

KODIAK

PLAN +

DEVELOPMENT

STRATEGY

SUMMARY
REPORT

kodiak island borough

regional plan and development strategy

summary report

july 1978

The preliminary findings presented here are part of a technical study being performed by professional consultants under contract with the Kodiak Island Borough and the Division of Community Planning, Department of Community and Regional Affairs of the State of Alaska. The study has been financed in part through an Economic Development Administration Technical Assistance Grant. Statements, findings, conclusions, recommendations, and other data in this report are solely those of the contractor and do not necessarily reflect the view of the Kodiak Island Borough, State of Alaska, or the Economic Development Administration.

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PREFACE

The purpose in preparing the Regional Plan and Development Strategy was two-fold:

- . To assist officials of the Kodiak Island Borough to plan for the full range of government, economic, and social impacts expected to occur during the oil exploration and development programs off Kodiak Island.
- . To develop or bring up to date all necessary elements of a Borough Comprehensive Plan and to schedule needed capital and governmental services improvements to coincide with anticipated offshore events.

This Summary Report reflects the required dual purpose. To this end, this report: 1) embodies the U.S. Economic Development Administration's requirements for planning and economic adjustment strategy and 2) provides the conceptual basis for a comprehensive plan for the Kodiak Island Borough.

A conclusion of the economic adjustment strategy which should be stated at the outset is that since OCS-related development is several years distant, there will be no occasion for the Kodiak Island local governments to seek Title IX implementation grant funding from the U.S. Economic Development Administration in the immediate future. Key issues and recommendations concerning the economic adjustment strategy are outlined under Section I., Introduction and Summary, of this report.

As a component of the comprehensive plan, this Summary Report along with other planning tools including draft zoning and subdivision regulations and a proposed capital improvements program have been submitted to the Kodiak Island Borough Planning and Zoning Commission and Borough Assembly for review.

Following action by the Borough Assembly, the revised and adopted version of the Regional Plan will be a part of the official comprehensive plan for the Kodiak Island Borough. When adopted, the comprehensive plan may differ from some of the provisions of this report. The preliminary character of this report should therefore be recognized, and it should not be interpreted as official Kodiak Island Borough policy.

The Regional Plan has been developed as a series of working papers on distinct study elements. The study elements dealt with such areas as transportation, the borough economy and population, and community services, all of which were intended to assist local government officials in minimizing any impact that might occur. The Summary Report incorporates the substance of these elements in their final recommended form, except for the text of three ordinances which are necessary to implement the comprehensive plan and which were printed separately in final draft form. As noted above, each of these measures will be reviewed, revised and adopted as individual ordinances by the Borough Assembly.

It is therefore expected that after final adoption the Borough will print and distribute the following ordinances:

1. Zoning Ordinance.
2. Subdivision Regulations.
3. Capital Improvements Programming Manual.

A fourth supporting study for the Regional Plan was printed separately in final draft form. This is the Environmental Impact Analysis (EIA) required under the regulations of the U.S. Economic Development Administration. The EIA will not require adoption by the Borough Assembly.

It will be apparent in reading the Summary Report that the focus of the Regional Plan has been on the Kodiak urban area. The reason is that plans for the Kodiak villages have been developed separately for the individual villages, with the aid of the Borough staff. As adopted by the Borough Assembly, the village plans will also constitute an important portion of the final comprehensive plan.

ABSTRACT

This report summarizes the findings and recommendations of the Kodiak Island Borough Regional Plan and Development Strategy.

In broad outline, the major findings and recommendations that have emerged from the study are:

- . The economy of the Kodiak urban area, based upon the fishing industry and the Coast Guard Support Center, is strong and growing. Coast Guard employment is stable for the foreseeable future. The Alaskan fishing industry appears to be on the verge of significant expansion, and Kodiak could attract many of the jobs involved if it can provide the space and services necessary to the industry.
- . . At present, however, certain Kodiak utilities and community facilities are seriously strained. Housing for workers is expensive and in short supply. Until these constraints are removed, industrial growth will be slowed.
- . These shortages in services and housing also have adverse social and environmental effects. Among them are surface water pollution, dust, periodic water and power shortages, high prices, overcrowded housing, and development in hazardous areas.
- . Significant effort and expense will be required to correct these environmental effects and their causes. To minimize this effort and expense as well as to slow the rate of housing cost inflation, concentration of services in the existing Kodiak urban area is recommended.
- . Consideration of natural hazards should also be incorporated into land-use decisions. A principal example is the potential instability of Pillar Mountain. A detailed geotechnical study of the mountain must be carried out before any expansion of the existing City dock and cargo facilities can be undertaken. The degree of tsunami hazard should also be investigated and integrated into future land-use planning decisions.
- . On-shore employment associated with Outer Continental Shelf (OCS) oil exploration and development could seriously aggravate existing socio-economic problems in the urban area. A sudden population boom would require expansion in services that the boom would be too short-lived to finance. The boom would also drive prices and wages up, which could well force the fish-processing industry to move out of Kodiak. The result could easily be a post-boom depression.

If oil is found, the Kodiak Island Borough will probably have to allow an oil terminal to be built somewhere in the Kodiak Archipelago. Siting of the facility can be crucial in determining impacts. From a socio-economic viewpoint, oil terminal development should be sited well away from both the urban area and the villages. Planning permission for a specific proposal should follow only after a complete environmental review. It should also be conditioned on the developers' assumption of responsibility for all utilities, services and community facilities for temporary and permanent work forces.

Depending on the outcome of the geotechnical study of Pillar Mountain, it may be in the Kodiak community's interest to encourage development of a marine service base in conjunction with new community docking facilities. To be prepared to evaluate or even to initiate this type of proposal, the community will need to pursue a detailed examination of the economic and operational feasibility of alternative dock facility locations.

KODIAK ISLAND BOROUGH
REGIONAL PLAN AND DEVELOPMENT STRATEGY

TABLE OF CONTENTS

	<u>Page</u>
Preface	i
Abstract.	iii
Table of Contents	v
List of Figures	vi
List of Tables	vii
I. INTRODUCTION AND SUMMARY	1
Kodiak Planning Program	1
Summary.	3
II. ECONOMIC AND POPULATION	6
Historical Perspective	11
Future Sources of Economic Growth	14
Future Population Forecasts	16
Recommendations	19
III. COMMUNITY GOALS AND OBJECTIVES	20
IV. CAPACITY CONSTRAINTS ON DEVELOPMENT.	27
Natural Constraints	27
Manmade Systems	31
Financial Resources	34
Priority Development Areas	35
Recommendations	36
V. COMMUNITY FACILITIES	46
Infrastructure	46
Projected Community Facility Requirements	48
Recommendations	52
VI. TRANSPORTATION	54
Urban Area Transportation	54
Island-wide and External Transportation	61
Recommendations	63
VII. LAND USE (WITHOUT OCS DEVELOPMENT)	69
Recommended Land Use Plan	69
Major Non-OCS Alternatives	71
Recommendations	73
VIII. OCS-RELATED INDUSTRY	75
Recommendations	77
IX. SHORT-TERM PLANNING TOOLS	81
X. ENVIRONMENTAL IMPACT ANALYSIS	82

LIST OF FIGURES

<u>FIGURE</u>		<u>Page</u>
1.	Regional Location	7
2.	Kodiak Island Communities	8
3.	Kodiak Island Road Network	9
4.	Urban Area and Support Center	10
5.	Existing Land Use	17
6.	Steep Slopes	38
7.	Water and Wetlands	39
8.	Natural Hazards	40
9.	Developable Lands	41
10.	Water System	42
11.	Wastewater System	43
12.	Priority Development Areas	44
13.	Residential Population	45
14.	Existing Road Conditions	65
15.	1977 & 1985 Traffic	66
16.	1995 Traffic	67
17.	Street and Highway Plan	68
18.	Sketch Plan	78
19.	Recommended Land Use Plan	79
20.	Action Projects	80

LIST OF TABLES

<u>NUMBER</u>		<u>PAGE</u>
1.	Kodiak Island Borough Population (1960-1975)	12
2.	1974 Civilian Age Distribution	13
3.	1974 Civilian Population by Location	13
4.	Projected Total Population of Kodiak Island Borough, Without OCS Activity	17
5.	Locational Distribution of Projected Population, Without OCS Activity	17
6.	Projected OCS-Related Population	18
7.	Projected Police Staff Requirements, City of Kodiak, Without OCS Activity	48
8.	Projected OCS-Related Police Staff Requirements	49
9.	Projected Fire Department Staff Requirements, City of Kodiak Without OCS Activity	49
10.	Projected OCS-Related Fire Department Staff Requirements	50
11.	Projected Urban Area School Requirements Kodiak Island Borough, Without OCS Activity	50
12.	Projected OCS-Related School Requirements, Elementary and Junior High School Classrooms	51
13.	Projected OCS-Related School Requirements, High School Classrooms	51
14.	Principal Design Characteristics for Streets and Highways in the Kodiak Urban Area	59

I. INTRODUCTION AND SUMMARY

The direct impetus behind this study has been the need to plan for the social, economic and governmental impacts expected to occur during the Outer Continental Shelf (OCS) oil exploration and development program off Kodiak Island. The OCS program has been mandated by the federal government because of the vital importance of oil to the nation's economy. At the same time, both the federal and state governments have acknowledged the need for community planning to deal with the local effects of OCS activity and have given financial and technical support to this planning effort.

Because the national interest is involved, the Kodiak community is unlikely to persuade the federal government to cancel the OCS lease sale for the Western Gulf of Alaska, now scheduled for 1980. However, the community can play a very significant role in deciding how the OCS program is carried out in Kodiak. In particular, the Kodiak Island Borough can exert a powerful influence over on-shore development by exercising the area-wide planning powers granted to it by the Alaska Statutes.

