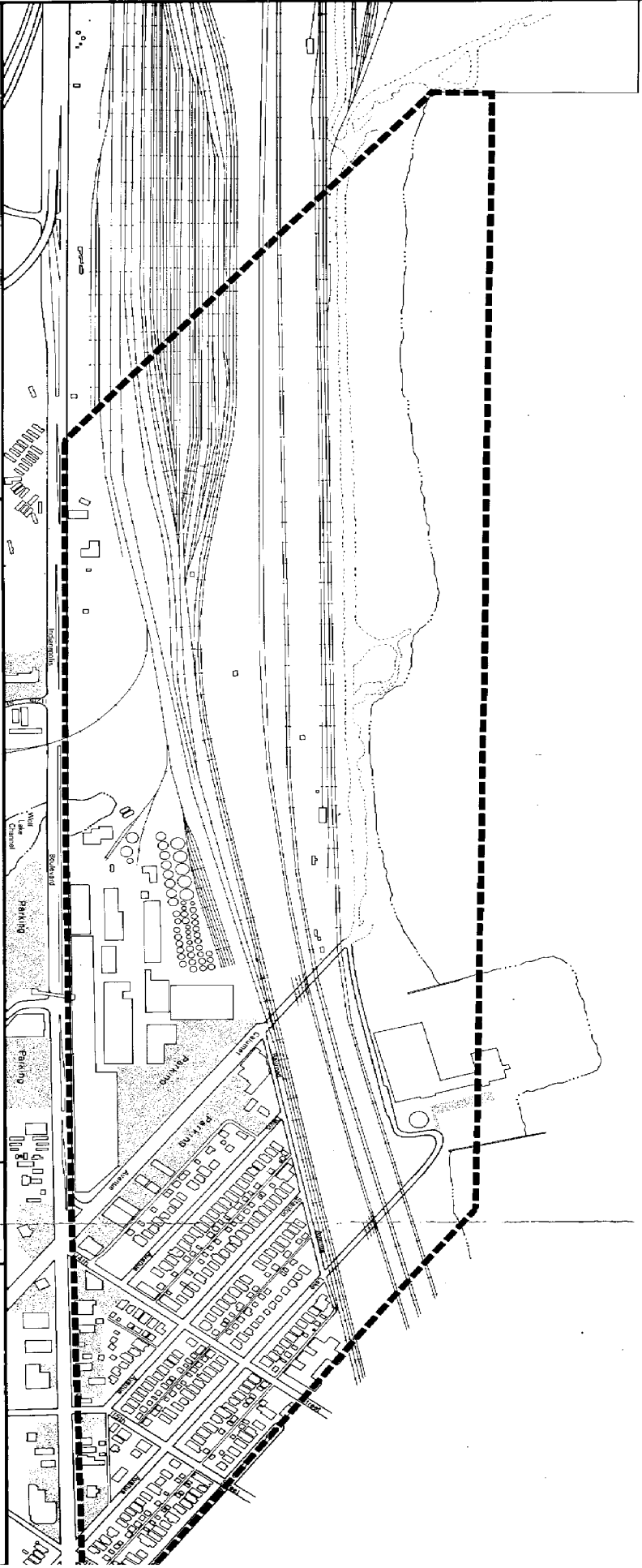
1. Identify the essential characteristics of an adequate access facility in terms of capacity and safety;
2. Identify and quantify constraints to safe and convenient access including existing and projected automobile and rail movements in the area;
3. Determine how existing or future area land uses will affect or be affected by Marina access;
4. Identify and evaluate potential access corridors and facility designs in terms of economic and social costs and the Marina's access requirement;
5. Identify other actions required to minimize conflict between Marina access and area development and transportation.

The principal focus of the study, the "planning area", includes the area south of the lake shore to Indianapolis Boulevard from the Commonwealth Edison plant on the west to approximately 600 feet east of the Hammond Water Works plant. (See Figure 1)

The report is organized into three major sections covering Access Requirements and Constraints, Land Use and other physical characteristics of the area, and Analysis and Recommendations regarding corridors and facilities.

These report sections correspond to preliminary reports dealing with each of these areas.

Lake Michigan



HAMMOND MARINA ACCESS STUDY

PROJECT NUMBER: 2208-8010 - THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COMPREHENSIVE OFFICE OF GREAT LAKES MANAGEMENT AND OCEANIC AND ESTUARINE SCIENTIFIC ADMINISTRATION.

PLANNING AREA



north

CITY OF HAMMOND
Department of Planning
and Development /
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ACCESS REQUIREMENTS AND CONSTRAINTS

The purpose of this study phase was to develop estimates of traffic to be generated by the Marina and other uses in the area, determine access corridor capacity requirements, and identify potential conflicts with other vehicular and rail traffic in the area. All traffic estimates, projection and analysis relate to summer months when Marina use will be at its peak.

TRAFFIC

Since Indianapolis Boulevard is the arterial closest to the lake shore and Marina site, the focus of concern with traffic generation was the area between Indianapolis Boulevard and the lake shore. The area is split by E.J. & E., B. & O., and Conrail rail lines. Only Calumet Avenue and Lake Avenue currently provide public access to the lake front across these rail lines.

If either Calumet or Lake Avenues were to be used for Marina access, they would have to accommodate existing generators north and south of the rail lines as well as the Marina. An entirely new access corridor could be designed to serve only the Marina and other uses north of the rail lines. The three types or areas of traffic generation of concern then are the Marina, other uses north of the rail lines (including existing recreational uses and uses associated with the railroads themselves) and

uses south of the rail lines to Indianapolis Boulevard.

Projected Marina traffic was estimated for two schemes which correspond to the two stages of planned development outlines in the March, 1976 Lakeshore Park and Marina Master Plan prepared by Ralph H. Burke Associates.

The first stage of development would include 300 boat slips, 54 moorings and parking for 390 cars. The first stage would also include 8 launch ramps with parking for 256 car/trailer combinations. Under the second phase of development, the 54 moorings would be replaced with 300 additional slips and parking for the slips would be expanded to 600 spaces.

Based on traffic generation data for other marinas, it is expected that each slip (or mooring) will generate an average of 3.8 trips on peak days (Sundays and Holidays during summer months), 2.3 trips on Saturdays and 1.1 trips on weekdays. Based on the Burke report, each launch ramp could be expected to generate 36 trips per day or a total of 288 trips per day for the 8 ramps.

Based on the above mentioned factors, the total peak day average daily traffic (ADT) generated by the Marina would be 1,633 for Stage I and 2,568 for Stage II.

National studies of marina use* indicate that Sundays and Holidays would be the peak days of use and that peak use within the day would occur between 6:00 and 10:00 A. M. and 3:00 and 6:00 P. M.

Peak hour traffic from the Marina is estimated at 236 for Stage I and 344 for Stage II. These estimates are based on projections that the slips will generate trips (in the major direction of flow) equal to 40 percent of parking for slips and a projected peak of 10 launches/retrievals per hour/per ramp.

For the purposes of this study, Saturday traffic was estimated at 60 percent and weekdays at 30 percent of daily and hourly peaks. Table 1 shows a summary of expected peak and average daily traffic for peak and off-peak days.

Projected Traffic Volumes
Hammond Marina

Table 1

	<u>S T A G E I</u>		<u>S T A G E II</u>	
	<u>ADT</u>	<u>Peak Hour</u>	<u>ADT</u>	<u>Peak Hour</u>
Sundays/Holidays	1,633	236	2,568	344
Saturdays	980	142	1,541	206
Weekdays	490	71	770	103

Source: Hughes Associates

* Institute of Traffic Engineers, Traffic Generation Manual

According to the Hammond Rail Relocation Study (Alfred Benesch and Co.), current and projected average daily traffic across rail lines at both Calumet and Lake Avenues was 300. This traffic would include trips to and from the Hammond Water Works plant, trips to railroad facilities as well as some recreation oriented trips. While detailed data is not available for these crossings from the Rail Relocation Study, the Study in general assumed that Saturdays and Sundays together would be approximately 125 percent of weekday ADT with Sunday at 65 percent and Saturday at 60 percent of weekday ADT. It is estimated that peak hour traffic will be 15 percent of ADT. Table 2 summarizes estimated base line traffic generated north of the rail lines in the study area.

Estimated Traffic Volumes
Lakeshore/Rail Corridor
Calumet and Lake Avenues

Table 2

	<u>ADT</u>	<u>Peak Hour</u>
Sundays/Holidays	195	29
Saturdays	180	27
Weekdays	300	45

Source: Hughes Associates

The third element of traffic generation in the study area involves segments of existing streets between Indianapolis Boulevard and the rail lines. These include generators along Lake and Calumet Avenues.

Table 3 shows a summary of projected traffic on the Lake Avenue corridor, combining Lake Avenue generators with the Marina and other lake shore/railroad generators.

Table 3 shows that peak daily traffic will occur on Sunday and that peak hourly traffic will occur between 3:00 and 7:00 P. M. on Sunday. These peaks will be more than six times normal Sunday traffic at the Lake/Indianapolis Boulevard intersection, due to the addition of Marina traffic.

Summary of Traffic Generators
Lake Avenue Corridor
Hammond Marina Access

Table 3

<u>Source</u>	<u>Weekday</u>	<u>Saturday</u>	<u>Sunday/Holiday</u>
	<u>ADT/Peak (Hours)</u>	<u>ADT/Peak (Hours)</u>	<u>ADT/Peak (Hours)</u>
Marina-Stage I & II	770/103 (4-7 pm)	1,541/206 (4-7 pm)	2,568/344 (3-6 pm)
Other Lake Shore/ Railroads	300/ 45 (4-7 pm)	180/ 27 (4-7 pm)	195/ 29 (4-7 pm)
Subtotal at Railroad Crossing	1,070/148 (4-7 pm)	1,721/233 (4-7 pm)	2,763/373 (3-7 pm)
Lake Avenue-Indianapolis to Railroad	368/ 44 (4-7 pm)	368/ 44 (4-7 pm)	321/ 39 (4-7 pm)
Combined at Lake Avenue & Indianapolis	1,438/192 (4-7 pm)	2,089/277 (4-7 pm)	3,084/412 (3-7 pm)

Source: Hughes Associates

Uses along Calumet Avenue include residential (multi-family), industrial and commercial. Lever Brothers' truck loading docks and employee gate are the only uses

on the west side of Calumet. Uses on the east side of Calumet include (from north to south) Phil Schmidt's Restaurant, two 24 unit apartment buildings, a social club, a muffler shop, and tavern with two apartments above at Calumet and Indianapolis.

The Lever Brothers facility has two gates which serve a loading dock and a pedestrian gate for employees. The loading dock has 28 bays with additional parking for an estimated 20 truck trailers. At the time of the field surveys, a major construction project was under way and an estimated 25 construction trailers were parked on the site.

Employee parking for Lever Brothers was provided on the east side of Calumet in two lots, the larger accommodating approximately 100 cars and the smaller (shared with the Calumet Social Club) accommodating approximately 40 cars. On street, head-in parking on the west side of Calumet provides space for approximately 85 additional cars. Lever Brothers has recently constructed an enclosed pedestrian bridge to a 600 car employee parking lot located on the south side of Indianapolis Boulevard.