The Regional Plan and Development Strategy is intended to help the Borough to exercise these area-wide powers by bringing all necessary elements of the Borough comprehensive plan up to date. The core of the comprehensive plan is a set of long-range policies for the physical development of the Kodiak community. In developing these policies, a number of issues have emerged; OCS activity is important among these, but is by no means the only major issue. Other significant issues include the potential for expansion of the bottom fish industry and the stability of Pillar Mountain. These and other issues have all helped to shape this plan.

Kodiak Planning Program

The present study is the third step in a four-step Kodiak Island Borough planning effort dealing with long-range policy issues and OCS development:

1. OCS Impact Study
2. Marine Facilities Study
3. Regional Plan and Development Strategy
4. Management Study

A brief review of the Borough planning program will help to provide the context for this study.

1. OCS Impact Study. The Kodiak Island Borough Outer Continental Shelf Impact Study was completed by Simpson Usher Jones, Inc., in September, 1977. Its purpose was to provide working estimates of the probable levels of oil industry activity, both off-shore and on-shore, and a baseline inventory of community utilities, services and facilities in the Kodiak Island Borough.

As an extension of this study, Simpson Usher & Jones also prepared Village Sketch Plans for Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie and Port Lions, as well as the unincorporated community of Bells Flat. These plans

are in the process of being revised, amended and adopted by the villages, with help from Borough staff. It is recommended that these be incorporated with the plans for the urban area in one publication when all the plans are adopted.

Another separately reported element of the OCS Impact Study was a set of Draft Goals and Objectives for the Kodiak Island Borough based on a community attitude survey. This document is also being reviewed and amended prior to official adoption by the Borough Assembly. Finally, Simpson Usher & Jones also compiled a map of existing land use in the Kodiak urban area and prepared a sketch plan for future land use as a starting point for discussion of land-use alternatives in the urban area. These two maps are reproduced in the present report.

2. Marine Facilities Study. The Borough commissioned Woodward-Clyde Consultants to evaluate and rank possible sites for OCS-related marine facilities. This study was also completed in September, 1977, and its final title is Oil Terminal and Marine Service Base Sites in the Kodiak Island Borough. The four elements covered in the study are 1) potential demand for such facilities, 2) potential site locations, 3) geotechnical and environmental evaluations of these sites, and 4) site rankings and examination of interest group preferences.

As the final title indicates, the study concluded that marine service bases and oil terminals are the only OCS marine facilities likely to be built in the Kodiak Island Borough. Sites for these two types of facilities were ranked for biological impacts, socio-economic impacts and development costs. Various weighted combinations of these rankings were examined to see how sensitive overall site ranking is to the viewpoint of the group doing the ranking. The conclusions of the study indicate that several of the sites with low biological and socio-economic impacts - relative to other Kodiak sites - appear also to be feasible from a cost standpoint. In short, it appears that there is a range of feasible sites for both types of facility and that the Kodiak Island Borough will be able to influence OCS siting decisions. The most feasible sites, combining cost and impact considerations, are indicated on Map 2.

3. Regional Plan and Development Strategy. This is the present study. The degree to which control of any type of development is successful (and even legal) is in large part dependent on the clarity of community policy towards overall physical development. Therefore, the desire to control on-shore OCS development in the best interests of Kodiak has led to the necessity and opportunity of updating the comprehensive plan as the framework for control of all physical development in the Kodiak Island Borough. For this reason, the Regional Plan and Development Strategy has gone beyond OCS activity to examine a broad range of issues that affect the future of Kodiak.

4. Management Study. Following the completion of the Regional Plan and Development Strategy, the Kodiak Island Borough intends to undertake a fourth and final OCS-related planning study in cooperation with other local governments and groups such as Koniag. It will identify interests, roles and responsibilities among these groups, related specifically to OCS development. The intent will be to develop a unified working approach in the Kodiak community toward on-shore OCS facilities and related development.

Summary

The major findings of the Regional Plan and Development Strategy regarding present conditions in the Kodiak urban area are that the economy of the Kodiak urban area, based upon the fishing industry and the Coast Guard Support Center, is strong and growing. At present, however, housing is expensive and in short supply and certain Kodiak utilities and community facilities are seriously strained. These shortages in services and housing have adverse social and environmental effects, including surface water pollution, dust, periodic water and power shortages, high prices, overcrowded housing, and development in hazard areas. This study recommends that the Borough and other local governments work toward reducing these shortages in housing and community services. Significant expense and effort will be required to do this, but both the effort and the expense can be reduced if services are concentrated in the existing Kodiak urban area.

Looking beyond present conditions, there are three major areas of uncertainty that complicate planning for the future of the Kodiak community. These are OCS activity, the bottomfish industry, and the Pillar Mountain landslide.

The OCS lease sale for the Western Gulf of Alaska was to have occurred in 1978. It has been postponed to 1980 or possibly even later. When the lease sale occurs, petroleum exploration activity will commence, but development and production activities will still be uncertain. The findings of this study are that on-shore employment associated with OCS oil exploration and development could seriously aggravate existing socio-economic problems in the urban area, particularly if an oil terminal were constructed near the urban area. Construction of a terminal could cause a short-term influx of construction workers into the community. A sudden population boom would require expansion in services that the boom would be too short-lived to finance. The boom would also drive prices and wages up, which could well force the fish-processing industry to move out of Kodiak. The result could easily be a post-boom depression. Yet if oil is found, the Kodiak Island Borough will probably have to allow an oil terminal to be built somewhere in the Kodiak Archipelago. Siting of the facility can be crucial in determining impacts.

From a socio-economic viewpoint, oil terminal development should be sited well away from both the urban area and the villages. Permission for a specific proposal should be subject to the conditional use procedures developed in the revised draft of the Borough zoning code and development should be directed to sites identified in the Management Study. Permission should also follow only after a complete environmental review and should be conditioned on the developers' assumption of responsibility for all utilities, services and community facilities for temporary and permanent work forces.

As opposed to OCS development, the bottomfish industry holds out the promise of significant development in keeping with Kodiak's present economy and community preferences. Development of this fishery would help to reduce seasonal unemployment in the community and it appears that Kodiak could attract many of the jobs involved--if it can provide the space and services necessary to the industry.

A very recent report to the Alaska Legislature by the Interim Committee on Resource Matters, titled The Potential for Expanding Into an Alaskan Bottomfish Industry (January 1, 1978) notes that the stated purpose of the federal 200 mile limit extension is "to encourage the development of fisheries which are currently underutilized or not utilized by United States fisheries, including bottomfish off Alaska" (p. 3, emphasis added). The potential benefits to communities such as Kodiak would be increased if shore-based processing is generally adopted (NEFCO has installed an experimental processing line at Gibson Cove). The report identifies some of the community "infrastructure" requirements associated with on-shore bottomfish processing plants (pages 85 and 86) also mentioned in this study and observes that Kodiak is a "prime immediate location" for such plants. However, many economic aspects of the prospective American bottomfish industry are still unresolved. The report ends with proposed study legislation designed to provide some of the issuing information. In the meantime, Kodiak would be well advised to try to resolve issues such as water supply, expanded harbor facilities and space for waterfront industry in order to be able to continue to attract fishery development as it occurs.

The third area of uncertainty in the future of the Kodiak urban area is unfortunately also connected with the expansion of waterfront industry in the Inner Harbor area. This is the Pillar Mountain Landslide. The potential instability of this area above the City of Kodiak dock and cargo terminal facilities is described in this study. It is more thoroughly detailed in U.S. Geological Survey open file report number 78-217, Pillar Mountain Landslide, Kodiak, Alaska (1978) by Reuben Kachadoorian and Willard Slater. The open file report makes it clear that the landslide "is a potential hazard to the City of Kodiak and its environs and merits a thorough investigation and evaluation."

According to the report, the degree and extent of the hazard cannot be identified without a more detailed investigation. That investigation is absolutely necessary for informed and responsible decisions on development in the Inner Harbor area. Lives, property, and the future economic well-being of the Kodiak community are at stake. Furthermore, the open file report has been released, federal and state agencies are aware of the problem, and support for projects in the Inner Harbor area is likely to be conditioned on performance of the detailed investigation. Certainly, a detailed geotechnical study of the mountain must be carried out before any expansion of the existing City dock and cargo facilities can be undertaken. Depending on the outcome of the geotechnical study of Pillar Mountain, it may be in the Kodiak community's interest to encourage development of an OCS marine service base in conjunction with new community docking facilities. To be prepared to evaluate or even to initiate this type of proposal, the community will need to pursue a detailed examination of the economic and operational feasibility of alternative dock facility locations.

In conclusion, this study identifies a number of actions which the community can and should take to plan the orderly future development of Kodiak. In addition, the community can also deal with the three major areas

of uncertainty by 1) preparing to control the course of OCS development, if it occurs, 2) preparing to grasp the opportunity of assisting in the development of the bottom fishery, and 3) beginning the resolution of the Pillar Mountain issue by obtaining the geotechnical information which is a precondition to informed action.