The company's traffic manager indicates that there are approximately 60 trucks in and out of the area on weekdays for an average ADT of 120. Trucking operations are

virtually closed down on Saturdays and Sundays. Lever Brothers' employee parking off Calumet is estimated to generate weekday ADT of 600. Management indicated little activity on Saturday and Sunday -- we estimated Saturday ADT at 20 percent (120) and Sunday ADT at 10 percent (60). Peak hours were estimated at 30 percent of ADT or 18 for Sunday, 36 for Saturday, and 180 for weekdays. Management indicates that it is encouraging employees to use its 600 car parking lot south of Indianapolis Boulevard rather than Calumet Avenue facilities. This action is expected to help further reduce any future congestion on Calumet.

Phil Schmidt's Restaurant has a seating capacity of approximately 500, off-street parking for approximately 130 cars and approximately 20 on-street parking spaces. Phil Schmidt's Restaurant is closed Sundays and Holidays and there are no plans for changing the current operation.

The two 24 unit apartment buildings share a parking lot which would accommodate approximately 26 cars and on-street parking for approximately 6 cars.

The Calumet Social Club is a private dance hall. Management indicates that the hall is used only on Saturday nights and has a capacity of 250 to 300 persons. The Club has parking for 6 cars on-street and approximately 40 cars off-street (shared lot with Lever Brothers).

The next use south on the east side of Calumet is a Car X Muffler shop which is currently under construction. It appears that this use will have eight bays and parking for approximately 16 cars.

The tavern/apartment use at Indianapolis and Calumet provides off-street parking for approximately eight cars with access to Calumet.

Taken together, it is estimated that these Calumet Avenue uses would generate ADT's of 1,700 for weekdays, 1,600 for Saturdays, and 350 for Sundays. Weekday peak traffic is estimated at 250 per hour and is expected to occur between 4:00 and 7:00 P. M. Saturday peak traffic is estimated at 355 and is expected to occur between 7:00 and 9:00 P. M. Sunday peak is estimated at 55 between 4:00 and 7:00 P. M.

Table 4 shows a summary of average daily and peak hour traffic volumes for the Calumet Avenue corridor based on development of both stages of the Marina. Time periods in parenthesis indicate when the peak hour traffic could be expected to occur. ADT and peak hour traffic are shown both for the rail crossing and for the intersection of Calumet Avenue with Indianapolis Boulevard. While ADT's from each segment were added to obtain combined ADT, combined peak hour traffic totals only those segments which coincide plus estimated off-peak traffic from remaining segments.

Summary of Traffic Generators
 Calumet Avenue Corridor
 Hammond Marina Access

Table 4

<u>Source</u>	<u>Weekday</u>	<u>Saturday</u>	<u>Sunday/Holiday</u>
	<u>ADT/Peak (Hours)</u>	<u>ADT/Peak (Hours)</u>	<u>ADT/Peak (Hours)</u>
Marina Stage I & II	770/103 (4-7 pm)	1,541/206 (4-7 pm)	2,568/344 (3-6 pm)
Other Lake Shore	300/ 45 (4-7 pm)	180/ 27 (4-7 pm)	195/ 29 (4-7 pm)
Subtotal at RR Crossing	1,070/148 (4-7 pm)	1,721/233 (4-7 pm)	2,763/373 (3-7 pm)
Calumet-Indiana- polis to RR	1,700/250 (4-7 pm)	1,600/355 (7-9 pm)	350/ 55 (4-7 pm)
Combined at Calumet/ Indianapolis	2,770/398 (4-7 pm)	3,321/388 (7-9 pm)	3,113/428 (3-7 pm)

Source: Hughes Associates

Table 4 shows that while Saturday will have the highest ADT, peak hourly traffic (because of the Marina) is expected to occur on Sunday afternoon. It is expected that this traffic will be split, 383 southbound and 45 northbound, during the 3-7 pm peak.

A similar type of summary for a Lake Avenue corridor would involve substituting traffic from the Lake Avenue-Indianapolis to railroad peaks and ADT's (page 6) for the corresponding Calumet Avenue segment. Any other access facility would be required to handle all traffic generated north of the rail lines.

LANE REQUIREMENTS

The Calumet Avenue traffic volumes would be equal to or greater than either the Lake Avenue Corridor or a new corridor providing direct access to the Marina. Lane requirements thus were determined based on the expected peak hour traffic on Calumet. Below is an outline of capacities of various types of facilities at various levels of service compared with the Calumet Avenue projected peak hour volume. The first two comparisons relate to lane requirements along the corridor. The third comparison is used to determine lane requirements at the intersection of the access corridor with Indianapolis Boulevard. Level of Service (L.O.S.) C, D, and E reflect the extent of congestion on a given facility with various levels of traffic. Level "C" is defined as an ideal design capacity and level "E" is considered maximum capacity. In the first example, the ideal maximum level of traffic would be 1,500 autos. As traffic increases, congestion increases, and the level of service drops. The example also shows that capacity or level of service also drops with the addition of truck traffic.

- (1) Free-flow (limited access such as bridges, ramps, etc.)
Capacity at 30-40 MPH, maximum 6 percent grade expressed
in vehicles/hour/lane.)

L.O.S.	Capacity (Vehicles/Hour/Lane)	
	Autos	15% Trucks
C	1,500	1,050
D	1,600	
E	1,875	

Result: A 2-lane bridge, or other limited access facility with 2-way traffic, would be more than adequate for a peak hour traffic of 383 vehicles/hour one way.

(2) Typical at-grade street at 30 MPH + expressed in vehicles/hour/lane.

<u>L.O.S.</u>	<u>Capacity</u>
C	1,200
D	1,350
E	1,500

Result: A 2-lane roadway with 2-way traffic would be more than adequate with a peak hour demand of 383 vehicles/hour one way.

(3) Intersection capacity at traffic signal (4-lane).

<u>L.O.S.</u>	<u>Intersection Capacity</u>	<u>South Bound Approach Capacity</u>	
		<u>1 lane</u>	<u>2 lanes</u>
C	1,200	312	624
D	1,350	351	702
E	1,500	390	780

Result: With the projected peak hour, one-way volume of 383 vehicles, two south bound approach lanes (existing) will be required to provide level of service "C". One lane would provide level of service "E". Two south bound lanes will allow 1.6 times the projected peak hour volume before reaching maximum capacity with present signal

timing. Present signal timing at Calumet/
 Indianapolis gives green to south bound Calumet
 26 percent of the time.

STORAGE REQUIREMENTS

One of the significant access constraints affecting the proposed Hammond Marina is the series of lakeside rail lines which separate the lake shore from the arterial highway system. One aspect of this constraint is the need to "store" vehicles while the railroad crossings are blocked. The rail lines actually consist of nine tracks protected by three sets of gates and flashers. Table 5 shows the number of trains and gross amount of time crossings are closed (down time) by specified time frames.

Train Traffic Table 5
 Calumet/Lake Avenues Combined Crossings, 1977

<u>Time Period</u>	<u>Number of Trains</u>	<u>Gross Down Time (minutes)</u>
6:00 am-9:00 am	12	19
9:00 am-3:00 pm	13	23
3:00 pm-6:00 pm	9	16
6:00 pm-10:00 pm	8	16
10:00 pm-6:00 am	<u>13</u>	<u>29</u>
	55	103

Source: Alfred Benesch & Company

During the 3:00-6:00 P. M. peak period for the Marina and other lake side uses, there are nine trains with 16 minutes of down time. This equals an average of three trains per hour with 1.77 minutes of down time each or 5.3 minutes of down time per hour. Based on the Benesch study, the track crossing approach speed is 20 MPH and crossing roughness forces a speed reduction to 10 MPH.

In order to estimate needed peak storage capacity, the following assumptions were made: (1) that 360 of the 373 (Table 4) peak hour traffic in the rail line to lake shore segment is south bound, (2) that 80 of these vehicles (peak hourly launch ramp capacity) have trailers, and (3) that the average storage length per vehicle (or combination) is 30 feet.

The 360 south bound traffic during the peak hour equals six vehicles per minute. This figure is divided by a 0.85 peak hour factor to arrive at a design volume of 7.06 vehicles per minute. (This "peak hour factor" allows for fluctuations in traffic volumes within the peak hour.) Since the average train generates 1.77 minutes of down time, 12.5 vehicles will be stopped initially (7.06×1.77) requiring 375 feet of vehicle storage ($12.5 \times 30'$). However, before these vehicles can disperse after the tracks clear, another nine vehicles will accumulate for a total of 21.5 vehicles or 645 feet of vehicle storage required. A

similar (though slightly less) storage capacity would be required to accommodate an expected north bound morning secondary peak.

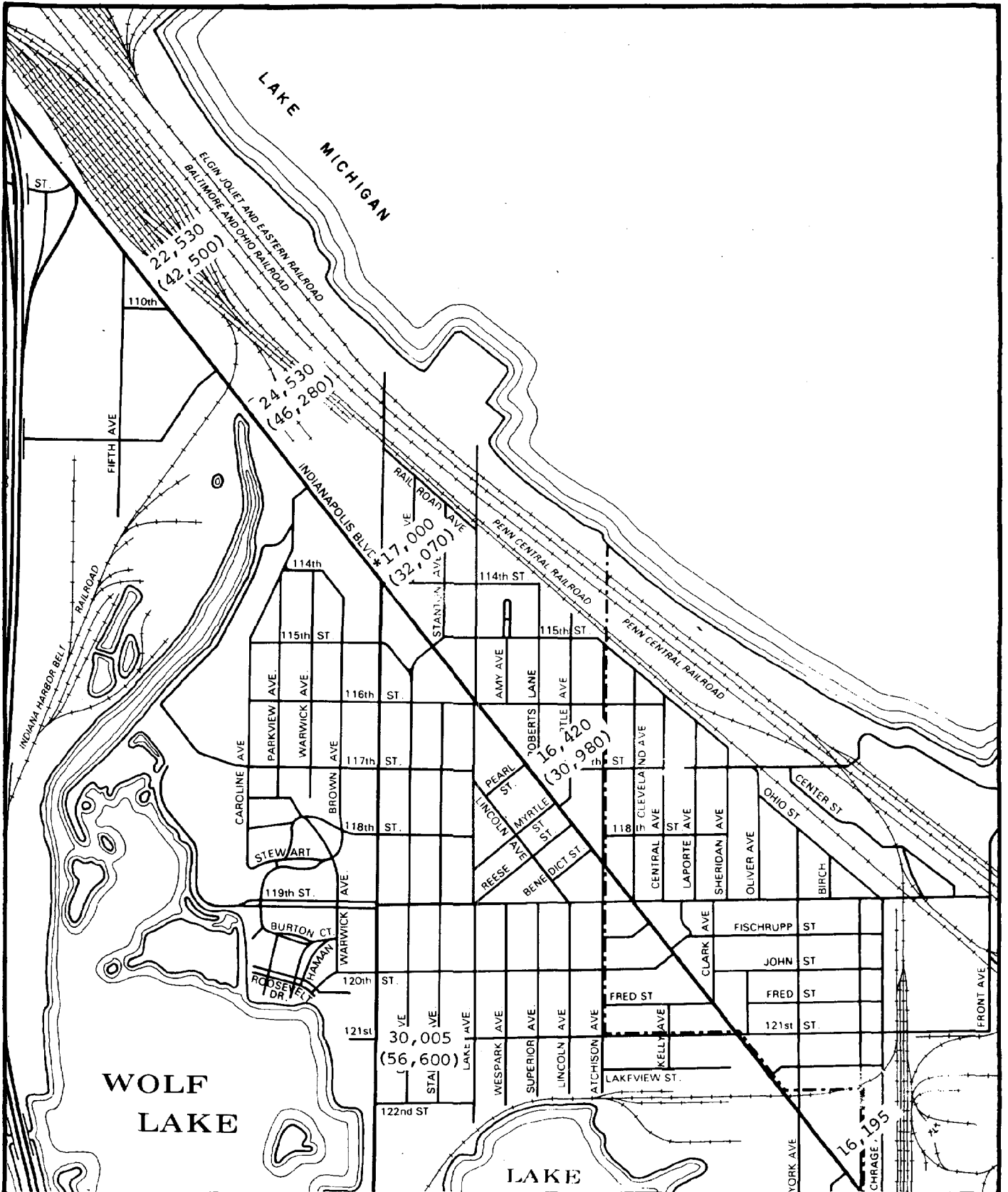
AREA TRANSPORTATION

As indicated earlier, Indianapolis Boulevard is the closest arterial to the proposed Marina site. Calumet Avenue is also an arterial south of its intersection with Indianapolis Boulevard. Figure 2 shows 1978 and projected year 2000 ADT counts for these arterials. (The projected year 2000 counts are based on a multiplier used by the Northwestern Indiana Regional Planning Commission.)

The Northwestern Indiana Regional Planning Commission (NIRPC) 1995 Transportation System Plan (1979) proposed no changes in the area's arterial roads. The Alfred Benesch & Company Hammond Railroad Relocation and Consolidation Plan (1979) proposed no changes in existing rail facilities or traffic in the area.

TRAFFIC IMPACTS

As indicated by a comparison of projected Marina traffic (Table 3) and existing arterial traffic (Figure 2), the additional traffic from the Marina will be relatively minor. Average weekday traffic on arterial roads in the area range from 17,000 vehicles (on Indianapolis at Calumet) to 30,000 vehicles (on Calumet at 121st Street).



**HAMMOND MARINA
ACCESS STUDY**
City of Hammond
Hughes Associates

**TRAFFIC VOLUME COUNTS
1978 AND PROJECTED 2000**

16,240	1978 AVERAGE DAILY TRAFFIC (ADT)
(30,980)	PROJECTED 2000 AVERAGE DAILY TRAFFIC (ADT)



**FIGURE
2**

scale 0 1200 feet

The proposed Marina would add a projected 770 vehicles on weekdays during the boating season. Even this large of an addition is likely to occur only when weather (and driving) conditions are good.

As illustrated in Table 3, Marina peak traffic would occur "off peak" compared to most of the existing Calumet Avenue traffic generators if the Calumet Avenue corridor were used.

The existing Lake Avenue access could not be used for Marina access without severely disrupting existing conditions. Lake Avenue currently has only 28 feet of pavement with parking on both sides of the street. Thus, only one lane is available on a substantial portion of this street. This type facility could not accommodate projected Marina traffic without removal of parking on one side of the street or widening the street.

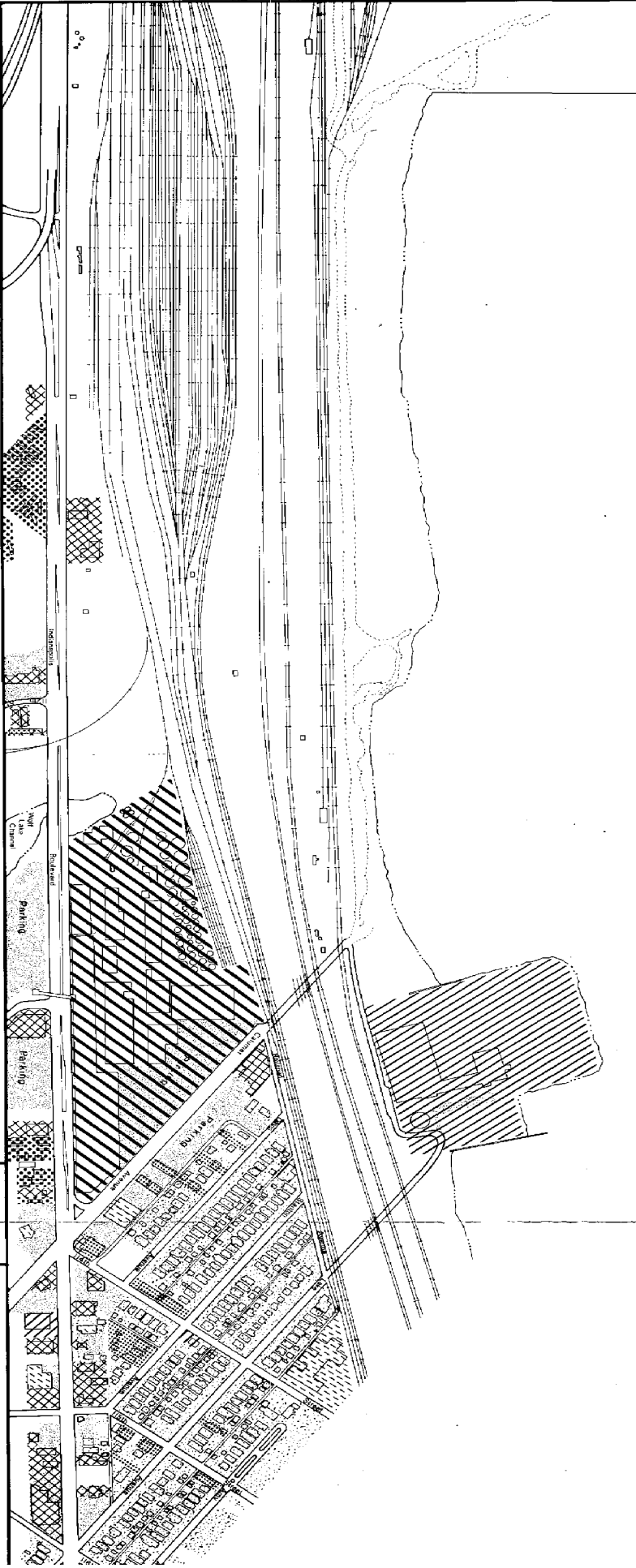
LAND USE

The first section of this report covered current and projected traffic in the study area, traffic generated by the Marina and access corridor facility requirements. The purpose of this study phase was to identify existing conditions and potential future conditions in the study area which might affect Marina access. Existing conditions studied included land use, structural conditions, public rights-of-way, building set-backs and natural and man-made barriers to access. Potential future conditions include development possible under the City's land use controls.

EXISTING LAND USE

a survey of existing land uses in the study area was conducted in February of 1980. The results of this survey are shown in Figure 3. Major uses include open area and Hammond Water Works in the lake shore; rail, rail yard and industrial uses west of Calumet Avenue; residential uses east of Calumet between Railroad Avenue and Indianapolis Boulevard; and commercial uses along Calumet and Indianapolis Boulevard. Each of these use areas are well defined and fairly homogeneous. The most significant exception is the presence of a few apartment buildings in the single family residential area.

Lake Michigan



HAMMOND MARINA ACCESS STUDY

PROJECT NUMBER CTRB-88-04 -- THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COOPERATIVE FUNDING AGREEMENT ENTERED INTO BY THE CITY OF HAMMOND AND THE STATE OF INDIANA THROUGH THE INDIANA DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE DEVELOPMENT.

- EXISTING LAND USE
- Single Family
 - Multi Family
 - Retail Commercial
 - Service Commercial
 - Public/Semi-Public
 - Recreational
 - Manufacturing
 - Mobile Home



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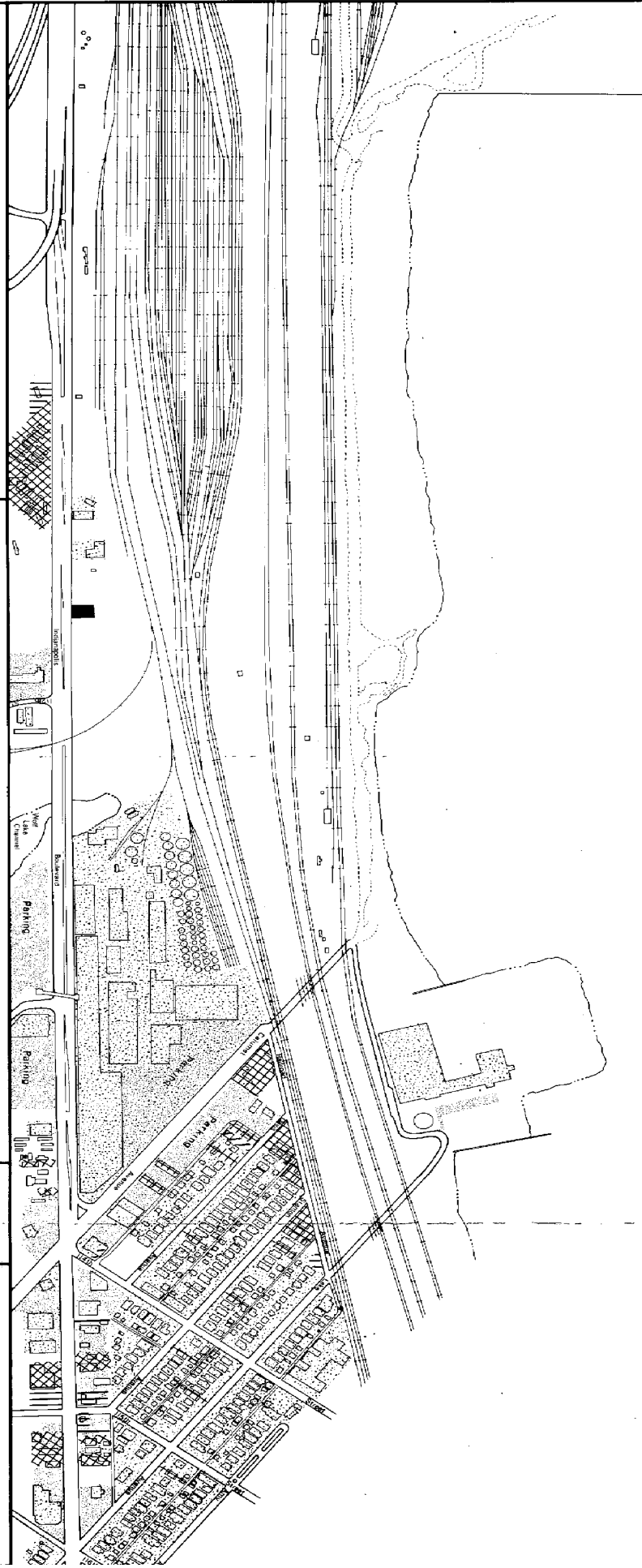
STRUCTURAL CONDITIONS

A structural conditions survey was conducted at the same time as the land use survey. Each structure in the planning area was rated according to the following:

<u>RATING</u>	<u>CONDITIONS</u>
#1 Sound	Sound, well maintained with no apparent deficiencies.
#2 Minor Deficiencies	Sound, but requiring minor repairs such as paint or repairs to gutters and downspouts, porches, trim or replacement of roofing.
#3 Major Deficiencies	Deterioration not correctable by normal maintenance such as replacement of siding, roofing and roof sheathing, wiring or plumbing.
#4 Delapidated	Deteriorated to the point where repair becomes economically infeasible because of failure of structural components such as wall, floor, or roof structure.