II. ECONOMY AND POPULATION

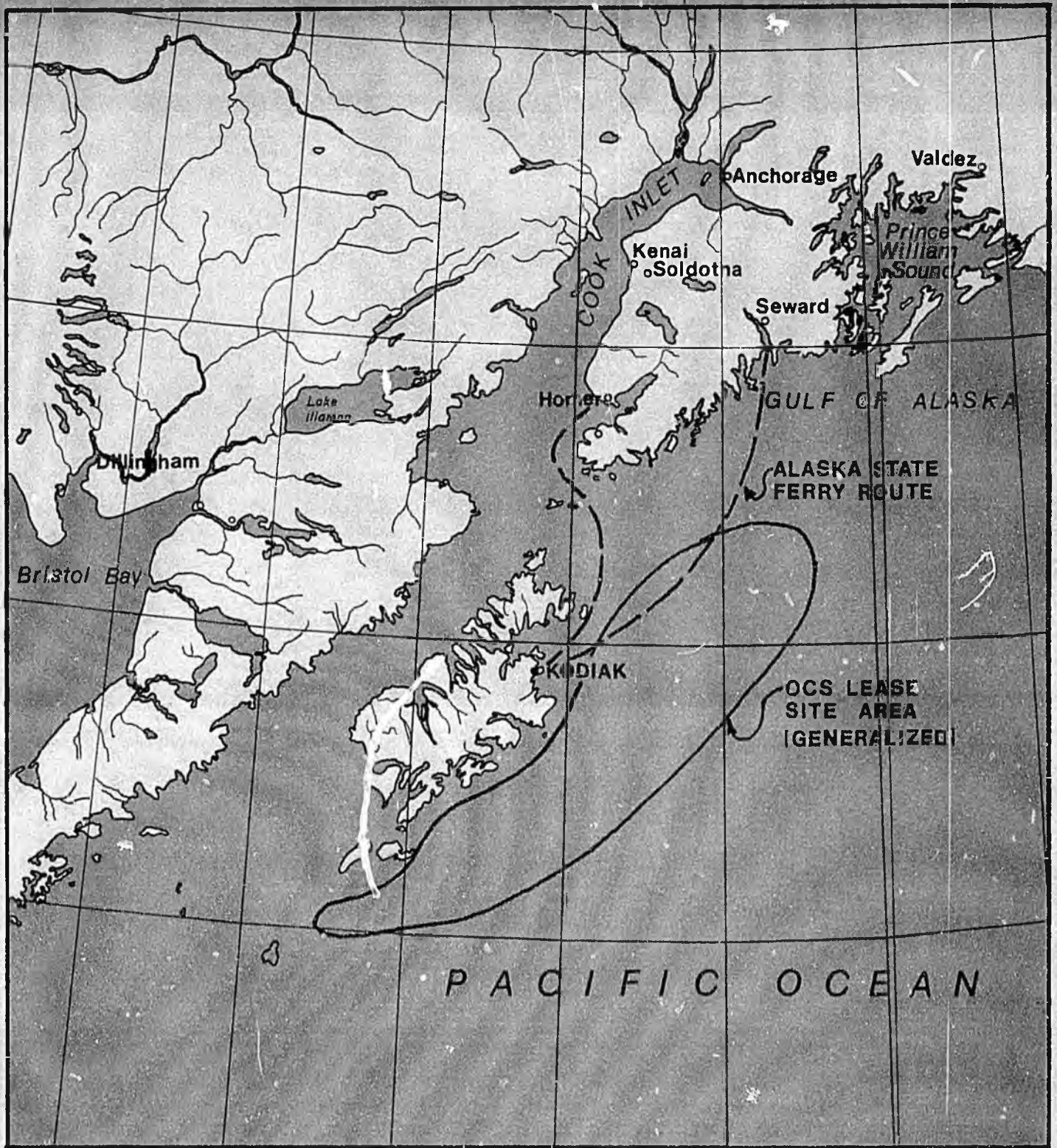
The first step in planning for the future development of the Kodiak Island Borough is to examine existing economic and community patterns in the Borough. This step has been carried out in the Kodiak Island Borough Outer Continental Shelf Impact Study described in the previous chapter. That study, in two volumes, is the inventory upon which the regional planning effort has been based. As such, the OCS Impact Study is a companion document to this report and will not be duplicated here. A brief review of the regional setting and of Kodiak communities will help to put this planning effort into perspective, however.

The Kodiak Island Borough is the overall governmental unit for the Kodiak Archipelago. Map 1 illustrates the regional location of the Archipelago. The Kodiak urban area serves as a subregional center and transshipment point for the western third of Alaska's Southcentral Region, including the Aleutian chain. Kodiak's marine orientation is evident on this map, which also indicates the general area of the proposed Western Gulf OCS lease sale.

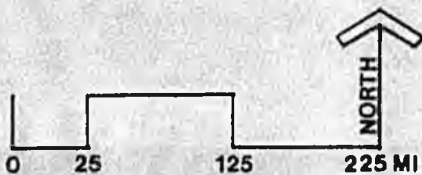
Map 2 indicates the established communities present in the Borough. In addition to the City of Kodiak, there are six smaller, incorporated jurisdictions: Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie and Port Lions. These are the "villages." The map also indicates the most feasible sites for OCS on-shore facilities identified in the report, Oil Terminal and Marine Service Base Sites in the Kodiak Island Borough, by Woodward-Clyde Consultants. That report is also a companion volume to this study.

In addition to the villages, two unincorporated rural settlements presently exist on the road system south and east of the urban area: Bells Flat and Chiniak. These are indicated on Map 3, along with the urban area and the Coast Guard Support Center.

A fourth map has been provided to display the spatial relationship between the Support Center, the City of Kodiak, and the balance of the urban area. Several facilities and sites of particular importance to the Kodiak urban area are also indicated, for later discussion.



REGIONAL LOCATION



Base prepared by Simpson,
Usher, Jones, Inc.

kodiak island borough
regional plan and development strategy

Base prepared by AEDC from USGS maps

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Kodiak island borough regional plan and development strategy