Figure 4 illustrates the structural rating of each structure in the study area. Only one structure, located south of 110th Street on Indianapolis Boulevard, was rated #4 - Dilapidated. 21 structures were rated #3 - Major Deficiencies and 82 rated #2 - Minor Deficiencies. Structures with major and minor deficiencies were concentrated along

Lake Michigan



HAMMOND MARINA ACCESS STUDY

PROJECT NUMBER: CDR-80-20 -- THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COOPERATIVE AGREEMENT BETWEEN THE CITY OF HAMMOND AND THE U.S. ARMY CORPS OF ENGINEERS. THE MAP WAS PREPARED BY THE CIVIL ENGINEERING AND SURVEYING DIVISION OF THE U.S. ARMY CORPS OF ENGINEERS, MILWAUKEE DISTRICT OFFICE, MILWAUKEE, WISCONSIN.

STRUCTURAL CONDITIONS

- XXXXXX SOUND DEFICIENCIES
- ||||| MINOR DEFICIENCIES
- MAJOR DEFICIENCIES
- DILAPIDATED



CITY OF HAMMOND
Department of Planning
and Development
Hughes Associates



the Indianapolis Boulevard commercial strip and to a lesser extent in the eastern portion of the residential area and along Railroad Avenue.

PUBLIC RIGHTS-OF-WAY

Street rights-of-way were studied in order to identify potentials for improving existing access corridors or creating new access points. Street rights-of-way for the study area are shown on Figure 5. Both Calumet and Indianapolis were at least 80 feet with Indianapolis widening to 100 feet west of Calumet. Rights-of-way on the balance of the streets, mostly residential, were either 60 or 66 feet. The only existing rights-of-way across the rail lines were those of Calumet and Lake Avenues.

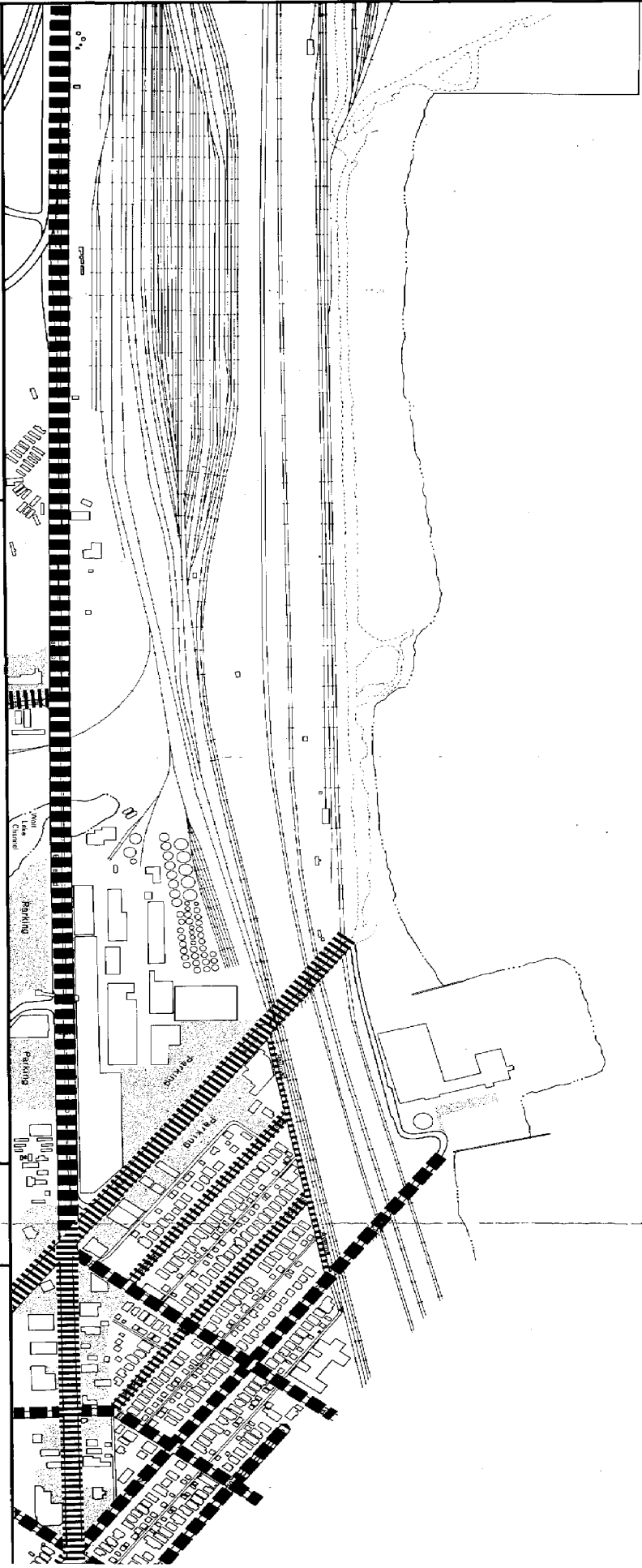
SET-BACKS

Building set-backs, Figure 6, were generally one to five feet along the Calumet and Indianapolis commercial strips. Front yard set-backs for the residential streets range from five (5) to twenty-five (25) feet, but were generally twenty-five (25) feet. Houses generally fronted on north-south streets and side yard set-backs off east-west streets were often less than five (5) feet.

BARRIERS

The principal existing barriers to Marina access are rail

Lake Michigan



HAMMOND MARINA ACCESS STUDY

PROJECT NUMBER: 0308-0001 -- THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COMPREHENSIVE OFFICE OF COASTAL ZONE MANAGEMENT NATIONAL GREAT LAKES DISTRICT AND HISTORIC ADMINISTRATION

40 FEET
60 FEET
66 FEET

RIGHT-OF-WAY

80 FEET
100 FEET

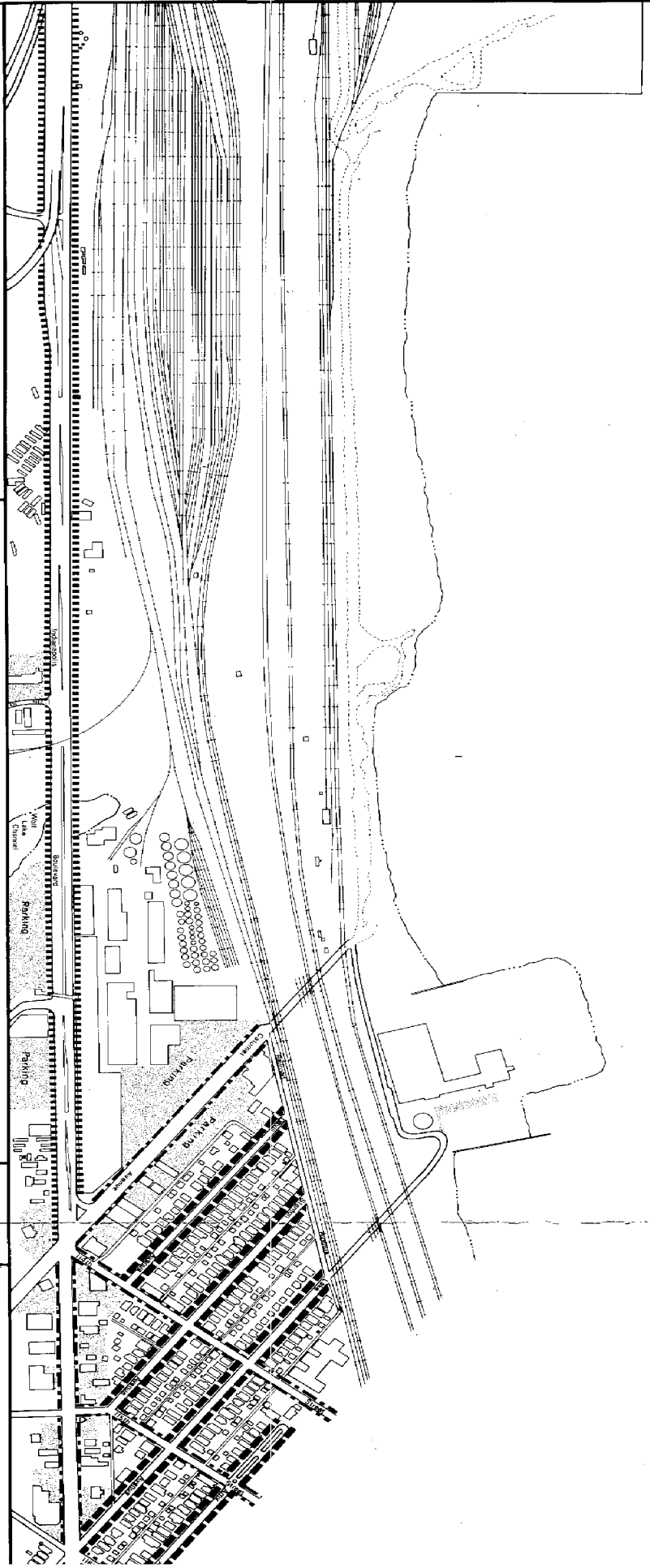


north

SCALE 0 10 20 30 40 50 60 70 80 90 100

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and Development /
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Lake Michigan



HAMMOND MARINA ACCESS STUDY

PROJECT NUMBER: 7389-83-01 -- THE REVISION OF THIS MAP WAS FINANCED, IN PART, THROUGH A COOPERATIVE AGREEMENT BETWEEN THE CITY OF HAMMOND AND THE U.S. DEPARTMENT OF COMMERCE, OFFICE OF COASTAL ZONE MANAGEMENT, AND DONALD, CRONIN AND ASSOCIATES, ARCHITECTS, INC.