KODIAK COMMUNITIES AND POTENTIAL OCS SITES

- * OCS Sites
- Community

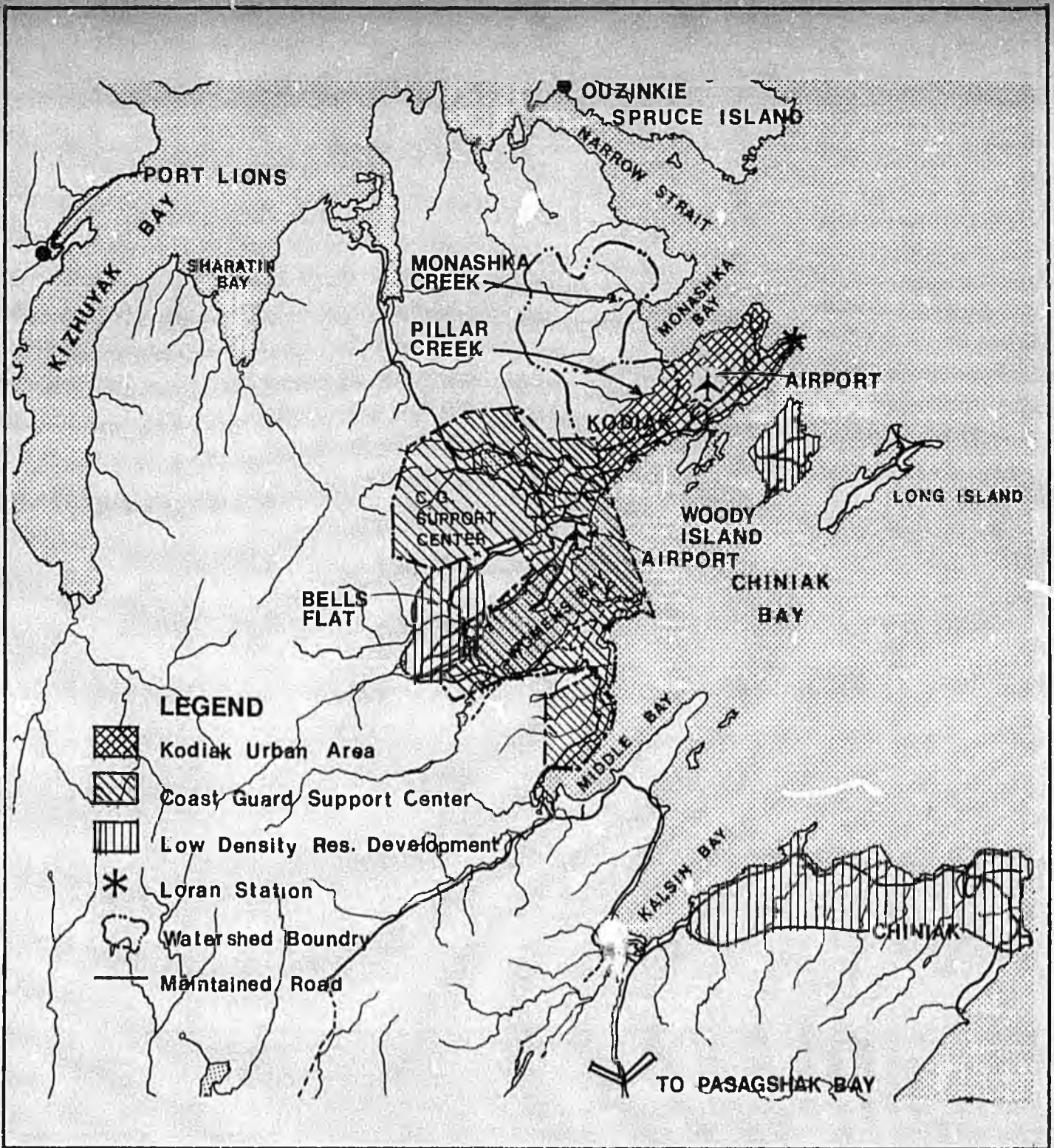
LEGEND



GULF OF ALASKA

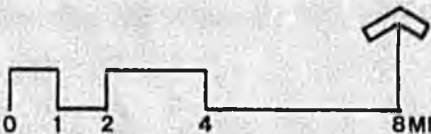
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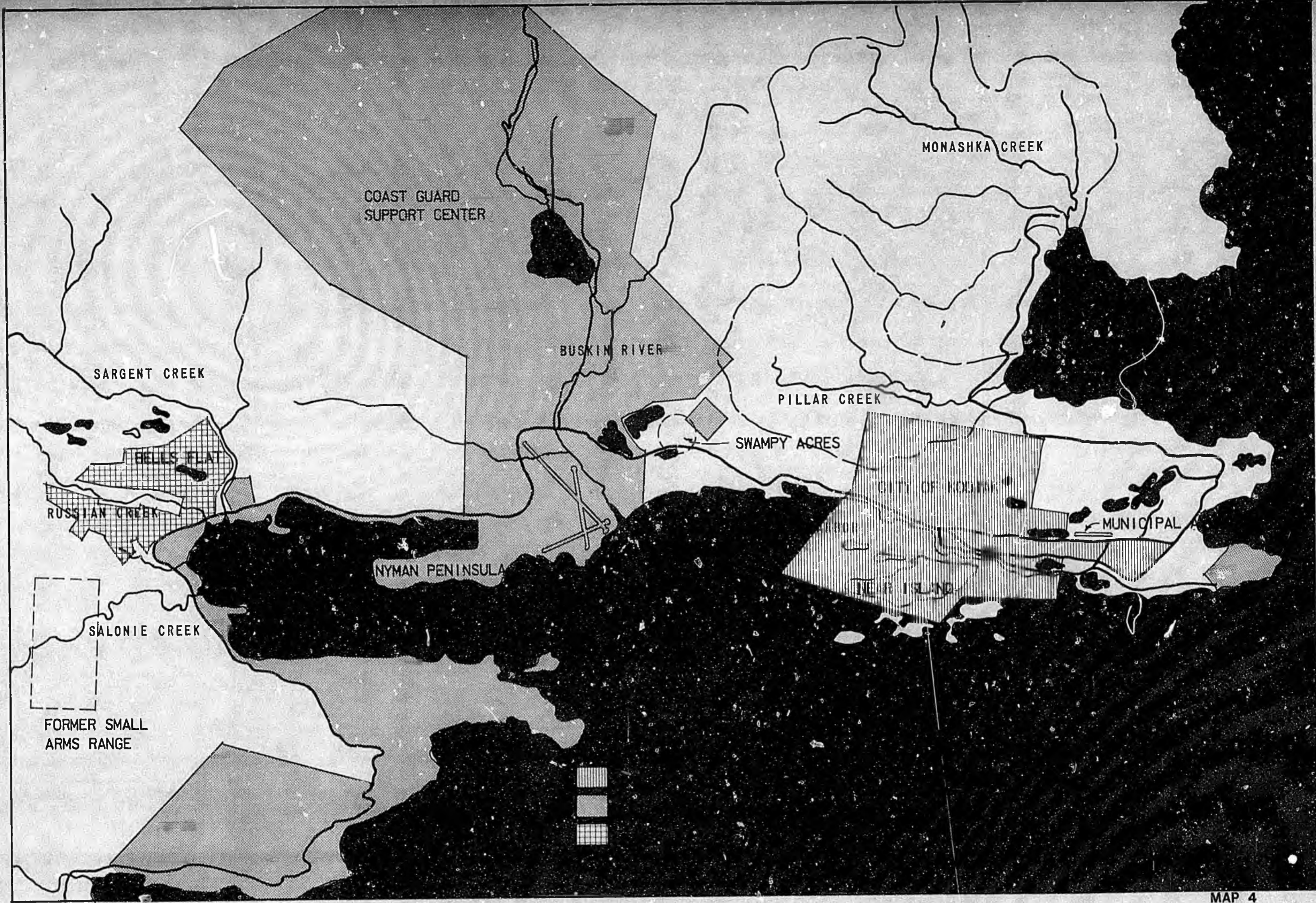
STRAIT



KODIAK ISLAND ROAD NETWORK

kodiak island borough
regional plan and development strategy





COAST GUARD
SUPPORT CENTER

MONASHKA CREEK

SARGENT CREEK

BUSKIN RIVER

PILLAR CREEK

BELLS FLAT

SWAMPY ACRES

RUSSIAN CREEK

CITY OF KODIAK

MUNICIPAL

NYMAN PENINSULA

ISLAND

SALONIE CREEK

FORMER SMALL
ARMS RANGE



Historical Perspective

After examining existing conditions, the next planning step is to identify the future trends and development patterns that would be likely if no actions were taken to shape them to community desires and needs. Examination of historical trends is a good starting point for doing this.

Between 1960 and 1975, the total population of the Kodiak Island Borough grew from approximately 7,200 to approximately 8,700 persons. That represented an average annual compound growth rate of 1.3% for the 15-year period. When we look at these population figures more closely, however, we find that it is important to distinguish between the military and civilian components of the total population. The official figures are somewhat deceptive because "military population" represents manning levels at the Coast Guard Support Center (formerly the Navy Base). The civilian population figures exclude military personnel, but do include military dependents. Even using these definitions, civilian population increased by an average annual compound growth rate of +2.6% between 1960 and 1975, while military population during the same 15-year period declined at -4.9% (see Table 1).

Over the entire 15-year period, civilian population grew steadily throughout the 1960's and remained relatively stable between 1970 and 1975. Military population, on the other hand, declined steadily throughout the 1960's and on until 1972, as a result of the gradual phase-out of the Kodiak Naval Base. In 1972, the Coast Guard took over the Kodiak base from the Navy, and the military stopped declining and began to show a slow increase. Note that there is some disagreement over the population estimate for 1975.

TABLE 1

Kodiak Island Borough
Population (1960-1975)

<u>Year</u>	<u>Civilian Population</u> (1)	<u>Military Population</u> (2)	<u>Total Population</u>
1960	5,367	1,807	7,174
-----	-----	-----	-----
1967	7,652	1,693	9,345
1968	8,020	1,500	9,520
1969	8,200	1,670	9,870
1970	7,918	1,491	9,409
1971	8,422	1,301	9,723
1972	8,044	659	8,703
1973	8,178	690	8,868
1974	8,499	733	9,232
1975	7,901	847	8,748(3)

Average Annual Compound Rate of Growth

1960-75	2.6%	-4.9%	1.3%
1960-70	4.0%	-1.9%	2.8%
1970-75	0.1%	-10.0%	-1.6%

Source: Alaska Department of Labor, Current Population Estimates

(1) Includes military dependents.

(2) Manning levels; dependents not included, Coast Guard personnel replaced Navy personnel in 1972.

(3) Simpson Usher Jones estimate = 9,620, based on actual school enrollment for 1975.

The age distribution of the Kodiak population has been reasonably stable over this period. (1) In a special census taken of the civilian population in 1974 - not including military dependents living on the Support Center - the distribution was this:

TABLE 2

1974 Civilian Age Distribution

<u>Age</u>	<u>Number</u>	<u>Percent</u>
1-5	555	9%
5-17	1805	28%
18-55	3554	55%
55+	490	8%

Note the large percentage of school-age children.

The locational distribution of population has also remained quite stable. That is, village population has remained stable and growth has occurred in the Kodiak urban area. The 1974 special census counts are summarized here, with all residents of the Support Center again excluded. The "remainder" category includes the Mission Road area (outside City limits) and the Chiniak and Uganik census tracts.

TABLE 3

1974 Civilian Population by Location

<u>Census Tract</u>	<u>Number</u>	<u>Percent</u>
Kodiak	3700	57.8%
Ouzinkie	180	2.8%
Port Lions	243	3.8%
Akhiok	102	1.6%
Karluk	94	1.5%
Larsen Bay	98	1.5%
Old Harbor	304	4.7%
Remainder	1683	26.3%

(1) pp. 141-142, Vol. 2, Simpson Usher Jones, Inc., Kodiak Island Borough Outer Continental Shelf Impact Study, 1977.

Future Sources of Economic Growth

Evidence of population growth is ready at hand in the Kodiak urban area: high rents, low vacancy rates, and strained community services. The key factor pushing Borough population up is growth in the existing Kodiak economic base. Before projecting future population levels, with or without OCS development, it is important to briefly examine key sectors of the Kodiak economy to see if future growth in these sectors is likely to occur. The primary and most likely sources of growth fall into the following categories: (1) fisheries development, (2) military, (3) tourism, (4) forestry, and (5) OCS exploration and development.

At the present time, fisheries activity in Kodiak centers around king crab, tanner crab, shrimp and salmon. The traditional basis for fisheries activity in Kodiak has been the salmon harvest. During the early 1970s, the salmon harvest fell off significantly; but, since 1974, it has started to stabilize. In the future, the salmon fishery is expected to be stable or even show some limited growth. The king crab fishery has been relatively depressed for the last several years, partially as a result of over-harvesting during the 1967 through 1969 period. The king crab growing cycle is approximately eight years. Consequently, the stock should begin to show recovery in 1978 and support a stable fishery on a sustained yield basis. Tanner crab harvests are already on a sustained yield basis and should also be relatively stable in the future. The shrimp fishery is relatively new to Kodiak and has been growing steadily. The worldwide market demand for shrimp is strong and is projected to remain so throughout the future. Consequently, this part of the Kodiak fisheries industry will probably continue to show moderate growth, if overfishing is avoided.

A major potential source of growth in the fisheries industry is the harvesting and processing of bottom fish. The bottom fishery requires year-round fisheries activities and cou'ld act to deseasonalize employment fluctuations in the industry. As a result of the 200-mile limit extension in both the Soviet Union and the United States, there is little open area left for foreign fishing in the Bering Sea. Although specialized gear is required for this fishery, the shrimp fleet operating out of Kodiak probably can be modified to engage in this activity. Experimental fishing and processing activities are now testing the economic feasibility of American utilization of this fishery.

The expectation of most industry representatives is that the bottom fishery will become a major source of growth in the Kodiak area. Detailed study of the economic prospects of alternative means for developing this fishery are beyond the scope of this study. Nevertheless, it should be noted that one of the major objectives behind the 200-mile limit extension was to provide economic stimulus to the American fishing industry. It is therefore reasonable to expect that implementation of the limit and associated fisheries management measures will be in part carried out to enhance the industry's prospects. It is also assumed that if Kodiak decides to make the effort, it can capture a significant portion of this fishery.