SET BACK
1-5 FEET
10-15 FEET
20-25 FEET



CITY OF HAMMOND
Department of Planning
and Development
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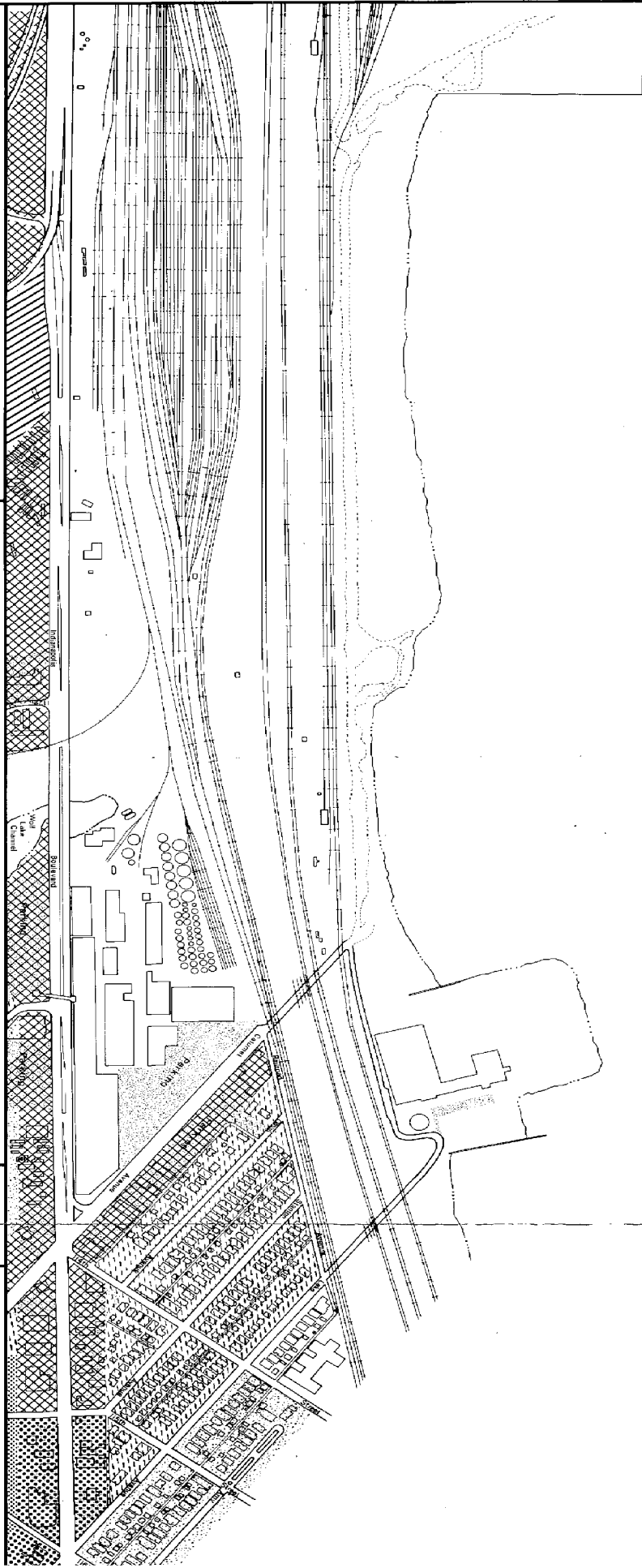
lines and yards, a major industrial complex and a closely developed residential area. The rail tracks parallel the lake front creating a barrier ranging from 600 to 1,200 feet wide. The City currently has two rights-of-way across these tracks at Calumet and Lake Avenues. The Lever Brothers' complex occupies some 30 acres at Calumet and Indianapolis Boulevard and has some 1,500 employees. The residential area east of Calumet between Indianapolis and the rail lines is closely developed on narrow (28 feet) residential streets. The vast majority of homes in this area are sound and well maintained.

ZONING

Under the City's current Zoning Ordinance, the following uses would be permitted in the study area as show in Figure 7.

1. "A" Residence District - "A" residential district generally allows only single family residential uses of up to 7 housing units per net residential acre. "A" residential also allows contingent uses which are not incompatible with residential uses.
2. "B" Residence District - "B" residence district allows single and two family units with single family densities of up to 10 units per net residential acre and two family densities of up to 14 units per net residential acre. Other permitted uses are contingent uses which are compatible with residential use.

Lake Michigan



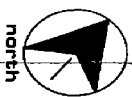
HAMMOND MARINA ACCESS STUDY

PROJECT NUMBER: 2008-03-01 -- THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COMPENSATORY PLANNING GRANT PROVIDED BY THE CAPITAL ZONE MANAGEMENT ACT OF 1982, AS AMENDED, ADMINISTERED BY THE OFFICE OF CAPITAL ZONE MANAGEMENT, NATIONAL, ECONOMIC AND DEVELOPMENT ADMINISTRATION.


EXISTING ZONING MAP

[Cross-hatch pattern]	"A"	RESIDENCE DISTRICT	[X-hatch pattern]	"GB"	GENERAL COMMERCIAL DISTRICT
[Diagonal hatch pattern]	"B"	RESIDENCE DISTRICT	[Vertical line pattern]	"LI"	LIMITED INDUSTRIAL DISTRICT
[Horizontal line pattern]	"C"	RESIDENCE DISTRICT	[Vertical line pattern]	"HI"	HEAVY INDUSTRIAL DISTRICT
[Checkered pattern]	"D"	LOCAL BUSINESS DISTRICT			

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SCALE: 1" = 50'



3. "C" Residence District - The "C" residence district allows single family, two family, group housing, and apartments with maximum of up to 36 units per acre for apartment developments. In "C" residence district, single family uses can range up to 14 units per net residential acre.

4. "LB" Local Business District - Local business includes automotive services, business and personal services, food services including restaurants and groceries, retail sales such as drug stores, apparel and showrooms, and commercial recreation such as theaters, taverns, and bowling alleys. "LB" districts require no set-back and buildings may be as high as 60 feet or 5 stories.

5. "GB" General Business District - General business permits all permitted uses in "LB" district and department stores, wholesaling and warehouses and passenger transportation stations.

6. "LI" Limited Industrial District - Limited industrial uses include building and open area for manufacturing, processing, repairing, storage, and disposal, enclosed junk or wrecking yards, bulk storage, truck terminals, freight yards. This district requires no set back and up to 90 percent of the lot may be occupied. Buildings may be 60 feet in height or 5 stories.

7. "HI" Heavy Industrial District - Heavy industrial uses includes limited industrial use in addition to railroad yards and shop and commercial harbors. "HI" requires no

set-back and uses may occupy 90 percent of the lot.

Buildings 60 feet in height are permitted, taller buildings require set-backs.

Expansion of uses in the study area would be limited by parking requirements established by the Ordinance. In general, the existing Zoning Ordinance requires one space for each residential unit, parking area of two times floor area for business and commercial uses and one space for every three employees for industrial uses.

POTENTIAL LAND USE CHANGES

In order to identify potential future impacts on or from Marina access, possible changes in use in five use areas in the study area were assessed. These areas include: the rail lines; the industrial complex at the northwest quadrant of Calumet and Indianapolis (Lever Brothers); the commercial uses along Calumet; the residential area west of Calumet; and the lake shore area itself.

The area of the lake shore rail lines is not expected to change significantly in the future. The Rail Relocation and Consolidation Study has made no recommendations regarding relocation of traffic to or from this area. It may, however, be possible to consolidate tracks within the corridor. Such consolidation would reduce the roughness of at grade crossings, but would not be expected to decrease the number of train/car conflicts.

Lever Brothers is currently involved in a major five year construction project which is scheduled for completion in 1983. This construction has resulted in the relocation of employee parking from the site to the employee lot across Indianapolis Boulevard. Other future construction on the site (if any) would not increase traffic on Calumet. Management's efforts to encourage employee use of the Indianapolis Boulevard parking lot will result in reduced congestion on Calumet and reduce the need for on street parking on Calumet.

The City's off Street parking requirements could be used to effectively limit any further traffic generation from the commercial uses on the west side of Calumet. Any expansion of these uses would require additional off street parking space -- space which is not readily available. In the past, some additional commercial parking was developed through the removal of residential uses. Most of the homes in this area are, however, in good condition and further parking expansion in this manner is not expected to be substantial. The possible future land use change with the greatest potential for impact on the proposed Marina, Marina access and the area in general could occur in the Lake itself. The Northern Indiana Public Service Company (NIPSCO) has revived an old proposal calling for development of a

coal fired generating plant. The plant would be built on fill extending into the Lake from property currently owned by NIPSCO on the lake front between the Commonwealth Edison plant and the Hammond Water Works.

Implementation of this idea would affect Marina siting and would significantly increase traffic to the lake shore. Such a facility might be expected to generate construction employment of 600 to 800 and operating employment of 200 to 300.

While the development of a generating plant would not preclude Marina development in the area (perhaps east of the Water Works plant), it would significantly change requirements for a lake front access corridor.

ANALYSIS AND RECOMMENDATIONS

The first section of this report covered current and projected traffic in the study area, traffic generated by the Marina and access corridor facility requirements.

The second section identified existing and potential future conditions in the study area (land use, structural conditions, barriers, etc.) which might affect or be affected by the Marina access. The purpose of this study section is to identify and evaluate alternative access corridors, to make recommendations regarding actions related to the recommended access alternative.

DESIGN CRITERIA

The work program for this study established safety, convenience and minimum disruption of existing traffic and land use as major areas of concern in establishing criteria by which an access corridor or facility would be evaluated. A fourth criteria, facility/corridor cost, will of course be among the most important criteria on which a final decision is made.

Safety

Concerns for safety would include potential areas or points of conflict between Marina user vehicles and other vehicles, pedestrians, and trains. Concern with conflicts among vehicles is reflected in criteria for facility capacity, design level of service (L.O.S.) "C" was assumed

to be the appropriate criteria for a fully acceptable facility design. For potential vehicular conflicts at the intersection of the access facility with the arterial highway system, it was assumed that signalized controls would be required to provide adequate safety. Since conflicts between through traffic and parking movements are a major source of accidents, the effect of existing parking practices (particularly on-street) was a significant element in evaluation of alternatives.

Pedestrian safety is a concern especially where children are present. The criteria of pedestrian safety would be a concern primarily where access facilities pass through residential areas or near schools.

The potential for vehicle/train conflicts is obviously a major factor in evaluating any access alternative. The proposed Marina is separated from arterial system access by a minimum of 9 sets of tracks including four high speed, mainline tracks. Any Marina access facility should include either grade separation or protection by gates and flashers. In addition, crossings would have to be smooth enough to avoid damage to trailered boats. Separated crossings would require reasonable approach slopes -- a maximum of 6 percent slope for approaches was used.

Convenience

The design criteria for convenience of access corridors/

facilities in some cases overlapped criteria for safety. For example, lane requirements, approach slopes, intersection capacities and other traffic elements were designed to provide convenience as well as safety. Additional convenience criteria related to providing as simple and direct access, as possible, from the arterial system to the Marina. This would include providing a place for vehicles to wait while an at grade crossing is closed by train traffic. As discussed in the first section of this report, as much as 600 feet of vehicle storage capacity (one lane) would be required to hold train delayed, peak hour traffic.

Environmental Impact

The major criteria for assessing environmental impact was disruption of existing beneficial land uses and community values. Examples of adverse impacts would include disruption of sound residential areas or industrial or commercial enterprises.

Cost

Obviously, the cost of development of alternative access facilities will play a major factor on the selection of an alternative. Cost estimates (in 1980 dollars) were developed for each potential alternative. In addition, environmental impacts, such as the examples given above, would have economic and social costs. While these costs were considered, they were not specifically quantified.

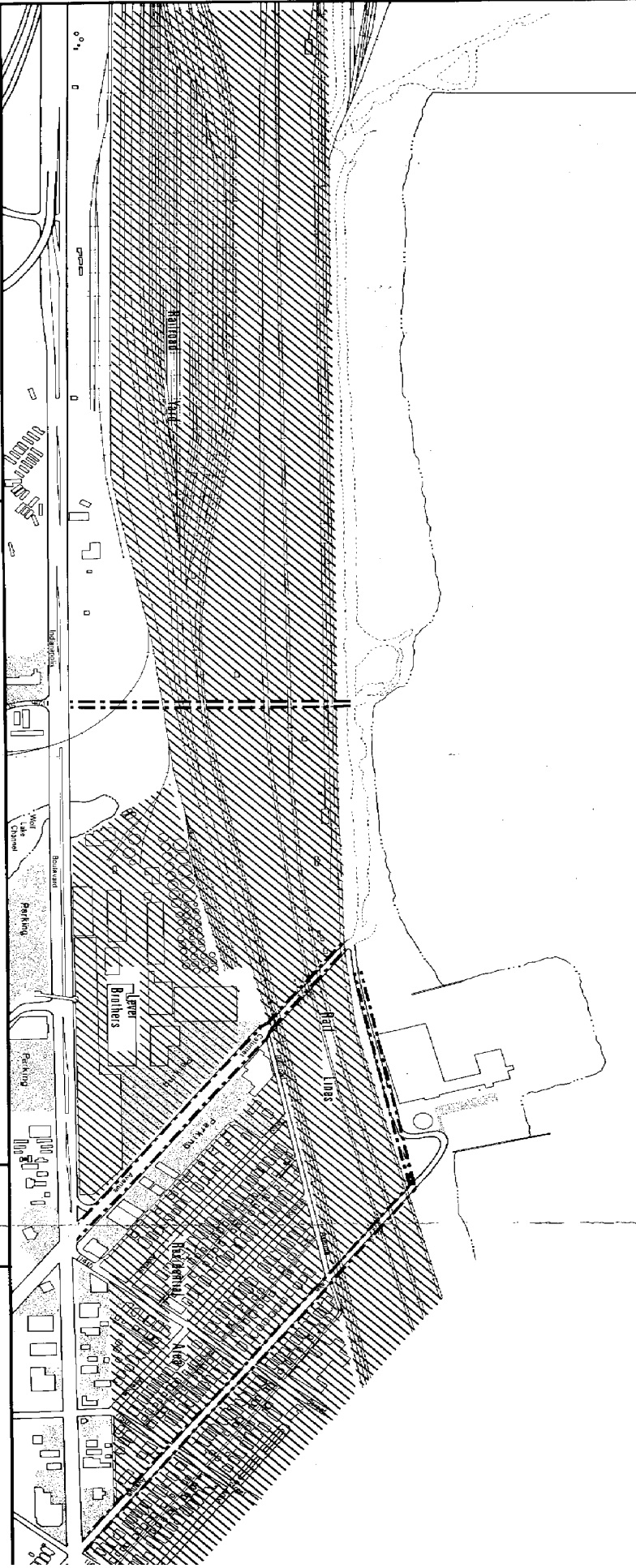
ALTERNATIVES

Potentials for Marina access include alternative access corridors and alternative types of facilities within each corridor. The first step in identifying access potentials was to identify potential corridors in light of existing barriers.

The existing barriers were identified in the preceding section of this report and are shown in Figure 8. These barriers include the rail lines and yards, the Lever Brothers industrial complex and the residential area between Indianapolis Boulevard and the rail lines. Based on an analysis of these barriers and the established design criteria, three potential access corridors were identified. These corridors are also shown on Figure 8 and include an extension of 112th Street ("A"), Calumet Avenue ("B"), and Lake Avenue ("C"). Corridor "A" would require a new set of rail crossings and new right-of-way, but would not affect other barriers. The "B" and "C" corridors would use existing public rights-of-way. Corridor "B" would use Calumet Avenue which has an 80 foot right-of-way. Corridor "C" would follow the Lake Avenue right-of-way through the residential area "barrier".

For each of the potential access corridors, several types of facility designs were considered. These include the following:

Lake Michigan



HAMMOND MARINA ACCESS STUDY

PROJECT NUMBER: C208-80-01 -- THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COMPREHENSIVE REVENUE GRANT PROVIDED BY THE CENTRAL GOVERNMENT ACT OF 1972. CONSULTANT: HUGHES ASSOCIATES, INC., 1000 WEST 10TH STREET, SPOKANE, IDAHO 83402.

POTENTIAL ACCESS
POTENTIAL ACCESS BARRIERS
POTENTIAL ACCESS CORRIDORS



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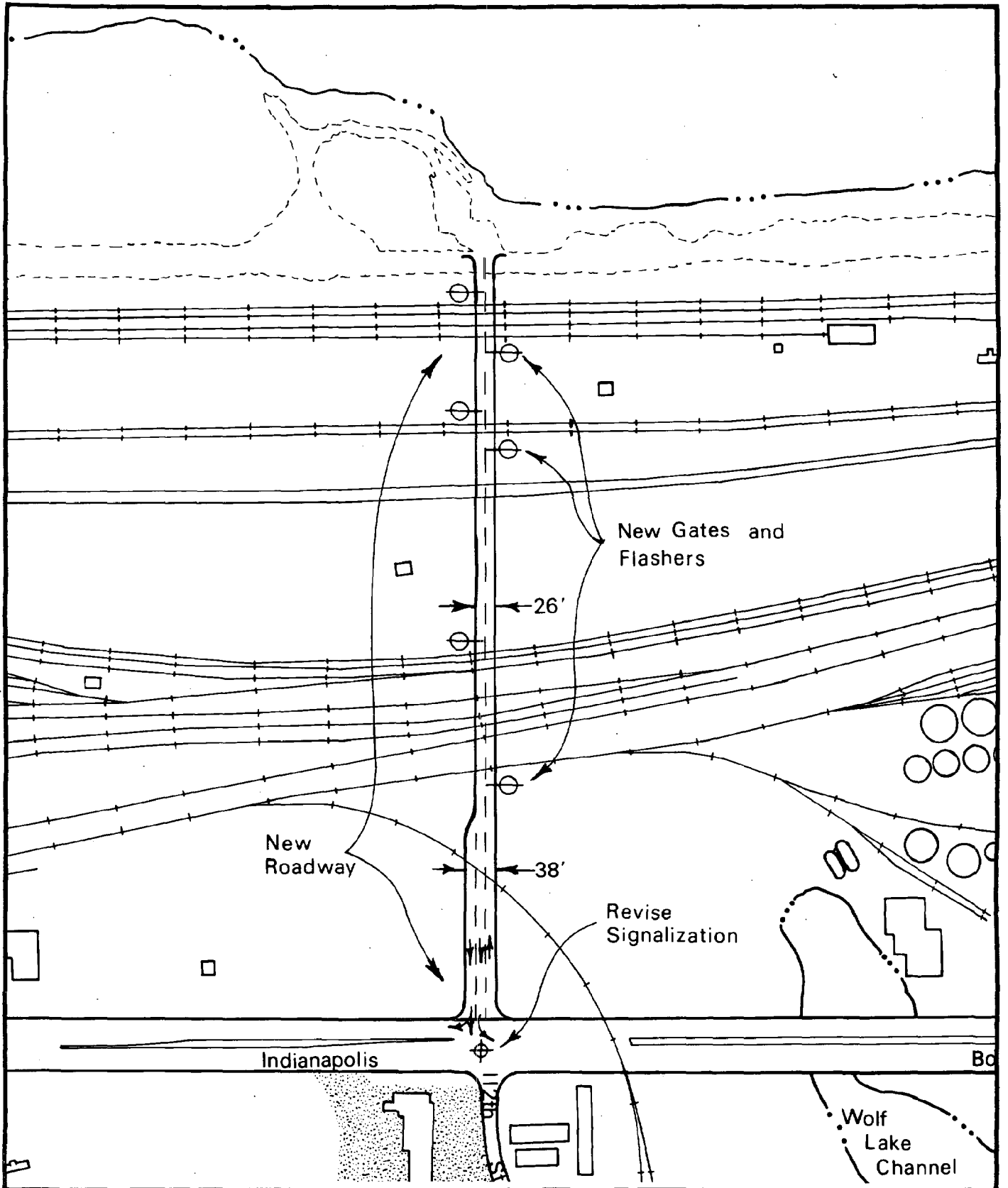
- A. 112th Street Corridor
 - 1. At Grade
- B. Calumet Avenue Corridor
 - 1. At Grade
 - 2. Overpass
 - 3. Underpass
- C. Lake Avenue Corridor
 - 1. At Grade

A. 112th Street Corridor

1. At-Grade Crossing - There is not sufficient space available in this corridor to allow for the approaches required for grade separations. This proposed at-grade facility would extend from the existing signalized intersection of 112th Street and Indianapolis Boulevard northeast to the Marina site. The facility would include 300 feet of 38 foot and 100 feet of 26 foot pavement from Indianapolis to the rail lines and a 750 foot, 2 lane crossing. In addition, 3 sets of gates and flashers would be required as well as pavement markings and new signals at the Indianapolis Boulevard crossing. The estimated cost of this facility would be \$505,000. (See Figure 9)

B. Calumet Avenue Corridor

The existing public right-of-way for Calumet is 80 feet wide extending to the lake shore. Sufficient width and approach length is available to accommodate either an overpass or underpass.