The growth of civilian economic activity in the Kodiak Island Borough has been offset by the decline in military activity resulting from the closure

of the Kodiak Naval Base. Since the Coast Guard took over the base, military employment has increased moderately. On the basis of current plans, future employment at the Kodiak Coast Guard Base will be stable or increase very slightly. Consequently, the military impact on Kodiak's economy should be either neutral or slightly positive - contrasted with the negative impact of Navy withdrawal, which occurred from 1960 to 1972.

It appears that Kodiak has some potential for the growth of tourism. The Kodiak Chamber of Commerce has created a "visitors and convention bureau" (with a budget of approximately \$50,000) for the purpose of seeking conventions and the development of pre-convention tours in conjunction with the City of Anchorage. Tour ships have begun to visit the urban area, and by 1980 it is possible that there will be as many as 15 or 20 tour ships visits each year. Over the next ten years, it appears feasible that tourism could grow to the point of generating 1.0-1.5 million dollars in gross revenues annually. If this type of development is pursued successfully, it can be expected that retail trade and services will expand more rapidly than they have in the past. However, tourism tends to be a low-wage, seasonal industry. Extensive development of this industry could exaggerate the undesirable seasonality of the existing Kodiak economy.

In the past, the lumber and wood products industry has not been a significant contributor to either the employment or income base of the Kodiak economy. The Afognak Lumber Company has begun harvesting timber on Afognak Island, and it appears that forestry activity could grow moderately. The Kodiak Native Association is working to establish a Native-owned and operated forest products industry for both harvesting and processing of lumber. The primary incended market would be the local construction industry. Given the current shortage of housing and assuming growth in general employment and population, it seems quite possible that a small scale integrated lumber and wood products industry could develop in the Borough and begin contributing jobs and income to the area's economic base.

Considering all four economic sectors just discussed, the Kodiak Island economy can be expected to show a stronger period of growth during the last half of the 70s than was evident during the first half. This would be true even without the introduction of OCS oil exploration and development activity.

Should OCS oil exploration and development occur, it could produce substantial increases in employment and income. However, Kodiak's economy is different than most other areas of Alaska where OCS impacts are anticipated. In most Alaskan communities, the trade-off is between environmental quality and economic (OCS-related) growth. In Kodiak, the physical limitations of inadequate housing, water supply, power generation, roads and shortages of certain types of land could prevent economic growth which might otherwise be expected to occur. If OCS development occurs, it will put additional strains on all these systems. Consequently, the trade-offs between OCS development involve not only environmental quality but also the continuation of the Borough's civilian, non-OCS-related economic growth.

A major existing sector of the Kodiak economy may be particularly vulnerable to OCS impacts - the food processing industry. The most critical factors for the food processing industry in Kodiak are: (1) the availability of labor, (2) the cost of labor, (3) housing supply available for seasonal

labor, and (4) the availability of electric and water utility services. If major on-shore OCS development occurs in the urban area, all of these factors will be affected. Since the community probably does not have the ability to prevent on-shore development on Kodiak, the challenge is to minimize the adverse impacts of OCS development by careful siting and management.

Future Population Forecasts

Working estimates of future population levels in the Borough are necessary to identify future requirements for community facilities, choose desirable land use patterns, and devise an appropriate strategy for dealing with OCS development. The critical period will be the years immediately ahead. Serious oil exploration efforts are likely to begin in 1980; if oil is found, peak development activity will probably occur around 1985. This is also the most useful period for planning local capital expenditures. Forecasts beyond this period are provided for the long-term view; by 1995, OCS activity is likely to dwindle to relatively small production crew operations.

Several methods are available to forecast future population growth in the Borough. One of these is the "component" method, by which birth rates, death rates, and migration rates are estimated from past records. These are then applied to a base year population and extrapolated into the future. This technique was used in the OCS Impact Study.

An alternative means of forecasting population, used here for comparison, assumes that over time, population adjusts to the availability of employment opportunities and the number of persons in the population who are actively seeking employment. In other words, in a small area such as the Kodiak Island Borough, the primary determinant of population change is the demand for workers. If the demand for workers consistently exceeds the ability of the local population to meet the demand, people will migrate into the area. Conversely, local residents will migrate out of the area rather than tolerate prolonged periods of unemployment. Therefore, the "labor force participation" method projects future population from labor force and employment trends.

The primary difference between the two projections is the assumption in the OCS Impact Study that future migration will continue at a rate approximating that of the past five years. On the other hand, the reasoning of the second method is that economic growth (reflected in employment and labor force) will be more rapid than it was in the past, now that the decline in military population has been arrested. As a consequence, it is believed that the rate of in-migration to the Borough will be significantly greater in the future than it was in the immediate past. Both forecasts represent baseline forecasts of population and do not include potential OCS population impacts.

Both forecasts have been used in this study to define the range of likely future population. ⁽¹⁾ The "component" method is used as the low end of this range, and the "labor force participation" method provides a forecast of maximum likely population growth without OCS development (Table 4).

(1) Detailed descriptions of the two methods used are provided in "Working Paper B, Study Element 1: Economy, Population, Community Services," prepared for this study.

TABLE 4

Projected Total Population of Kodiak Island Borough
Without OCS Development

<u>Year</u>	<u>Low</u>	<u>High</u>
1974 ⁽¹⁾	9,232	9,232
1980	11,370	12,920
1985	13,440	17,180
1990	15,880	21,600
1995	18,770	26,100

(1) Actual population, 1974 special census.

It should be noted that this population growth will not simply happen of its own accord. Both analyses predict levels of population likely if the preconditions of population growth are met. These preconditions involve several factors which are currently in short supply in Kodiak, including housing and industrial waterfront land. An active program of economic development will be needed to overcome these shortages if the Kodiak community decides it wants to continue growing. Should it do so, the likely locational distribution of population is indicated in Table 5. Population at the Coast Guard Support Center is now near its likely maximum and will grow very slowly in the future. Village population has been projected simply from present birth and death rates, assuming net migration to be zero. In this table, the Kodiak Urban Area figures also include Bells Flat and Chiniak.

TABLE 5

Locational Distribution of Projected Population
Without OCS Activity

<u>Year</u>	<u>Villages</u>	<u>Support Center</u>	<u>Kodiak Urban Area--Low</u>	<u>Kodiak Urban Area--High</u>
1974 ⁽¹⁾	1,021	2,828	5,355	5,355
1980	1,130	3,400	6,840	8,390
1985	1,220	3,550	8,670	12,410
1990	1,330	3,710	10,840	16,560
1995	1,440	3,860	13,470	20,800

(1) Actual population, 1974 special census.

Estimates of direct employment likely to result in the coastal zone from OCS activity were developed in the OCS Impact Study. These estimates were developed around four cases or possible outcomes of OCS activity. Case 1 represents oil discoveries of approximately 250 million barrels. This size of development is uneconomical; consequently, after four years of exploratory drilling, no development takes place. Case 2 assumes that 1,200 million barrels of recoverable oil reserves are found. Two methods of developing this volume are evaluated. The first method involves using pipelines to

an on-shore terminal (Case 2a). The second method involves using off-shore terminals (SBM's) requiring no on-shore storage (Case 2b). Case 3 represents development of maximum likely reserves (2,000 million barrels), involving an off-shore oil pipeline and a land terminal.

These employment estimates were used to predict labor force impacts by estimating the number of OCS workers likely to reside in Kodiak. These workers would have a "multiplier" effect on service industries. Adding this to the direct employment figures resulted in total employment estimates. By including persons seeking employment, labor force impacts were identified. Total population impacts were then predicted by accounting for the families of persons in the labor force. (1) These are presented in Table 6.

TABLE 6

Projected OCS-Related Population

<u>Year</u>	<u>Case 1</u>	<u>Case 2a</u>	<u>Case 2b</u>	<u>Case 3</u>
1980	60	170	170	170
1981	80	320	320	530
1982	100	350	200	640
1983	60	460	170	570
1984		240	100	720
1985		440	80	1,910
1986		1,220	210	3,340
1987		2,180	210	1,920
1988		950	280	1,310
1989		830	360	1,420
1990		830	360	1,350
1991		810	340	1,320
1992-1995		770	300	1,280

The location of these population impacts will largely depend upon where OCS activity is located. Clearly, the Borough wants to have a voice in that locational decision. Case 2b is probably representative of the population impacts on the urban area if a service base alone were built within the urban area. Cases 2a and 3 indicate the level of population impacts possible if a terminal were located near the urban area. The peak population impacts in both these cases are due to the large construction crews necessary to build an on-shore oil terminal. It has already been pointed out that OCS development and attendant population growth could seriously conflict with the existing economic base of Kodiak, because of competition for limited labor, housing, goods, and services. This conflict would be greatly reduced if OCS development were self-sufficient and occurred at a distance from existing Kodiak communities.

(1) Again, the methods used are discussed in detail in "Working Paper B, Study Element 1: Economy, Population, Community Services," prepared for this study.

Recommendations

Acknowledge that the fishing industry and the Coast Guard are the long-term base of Kodiak's economy and that the economy is growing. Encourage and maintain the community's existing economic base. Attempt to further stabilize year-round employment in the fishing industry by pursuing development of a Kodiak-based bottom fishery.

Do not actively pursue economic development that would result in increased seasonal employment and corresponding unemployment in the off-season.

Discourage short-term economic development that would threaten the long-term economic base. Minimize the negative effects of such development when it is necessary to allow it to occur.

Pursue diversification of the economic base where not in conflict with the above recommendations.

Job growth causes population growth. If the community wishes to continue economic growth, it should commit to accommodating the population growth that results from economic development, or else it should pace economic development to the community's ability to accommodate population increases.

III. COMMUNITY GOALS AND OBJECTIVES

In the previous chapter we summarized likely future trends in Kodiak's economy and population. We also addressed some basic community service requirements related directly to population size. The next step is to identify desired patterns for the future development of Kodiak. This is done by establishing community goals and objectives. This step is under way; Simpson Usher Jones, Inc. have prepared draft goals and objectives based on the 1977 Borough Community Attitude Survey.

As the draft states, "Without goals planning is aimless; it can accomplish very little other than bring to light problems and needs but cannot arrive at solutions." The draft goes on to note that "It is important for the decision making bodies to be aware of public desires and the degree to which they conflict with factual data so that the finally adopted goals and objectives can accommodate to the greatest extent possible the perceived needs of the public as well as the actual situations as they exist." A number of the draft goals and objectives also appear to conflict within themselves. This is to be expected. For example, Kodiak residents desire housing development to be both inexpensive and on large lots. These two desires are held in common with most Americans. The desires conflict, but this can be translated into looking for the best available buy, with low density as one of the "best buy" criteria.

The draft goals and objectives are now being reviewed and revised by the Borough Assembly, with the help of the Borough commissions. The final adopted goals and objectives will be incorporated into the final Kodiak comprehensive plan. In the meantime, the draft goals and objectives have been used in the development of planning recommendations and are reproduced here for reference. They have been put in the order they are dealt with in this report. Other than this, they have been reproduced exactly as they appear in the Simpson Usher Jones draft.

Primary Goal: To maintain the desirable aspects of the current living environment in Kodiak including the rural atmosphere, the freedom of life styles, and the recreation opportunities. To upgrade and maintain a full range of community facilities, utilities and services that are available in Kodiak. Further, to avoid the adverse effects of rapid population growth including over-taxed utilities, transportation systems and increased costs of living.

Governmental Goal: To provide a full range of governmental services to the residents of the Kodiak Island Borough including utilities, social services, policy direction and administrative services in the most efficient and effective manner possible.

- Objective: Upgrade the existing governmental services within the current tax structure.
- Objective: Avoid duplication between governmental departments and various levels of governments (borough, city, state and federal) by close cooperation and understanding of the functions and limitations of each.
- Objective: Increase the number of services and utilities and facilities provided by the governments on Kodiak Island.
- Objective: To use to the maximum extent possible state and federal financial assistance in providing new services and upgrading existing services within the borough.

Overall Village Goals: To establish and improve communication channels between the villages on Kodiak Island and the Kodiak Island Borough in order to allow for better knowledge and understanding of the problems, needs and potentials of those villages. Further, to help provide the services and facilities needed to upgrade the living environment within the villages without destroying the traditional life styles of the residents.

- Objectives: To establish the position of village coordinator within the Kodiak Island Borough to assist in liaison between the borough government and the villages and their governments and to help in the administration of the city governments in the outlying villages.
- Objectives: To establish a policy of annual visits to all villages by the senior staff of the borough, the borough assembly and the borough planning commission.
- Objective: To prepare a detailed study of transportation needs both within as well as to and from the outlying villages and move to resolve the deficiencies at the earliest possible date.

Objective: To improve the level of law enforcement and fire protection within the villages by a realistic education process and assistance in providing and maintaining safety facilities within the villages.

Economic Goal: To encourage the development of a broader economic base for Kodiak that will provide year around employment and economic opportunities to the existing residents without encouraging an economy that induces a rapid increase in the number of permanent or transient residents.

Objective: To foster the development and growth of the fishing industry in and around Kodiak.

Objective: To encourage growth in the tourist industry in Kodiak.

Objective: To encourage the growth and expansion of the construction industry in order to provide competition in the housing construction industry as well as employment opportunities.

Objective: To avoid the encouragement of growth in the timber and OCS related industries.

Objective: To continually update and implement the overall economic development plan for the Kodiak Island Borough.

Community Services and Facilities Goal: To update the full range of public services in order to provide more consistently efficient utilities, facilities and services to residents of Kodiak Island and further, to plan the expansion of those utilities, facilities and services in order to accommodate future anticipated growth.

Objective: To increase the public water supply in order to provide water services to expanding processing industry as well as to general community growth.

Objective: To upgrade and expand the sewer system to serve a larger area.

Objective: To encourage the development of the Terror Lakes Hydroelectric Project in order to meet the growing demands for electrical power without drastic increases in costs that will be incurred if the electrical power is increased through diesel facilities.

Objective: Encourage proper maintenance and adequate upgrading of the telephone system in order to accommodate the existing population as well as future growth.

Objective: Plan for more effective law enforcement services to cope with the increase in criminal activity that is expected as a result of population growth and economic boom conditions.

Objective: To maintain a high level of fire protection services in the urban area and to increase the fire prevention and fire fighting capabilities of the villages.

Objective: To provide a higher level of animal control through increased facilities and code enforcement.

Objective: Increase the amount of public assistance available to residents of Kodiak who are in need.

Objective: To encourage and assist in the development of additional public and private radio and television services for the residents of Kodiak.

Educational Goal: To continue to provide and upgrade the quality educational facilities within the Kodiak area and plan for expansion for the educational system in order to accommodate expected population growth levels.

Objective: Establish a boroughwide school site selection policy and move to acquire any needed size, space needed upon estimated population growth figures.

Objective: To establish firm standards for school site size and locational criteria.

Objective: To investigate the possibility of joint recreation/school facilities and sites.

Objective: To standardize the criteria for school facilities both within the Kodiak urban area and the village areas.

Objective: To pay increased attention to the educational needs of students from outlying villages.

Transportation Goal: To provide a more efficient internal island-wide transportation system; to improve the transportation facilities within the Kodiak urban area; and to encourage more effective and wider range of transportation alternatives to and from Kodiak Island.

Objective: Develop road maintenance functions throughout the Kodiak urban area.

- Objective: Upgrade existing roads to accommodate the growth of the urban area that has taken place to date and plan for additional upgrading to accommodate anticipated future growth.
- Objective: Investigate the feasibility of alternative transportation modes within the urban area including public transportation, bike paths and trail systems.
- Objective: Investigate the feasibility of the continued operation of the city airport at Lilly Lake and the need to upgrade that airport, if it is determined that should remain in operation. Upgrading of that airport should consider the need to avoid land use conflicts around the airport and safety hazards that could arise.
- Objective: To study alternative modes of island-wide transportation, including the development of a network of outlying dock and mooring facilities that will allow increased reliance by the outlying residents of the island on private boats.
- Objective: Encourage the State of Alaska, Division of Aviation to prepare a master plan for the state airport at Kodiak in accordance with FAA guidelines so that facilities in need of improvement can be identified and upgraded and plans can be made for expansion in order to accommodate future demands.
- Objective: Increase the efficiency of the city dock by providing additional quay area and storage space.
- Objective: Investigate the possibility of expansion of State of Alaska ferry system service to Kodiak including a study of the necessity for improved docking facilities.

Land Use Goal: To work towards eliminating existing conflicts in the land use patterns within the Kodiak Island Borough and to plan for low intensity development that preserves the land use integrity of residential areas and concentrates commercial and industrial development in strategic locations.

- Objective: Develop a capability for stronger, more effective zoning enforcement.
- Objective: Assure in establishing zoning patterns that land use category separations are located along natural and man made boundaries that effectively buffer potentially conflicting land use districts from each other.

Objective: To assure the provision of adequate residential areas to help increase the housing stock at a relatively low density and cost.

Objective: To concentrate commercial development in the downtown area and other strategic locations without encroachment into residential areas.

Objective: To encourage the development of industrial uses in industrial parks.

Housing Goals: To actively work towards alleviating the current housing shortage in Kodiak by fostering the development of residential land and structures and to help the community maintain the existing housing stock in good condition.

Objective: To provide ample residential land so a broad range of residential locations are available to the home buyer and developer.

Objective: To provide, where possible, a full range of utilities to residential properties in order to simplify the process of residential development.

Objective: Encourage the use of state and federal funds to establish housing programs designed to help upgrade and maintain the existing housing stock.

Objective: To encourage the development of new residential areas, the purpose of providing housing to low and moderate income families.

Objective: To investigate the legal and social ramifications of establishing a rent review process in order to avoid artificially escalating housing costs due to an economic boom.

Objective: To discourage the use of mobile homes in the Kodiak area.

Objective: To avoid the development of new residential uses within the downtown area of Kodiak.

Objective: To encourage the development of new housing in existing residential areas.

Recreational and Cultural Goal: To develop a high level of active recreational facilities utilizing existing parks and open space lands.

- Objective: To increase emphasis on development and utilization of recreational lands and decrease the emphasis on recreation land acquisition.
- Objective: To attempt to provide a wide range of indoor recreational facilities to allow for leisure activities in winter months and in times of inclement weather.
- Objective: To continue to maintain the museums and library within the Kodiak area at a high level of effectiveness in order to offer cultural opportunities to residents of the area.
- Objective: To prepare a detailed parks and recreation and open space plan including standards for development of park lands and generalized designation of parks and recreation facility criteria.

OCS Development Goal: To discourage the development of OCS related facilities in and around the population centers on Kodiak Island and, if OCS facilities are located any where on the island, to require that they be concentrated in a limited number of locations as well as be self-sustained at their remote sites.

- Objective: To prepare land use regulations that can effectively control the location of OCS related facilities including indirect and ancillary uses.
- Objective: To prepare and adopt detailed OCS facility location policies and a physical planning process.
- Objective: To encourage the oil industry to participate in funding efforts to mitigate the adverse impacts of their activities on the Kodiak shelf.
- Objective: To establish borough-wide environmental impact review and control procedures applicable to OCS related facilities in order to assure that the natural environment is preserved and enhanced throughout any future period of OCS development.
- Objective: To investigate the feasibility of local government development and ownership of onshore OCS related facilities to be leased the oil industry.