**HAMMOND MARINA
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ALTERNATE A-1
112TH STREET CORRIDOR
AT-GRADE CROSSING



north

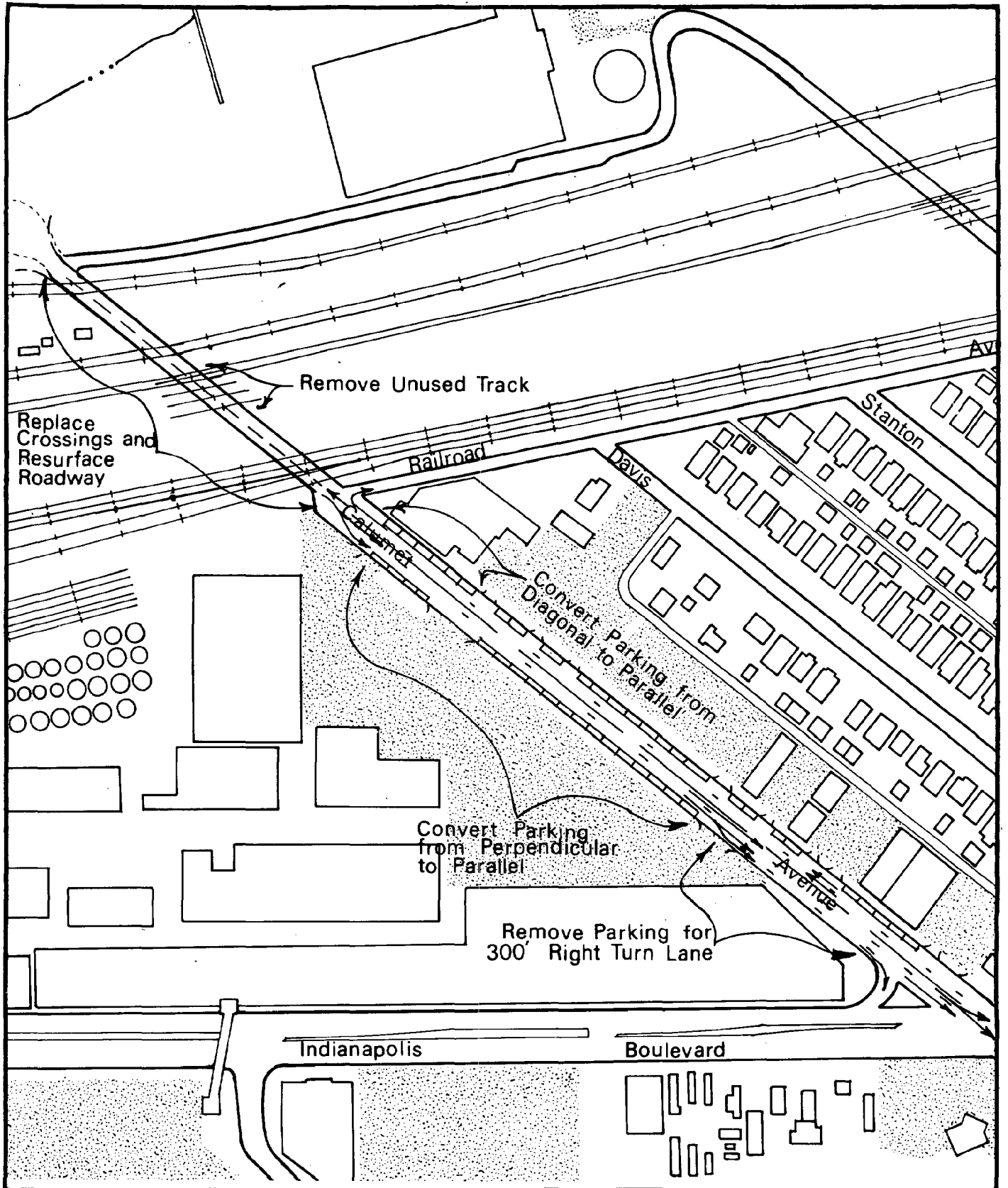
FIGURE

9

scale 0 200 feet

1. At Grade Crossing - A Calumet at-grade access would utilize existing pavement and crossing protection. Four existing sets of unused track should be removed. The entire length of the crossing area (530 feet) needs to be resurfaced and the nine crossings replaced to improve the speed and convenience of crossing. The estimated cost of this improvement would be approximately \$178,000 including new center, edge and crossing markings. In addition, parking along Calumet should be converted from perpendicular to parallel and removed for a south bound right turn lane at Indianapolis Boulevard. (See Figure 10)

2. Overpass Bridge - A Calumet overpass would provide two traffic lanes and a five foot sidewalk in a width of 36.5 feet. The bridge would have to include spans over access roads both north and south of the rail lines as well as over the tracks themselves (see Figure 11). The overall length of the structure would be 615 feet with 90 feet over access streets and 525 feet over track. The 23 foot rail clearance would require 900 foot approach ramps on each end to provide a maximum 6 percent slope. The approach ramps would be built with concrete retaining walls so that ground level access roads could be maintained on both sides. A sketch of the overpass layout and cross sections is shown in Figure 11. The estimated cost of the grade separation is \$4,200,000.



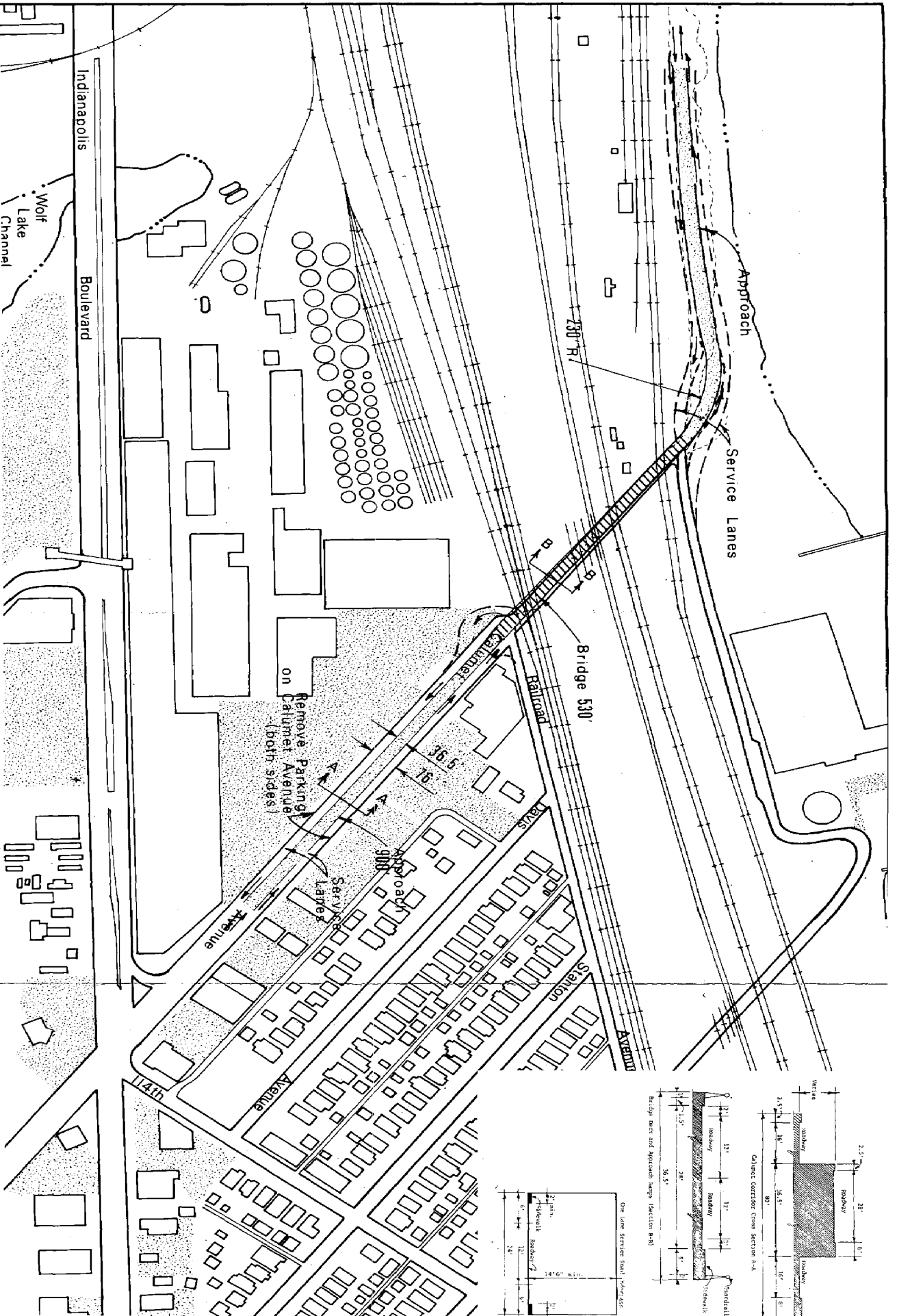
**HAMMOND MARINA
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ALTERNATE B-1
CALUMET AVENUE CORRIDOR
AT-GRADE CROSSING



**FIGURE
10**

scale 0 200 feet



HAMMOND MARINA ACCESS STUDY

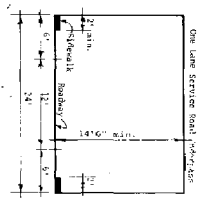
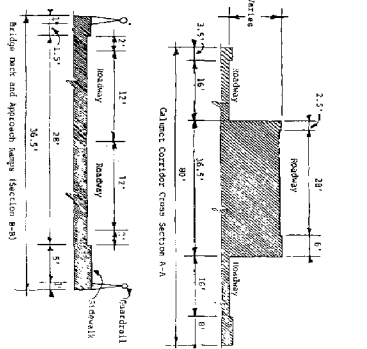
ALTERNATE B-2
CALUMET AVENUE CORRIDOR
OVERPASS

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FIGURE 11

Scale: 0 200 400 feet

North



3. Underpass - The layout of a Calumet Avenue/R.R. underpass would be similar to that of the overpass. The tunnel depth would be less than the rail clearance height for the overpass so that the approach ramps would be only 600 feet. The 14-15 foot tunnel height would, however, place the tunnel below lake level requiring permanent pumping of ground water. Each of the nine rail tracks would have to be relocated temporarily during construction. If feasible at all, construction of an underpass would be very expensive -- roughly \$20,000,000.

C. Lake Avenue Corridor

The Lake Avenue right-of-way is 66 feet wide and extends to the Hammond Water Works Plant. Neither underpass nor overpass facilities were considered because of a lack of right-of-way width on the south and length on the north to accommodate the approach ramps. Either underpass or overpass structures would also have a degrading effect on adjacent residential land uses.

1. At-Grade Crossing - The existing crossing and needed crossing improvements at the Lake Avenue crossing area is similar to those on Calumet Avenue. Approximately 540 feet of resurfacing and nine crossing improvements would be needed, as well as the removal of four unused sets of rails. In addition, improvements would be required at both the north and south approaches to the crossing. At the north