IV. CAPACITY CONSTRAINTS ON DEVELOPMENT

This chapter will identify some key factors which should constrain planning for development in the urban area. These constraints will affect the types and location of land uses as well as the amount of development that can take place without requiring major public investment in new utility systems or other facilities. In order for growth not to have overwhelmingly adverse effects on Kodiak residents, reasonable and realistic limits on the extent and pattern of future development must be identified.

A major question this planning effort is attempting to answer is whether OCS development should be encouraged or even allowed to take place within the urban area (where it could utilize existing services and utility systems) or whether the Borough should pursue a "remote site" strategy and require the oil industry to develop all necessary services and facilities on a completely separate basis. Information such as the amount of developable land within the urban area will help the Borough to decide which strategy is most appropriate. Three types of constraints will be examined: a) natural constraints, which help determine the land areas most suitable for development; b) man-made systems, which represent existing public investments and which may have capacity limits; and c) financial resources, which may limit local government's ability to provide the services necessary to sustain growth, and which also limit the individual resident's ability to obtain suitable housing in Kodiak, however great the employment opportunities.

Natural Constraints

A number of natural factors affect the suitability of land for development. Three have been selected as being particularly significant in the Kodiak urban area: steep slopes (Map 6), water and wetlands (Map 7) and natural hazards (Map 8). By subtracting lands that are already developed, we can map developable lands (Map 9). The already developed lands are indicated on Map 5, existing land use. This mapped inventory was prepared as part of the OCS Impact Study. It was not printed in that report, however, so it is reproduced here.

The degree of slope affects the suitability of land for development in two ways. First, building cost goes up as excavation and earthwork increases; this is a cost borne by the developer. Second, public costs for roads and utilities increase significantly as slopes steepen. Map 6 indicates four classes of slope. Land less than 5% can be considered "flat" for development purposes; site preparation costs are minimized, as are utility costs. This slope class is particularly well-suited for industry, commerce, institutions and the parking areas associated with these uses. Land between 5 and 10% slope is classed as "accessible". Roads and utilities costs, as well as building costs, are moderate. Kodiak winter icing conditions make 10% a reasonable maximum for road gradients. Slopes between 10% and 25% are classed as "buildable", but not readily accessible. This slope class can furnish dramatic homesites, although foundation costs exact a premium. Utility costs are excessive if any extensive area of this slope class must be traversed. Roads require expensive cut and fill; this also tends to cause erosion problems with Kodiak soils, leading to sedimentation in streams and lakes. Lands over 25% slope are classed as "very steep". Road and utility costs are prohibitive and building suitability is questionable due to potential slope instability.

The pattern of tones on Map 6 indicates that the majority of "flat" and/or "accessible" lands occur on the east side of the Pillar Mountain ridge. Slopes flatten out progressively toward Spruce Cap. The very mixed pattern on Near Island is a result of the hummocky bedrock topography there.

The water bodies and wetlands indicated on Map 7 are also important considerations in locating future development. The watershed boundaries define drainage basins that are important for planning wastewater and stormwater drainage systems. The Island Lake drainage basin is the largest in the urban area. Water quality in Island Lake is below state standards for drinking and even for swimming. In order to improve the water quality, sewers must be provided to the homesites in the drainage basin.

Lakes and ponds are important community assets and enhance property values if water quality is maintained. They can also be water sources, along with streams. Streams are also nature's storm drains. If they can be maintained in natural condition, they will provide amenity and recreation as well as utility. Wetlands are part of the natural storm drainage system. They regulate water flow by retaining peak discharges. They also function as natural settling basins in maintaining water quality. For these reasons any proposals to fill more wetlands in the urban area should be examined very carefully. As a general rule, such proposals should not be approved.

Map 8 indicates potential hazard areas due to flooding, tsunami or landslide. The most likely trigger of these events is a major earthquake. Earthquakes are common in Southcentral Alaska, although it is difficult to predict their frequency of occurrence and magnitude. The indicated floodplain area is the area that the Corps of Engineers has identified as likely to be inundated if the dam for the City's Lower Reservoir were to fail catastrophically. Most probably, this would be due to an earthquake. Future residential development should not be permitted in this floodplain. Several houses have already been built in the floodplain along Larch Street, next to Lilly Lake. The new townhouses near the Lower Reservoir were sited to avoid the floodplain. However, a sewer was installed that crosses it. An extension of Selief Avenue in the same area has been discussed. If and when Selief is extended, the feasibility of designing the roadbed to divert all the flow of potential floodwaters to Beaver Lake should be considered.

The tsunami inundation area indicated on the map is a tentative identification, based on the 1964 tsunami(1). The topographic mapping available for this study was based on the USGS datum before the earthquake. Adding together approximately 5-feet for 1964 subsidence, 9-feet for the highest expected tide (above "mean sea level", not "mean lower low water"), 12-feet for the 1964 tsunami crest and 6-feet for wave runup, we might expect a recurrence of the 1964 tsunami to inundate areas up to 32 feet in elevation, measured against the pre-1964 datum. For convenience, the 30-foot contour was followed

(1)Kachadoorian and Plafker, Effects of the Earthquake of March 27, 1964 Communities of Kodiak and Nearby Islands, Professional Paper 542-F, U.S. Geological Survey, 1967.

to establish the tsunami hazard areas indicated on the map. The location and elevation of probable tsunami hazard areas should be confirmed with the U.S. Geological Survey, however. Because land use controls are indicated for hazardous areas, it is also important to have the degree of hazard confirmed. In this connection, the Coast Guard has taken the tsunami potential into account in its recent planning and construction at the Support Center. Residential uses are not located in the hazard zone, a tsunami warning system is in operation, and evacuation plans are posted in all buildings.

The third natural hazard area is a possible slide zone on the east face of Pillar Mountain, between the City dock and the City cargo terminal. A surficial slide occurred here during the construction of the City dock in the early 70's, destroying the state highway. The area has been examined by representatives of the U.S. Geological Survey and the Alaska Department of Transportation and Public Facilities and some degree of movement or slippage detected. On this basis, potential instability has been identified, but the degree and extent of instability cannot be determined without further study. This information is necessary to plan for the future of the Inner Harbor area. The nature and extent of corrective actions - if any are necessary - cannot be identified without this information. In particular, it could affect decisions on the City dock and the cargo terminal, which are essential facilities in the urban area.

As noted, precise identification of two of the three hazard areas is hampered by lack of information at this time. A major geotechnical study of Pillar Mountain should be carried out, with assistance from the federal and state governments. One potential cause of a slide would be a major earthquake, so the likelihood and magnitude of future earthquakes will probably be an element of the study. Since this relates directly to possible future tsunamis, the study should also include an identification of the degree of tsunami hazard and the appropriate topographic elevation for a hazard zone within which land use controls would apply.

The types of restrictions that should be considered have been identified in the regional atlas prepared for Kodiak by the Arctic Environmental Information and Data Center: Kadyak, A Background for Living (p. 137). These controls would also be appropriate to a final slide hazard zone, if any, and to the Lower Reservoir floodplain area:

1. Restriction of land uses to those that are essential, such as docks and warehouses, with owners, builders, and occupants being cautioned on the hazard. Prohibition of siting of high-occupancy and critical structures, for example, schools, hospitals, police, and fire stations.
2. Placement of potential inundation areas under floodplain zoning, prohibiting all new construction and designating existing occupancies as nonconforming.
3. Orientation of structures with their long dimension parallel to the anticipated direction of wave movement.

4. Utilization of natural features such as peninsulas, islands, shoals, or large rock protrusions to act as breakwaters in siting communities or structures.
5. Where economically feasible and without encouraging a false sense of security, construction of restraining or diversion structures to minimize potential inundation.
6. Institution of appropriate systems to warn of impending danger. It is important to note here that tsunami warnings and watch bulletins issued by the Alaska Regional Tsunami Warning System are usually based upon seismic data, as valuable time would be lost if bulletins were issued only after a tsunami registered on tide gages. Consequently, bulletins will at times be issued in cases where a tsunami does not develop.
7. Adoption and implementation of evacuation plans.
8. Elimination of potentially hazardous dams or reservoirs.

In addition, construction activities or resource extraction activities which would tend to increase the likelihood of slope failure should cease in potential slide areas and not be permitted in the future. Rock quarrying on the side of Pillar Mountain, for example, steepens the slope further and could lead to future slides such as the one that destroyed the state highway.

The pattern of developable lands in the urban area has been displayed on Map 9. The purpose of this map is to identify how much developable land there is in the urban area, and where this land is located. This map was produced by combining the maps of existing land use, steep slopes, and water and wetlands. Natural hazards were not included because of the degree of uncertainty on two of the hazards mentioned above. They would have been included if adequate information were available.

Areas considered generally physically unsuitable for development include steep slopes, lakes, ponds, and wetlands. Already developed areas have been indicated with a gray tone (except for street rights-of-way, which have been left blank to display the street pattern). Undeveloped areas that are dry and in the "flat" or "accessible" slope classes are considered highly suitable for development and were also left blank; these can be differentiated from the street pattern by referring to the plat lines superimposed on the map. These undeveloped areas in the "buildable" slope class were considered to be limited in suitability. Several areas which are presently used at low intensity were classed as "transitional" in order to assess their suitability for redevelopment to higher intensity uses. Initially, these were the municipal airport and adjacent lands, including the concrete plant; the spruce cape loran station; the Cry of the Wild Ram site; the existing City landfill; and the VFW site. Of these, the municipal airport and Spruce Cape areas proved to contain significant amounts of land highly suitable for redevelopment from a physical standpoint.