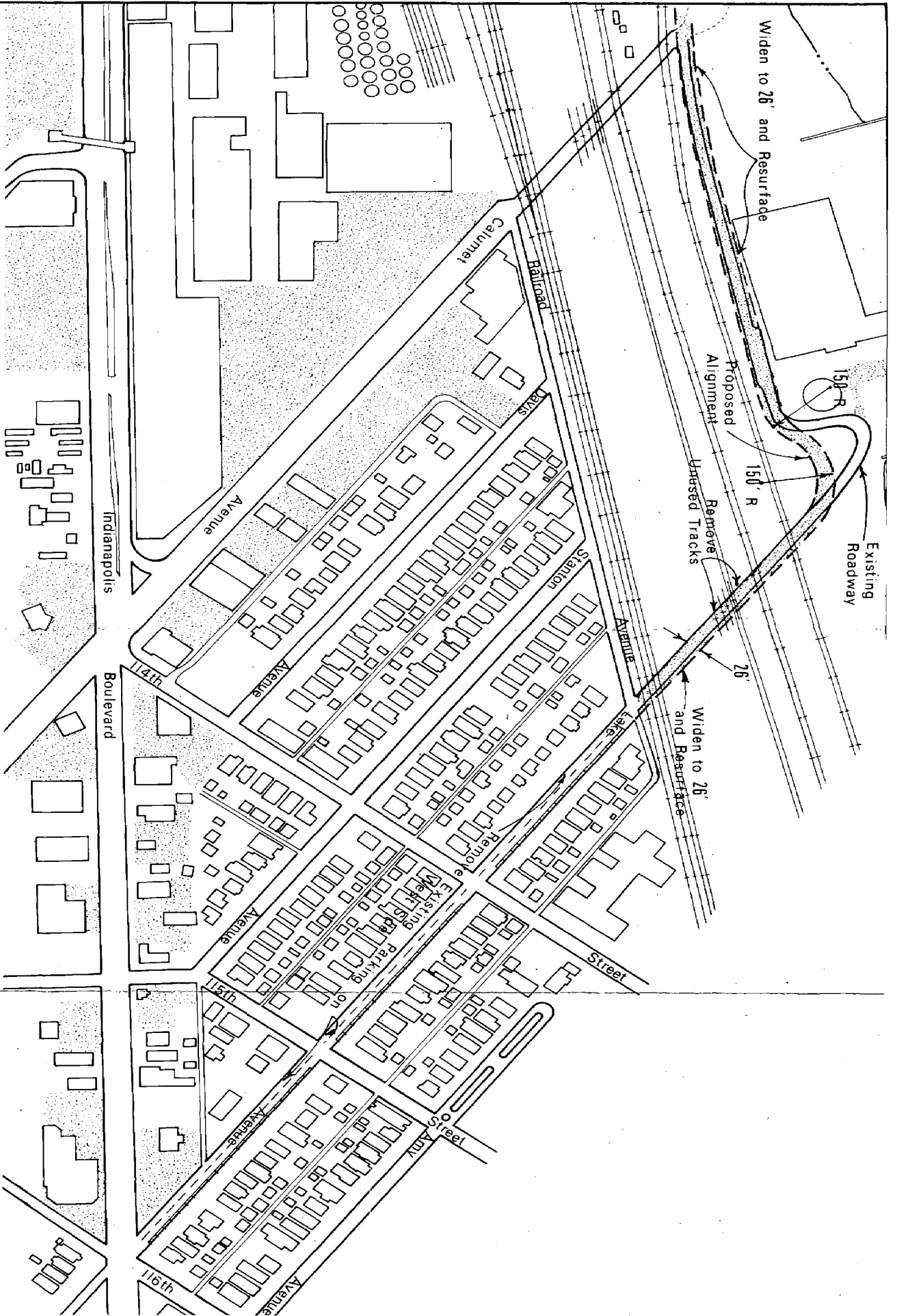
end the "U" and 90° turns should be replaced with reverse curves of 150 foot radius. (see Figure 12). The access road in front of the Water Works Plant would need to be widened from 15 to 26 feet. South of the rail crossing, parking would have to be eliminated on one side to provide full two lane capacity. As an alternative, Lake Avenue could be widened by four feet for a distance of 1,500 feet from Railroad to Indianapolis Boulevard. Widening would probably be carried out on the east side to minimize loss of trees. The estimated cost of these improvements, based on the first alternative -- removal of parking on one side -- would be approximately \$231,000.

EVALUATION OF ALTERNATIVES

Of course, the easiest means of comparing alternatives is on the basis of cost. Table 6 shows a summary and comparison of costs of each of the alternatives described above. Each of the alternatives would provide sufficient capacity to accommodate the projected Marina traffic volumes. Following are assessments of how well each alternative meets the other criteria of safety, convenience, and impact.

112th Street At-Grade Crossing

This alternative would require new rail crossings with combined crossing length nearly 200 feet longer than those existing at Calumet and Lake. The right-of-way and



**HAMMOND MARINA
ACCESS STUDY**

ALTERNATE C-1
LAKE AVENUE CORRIDOR
AT-GRADE CROSSING

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FIGURE 12

Scale: 0 200 400 feet

North

COMPARATIVE COSTS BY ALTERNATIVE

Table 6

HAMMOND MARINA ACCESS CORRIDORS/FACILITIES

ALTERNATIVE	LOCATION/DESCRIPTION	IMPROVEMENT COST	COMPARATIVE RATIO
A - 1	112th Street	\$ 505,000	2.8
B - 1	Calumet Avenue -- At-Grade	178,000	1
B - 2	Calumet Avenue -- Bridge	4,200,000	23.6
B - 3	Calumet Avenue -- Tunnel	20,000,000	112.4
C - 1	Lake Avenue -- At-Grade	231,000	1.3

Source: Hughes Associates

street would be new and access along the corridor could be controlled. The open area around the south end of this corridor would also lend itself to the development of a more "park like" entrance than the other alternatives. The major potential obstacle to this proposal would probably be obtaining additional rights-of-way for at-grade crossings. This right-of-way would be very near the existing Colehour Rail Yards and, at the time of field surveys, train cars were parked in the path of the proposed crossing. The cost of this alternative was approximately 2.8 times the cost of the least expensive alternative.

Calumet Avenue At-Grade

This facility currently exists, but needs improvements as described previously. It is one of the most direct of the alternatives and has good, signal controlled access to the arterial highway system (U.S. Routes 41 and 12/20). The right-of-way and existing paved roadway of Calumet is adequate to accommodate projected Marina traffic without significantly affecting access to the existing uses. The existing uses along Calumet (primarily industrial and commercial) are not likely to be adversely impacted by the Marina traffic. Peak use of the Marina will occur when other Calumet Avenue traffic generators are closed or at their lowest level of activity. Marina users will experience some delays due to the rail activity averaging three trains

per hour during the peak hours of use. Existing perpendicular parking on Calumet poses potentials for conflict and traffic accidents. The estimated cost of needed improvements for this alternative is the lowest of all the alternatives.

Calumet Avenue Overpass

A Calumet Avenue access using a railroad overpass would have most of the same benefits as the Calumet At-Grade. In addition, all rail conflict and inconveniences would be eliminated. The need for approach ramps would, however, require a change in parking arrangements from perpendicular to parallel and would in effect create a pair of one lane, one way streets for a least 900 feet along Calumet. Any traffic entering this one way pair from the south would have to continue north to the service road underpass before returning south. This would result in inconvenience to patrons of businesses adjacent to the ramp and might create problems in getting trucks into the Lever Brothers plant. The ramps would have adverse visual impacts. For example, there would be a concrete wall 20+ feet high approximately 20 feet from the front of Phil Schmidt's Restaurant. At an estimated \$4,200,000.00, this alternative is one of the most costly.

Calumet Avenue Underpass

A Calumet Avenue railroad underpass would have approx-

imately the same problems and benefits as an overpass, without the adverse visual impacts. However, with the problems of temporary rail relocation, ground water, and the \$20,000,000.00 estimated cost, this alternative would clearly be impractical.

Lake Avenue At-Grade

A Lake Avenue access would be less direct and more costly than any similar access on Calumet. In addition, the use of Lake Avenue would present an unacceptable adverse impact on the adjacent, sound residential area. Safety hazards would also be greater with a Lake Avenue access because of the pedestrian traffic generated by the residential uses and the Franklin Elementary School which is located at Lake Avenue and Indianapolis Boulevard.

CORRIDOR/FACILITY RECOMMENDATIONS

Based on the preceding analysis, the Calumet Avenue Corridor with an at-grade rail crossing seems to be the best alternative for access to the proposed Hammond Marina. With the improvements described earlier, this facility would provide:

1. Adequate capacity and safety;
2. The most direct and best access to the arterial highway system;
3. The lowest cost; and
4. The least impact on surrounding traffic and land uses.

While this facility would meet design criteria with the improvements previously described, additional alternative improvements would improve efficiency and provide a more attractive corridor. Plan and profile sketches of suggested improvements are shown in figure 13. The suggested corridor improvements illustrated in figure 13 would provide four traffic lanes between Indianapolis Boulevard and Railroad Avenue and two lanes from Railroad Avenue across the railroad tracks to the lake shore. The outside, north bound traffic lane would terminate as a right turn lane onto Railroad Avenue at a proposed pedestrian island/traffic diverter.

On street parking would be provided in an eight foot parking lane on the east side of Calumet. In addition, the outside traffic lane on the west side of Calumet would be used for parking except for periods when south bound Marina traffic is at its peak.

The suggested plan also includes a ten foot center lane which is used for islands, mountable medians, and turn lanes. The median islands would be large enough to accommodate park signs, landscaping and trees. Trees and shrubs would have to be carefully located and maintained to provide maximum aesthetic benefit and to avoid creating any traffic hazards. Additional trees could be planted

in the area of the railroad tracks, as long as adequate site distances are maintained.

The plan includes a sidewalk from Railroad Avenue to the lake shore to increase convenience for pedestrians. The addition of rubberized railroad crossings should also be considered to increase the ease of Marina access for vehicles, particularly those trailering boats.

While the cost of these additional improvements would depend on more detailed design work than presented here, the total cost should be approximately \$180,000. The largest single cost element would be the installation of rubberized crossings at an estimated cost of \$140,000. Other estimated costs were: sidewalks - \$6,000; traffic islands - \$15,000; curbing - \$10,000; medians, pavement markings, signs - \$5,000; and landscaping - \$5,000.

RELATED ACTIONS

Recommendations regarding Marina access were based on an assessment of existing conditions and an evaluation of expected future conditions. Major future changes, other than those expected, could have an adverse impact on the Marina access facility. While the proposed facility will be more than adequate for projected daily and peak traffic, substantial increases in traffic generation along the corridor or in the lake shore area could result in some additional congestion. Even a major lake shore development could be handled with the expansion of the rail crossing segment to four lanes.

Major increases in traffic generation along Calumet would be limited by a lack of space for further development and off-street parking requirements. Current zoning regulations require, in general, one space for each residential unit, parking area of two times floor area for business and commercial uses and one space for every three employees for industrial uses. As mentioned previously, on-street parking on Calumet should, by ordinance, be changed from perpendicular to parallel. This should probably be done after Lever Brothers completes its current building project. In fact, when this project is completed (1983), and when Lever Brothers' Indianapolis Boulevard parking lot is in full use (see page nine of this report), it

seems there will be little need for any on-street parking on the west side of Calumet. This area then could be considered for either additional lane capacity, landscaping, or both.

As mentioned earlier, the development of a coal fired generating plant has been proposed for the lake front, immediately east of the existing Commonwealth Edison generating plant. If built, additional average daily traffic counts along the access corridor could be expected to increase by as much as 800-900 or more vehicles, depending on plant size and operating characteristics. Such an increase in traffic might justify the construction of a grade separation. In addition, power plant development would result in a different location for the Marina itself -- perhaps to the area immediately east of the Hammond Waterworks plant. While this location would still be best served by a Calumet Avenue corridor, Marina users, particularly those coming from the east, would be tempted to use Lake Avenue for access/egress. As pointed out earlier, any increase in traffic on Lake Avenue would generate local congestion and safety hazards and would tend to degrade adjacent residential land uses. Thus, ways to discourage use of Lake Avenue by Marina users would need to be found. The current condition of the Lake Avenue rail crossing would discourage many potential users.

Use of this access could further be discouraged by making Lake Avenue crossing area one-way north or by closing the crossing completely.



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