The overall pattern of developable lands is very significant to decisions about the future pattern of development in the urban area. Large amounts of highly suitable land are present. Two major areas stand out: the municipal airport and adjacent lands; and the Rezanof Extension - Spruce Cape area.

Manmade Systems

The manmade systems which constrain the development pattern include certain utilities which are often called "infrastructure" because they are the framework upon which the community is structured. Four systems should be particularly prominent in current Kodiak planning. These are water supply, wastewater treatment, solid waste disposal and electricity.

The existing water system is presented on Map 10. The system has three primary functions. It supplies water for drinking and other residential uses, water for industrial purposes (the current primary user is the fish-processing industry), and water for fire-fighting. All are critical, but the latter is very important in determining the size and location of lines in residential areas. Fire-fighting equipment draws great volumes of water, stressing water mains to the point that line collapse is a very real possibility. To help prevent this and to assure a continued supply of water, mains should be looped to allow two routes of flow to any point. Possible system extensions to accomplish this in present developed areas are indicated on the map. The City Fire Department currently provides fire protection service to the already developed Island Lake and Mission Road areas, but the water supply is not adequate to serve these areas properly. System extension for these areas could easily serve new development along the Rezanof Extension and at Spruce Cape. Looping is also indicated around the airport area to serve existing development.

In addition to affecting the pattern of development, the water supply system affects the amount of development that can be serviced. Current water usage varies from 3.0 - 3.5 million gallons per day (MGD) when the major seafood processors are not operating, to 10 - 12 MGD when the processing plants are in operation (1). Current system storage capacity is inadequate to guarantee supply to industrial users during periods of low stream flow. Potentially, large fish product losses could occur during peak harvests and this could discourage construction of new processing plants. An OCS service base would also require large amounts of fresh water for supply to drill rigs (2). Further economic development will require increasing storage capacity; the most readily apparent alternative is to go ahead with

(1) Personal communication with Herman Beuker, Public Works Supervisor, City of Kodiak.

(2) Alaska Consultants, Inc., Marine Service Bases for Offshore Development, State of Alaska, 1976, p. 35.

raising the Monashka Creek Dam. This is a City facility on disputed land; exercise of the Borough planning powers may help to speed negotiations between the parties.

Currently all domestic wastewater in the urban area is either collected and discharged to saltwater without treatment, or is handled by septic tanks or privies. The City is in the process of constructing a secondary treatment plant which is due to be completed in the summer of 1978. The treatment plant was designed and located to eventually serve the entire urban area. However, the initial service area is defined by the existing wastewater collection system. This is entirely within the City limits, except for a small area along Shahafka Cove and Mission Lake.

The treatment plant is based upon a projected service population of 9500 persons for a design year of 1995. The average design flow for the new treatment plant is 2.13 million gallons per day (MGD). This includes (1) 85 MGD of infiltration and inflow and approximately 0.25 MGD of wastage. If these two components can be reduced, it is possible that the new treatment plant could serve a population somewhat greater than 9500.

The existing wastewater collection system is presented in Map 11. Since present City population is around 4000, considerable expansion of the service population is possible. The Island Lake drainage basin is experiencing water quality problems and is one of the first areas to which service should be extended. Wastewater trunks would logically follow the drainage pattern (see Map 7) with a lift station at Mill Bay. Provision of the interceptor shown in this area would also make wastewater service possible for the undeveloped Spruce Cape and Rezanof Extension areas. The scheme shown here is very similar to one alternative recently proposed to Island Lake residents.

A second logical area for service extension is the municipal airport area. Because of the natural drainage pattern, it could be partially served by the Island Lake extension. A new sewer (shown as a dashed line) has been started to the townhouse development near the Lower Reservoir. This could be extended to pick up the Beaver Lake portion of the airport area. A collector up the Cutoff Road would pick up the remainder of the airport lands.

Solid waste disposal is another public utility which constrains development. It does not usually affect the overall development pattern, but the site of the sanitary landfill itself is critical and may be hard to locate. This appears to be the case in the urban area; suitable soils and drainage conditions seem to occur in very few places. The present City landfill site, for example, is presently inadequate because the scarcity of soil requires rock to be ripped for cover material. This coarse material allows rainwater to percolate into the buried waste, and to leach out pollutants. Drainage is also uncontrolled, so the polluted leachate works back out to surface water courses. The site will be totally inadequate for the disposal

(1) Tryck, Nyman and Hayes, Wastewater Treatment Process Selection (undated).

of sludge from the new treatment plant. It is therefore important that a proper site be located in the next six months, before the plant begins operation.

The Coast Guard landfill at the Support Center is in the same situation. To try to resolve the situation, the City of Kodiak and the Coast Guard recently agreed to consider joint utilization of a single landfill operation and cooperated in a study of potential sites. The site recommended was suitability (refer back to Map 4). Perhaps because it was assumed the Coast Guard had jurisdiction over these sites, the study did not develop comparative cost data for alternative sites. It also did not consider solid waste collection and disposal requirements for the urban area beyond the City limits. Swampy Acres, however, had been exccessed and claimed by a Native corporation. It also appears that the site has considerable potential for industrial development. The new owners are likely to insist that any landfill operation provide them a financial return equivalent to industrial use.

At this point, an apparent impasse has been reached. One major difficulty in deciding a course of action is that the site study does not provide information for a fallback position. The study needs to be updated -- or a new study done -- to fully compare alternative sites, including hauling costs and potential lease rates based on "highest and best use," in order to support decisions and to provide the background for negotiations.

Solid waste disposal is a regional problem in the Kodiak urban area and it is clearly in the interests of all jurisdictions and parties to cooperate. The Borough should take the lead in an immediate study update, involving both the City of Kodiak and the Coast Guard. The Borough is probably also in the best position to negotiate terms of a lease, since it has the zoning and platting powers. If the Swampy Acres site should prove to be the only suitable site, public health considerations would direct that it not be used for another purpose. This must be clearly demonstrated, however. In the interim, planning permission to develop the site for other purposes should not be granted.

Electrical power costs and generation capacity are additional factors that constrain community growth, although they do not have much effect on the spatial pattern of development. Kodiak Electric Association presently relies on expensive diesel generation, to supply the urban area and Bells Flat. It has a "nameplate" capacity of 25,000 KW, compared to a September 1976 peak demand of 9500 KW. ⁽¹⁾ However, the nominal capacity is deceptive, because much of KEA's equipment is old and subject to mechanical problems. The fish-processing industry is a major user of power and expansion will require an adequate, reliable, and affordable supply system. KEA will install a new 7000 KW generator in 1979, but the long-range solution appears to be a hydroelectric project at Terror Lake. The Terror Lake project was

(1) Personal communication with L.H. Johnson, former Manager, Kodiak Electric Association.

delayed because of unfavorable economics when fuel costs were low. With increasing fuel costs, it now appears feasible and KEA is proceeding with planning. Completion could come as early as 1983. The Borough should give KEA any support it can to move the project along.

Financial Resources

By reference to Alaska Taxable, 1976, it is apparent that the City and Borough impose somewhat lower taxes than other Alaskan communities of comparable size. Therefore, if the community desires, it can finance some additional programs and improvements by moderate tax increases. The tax base itself will be increased by economic development, particularly OCS development. Eventually, the tax burden on individual property owners can drop significantly. However, the costs of community facilities for construction workers usually precede the tax base expansion by several years, so there is often an interim period of higher taxes.

The current percentage of indebtedness to valuation in the Borough and City is 6.85%. This is well below the commonly accepted rule-of-thumb maximum of 10%, but is above the state average of 4.42%. It probably reflects a relatively small industrial tax base and relatively high proportion of employment in government. The City's debt service will slightly increase and then remain stable over the next several years. The Borough's bonded indebtedness is primarily for schools and will drop sharply when the state takes over responsibility for school indebtedness in June.

In summation, all these factors appear to indicate that the urban area could probably raise up to five or six million dollars for new capital projects in the immediate future without excessive tax increases. This figure will provide a rough measure of the ability of the community to finance key projects. Most of this sum would probably be available to the Borough rather than the City because of the forgiveness of school debt. If the community were to raise these funds, they would go to projects benefiting the entire tax area, such as parks and schools. Improvement district assessments will have to support much of the cost of needed utility and road improvements, for example.

The financial resources of Kodiak residents should also be considered in planning the pattern of community development. The current shortage of affordable housing emerged as a major concern in the Community Attitude Survey. The reason for concern is apparent when household income distribution figures from the 1970 census are updated for inflation. Approximately 8% of Kodiak households have total incomes of \$30,000 or more; 41% receive between \$17,000 and \$30,000; 51% receive less than \$17,000 annually. The break points are significant. Using an income multiplier of 2.5, a family would need at least \$30,000 income to be able to purchase a home for \$75,000; this is a conservative minimum for new home prices in the urban area. A family would need at least \$17,000 income to purchase a \$42,500 home. This is a conservative minimum estimated price for an older house in the Aleutian Homes area or for a newer mobile home on a private lot.

The \$17,000 household income level is probably also a measure of ability to rent a family-sized apartment unit.

This appears to tell us that only some 10% of Kodiak households can afford large-lot, single-family housing. Another 40% can afford older housing on smaller lots, mobile homes, or apartment rentals. A full 50% of households would appear to have difficulty finding housing on the private market.

How do Kodiak residents cope? Some build their own housing, some have been in their homes for a long time, some are in a limited number of public housing units. But for too many, overcrowding and bad housing conditions appear to be the result. Although statistical evidence of this is hard to produce, it is repeatedly confirmed in discussions with public officials and members of the community. Therefore, while low density residential development may be a desired pattern, sufficient space should be set aside for higher density, affordable housing, such as apartments and mobile homes. An adequate supply of smaller lots with services could also help to bring the cost of homesites down, or at least prevent further speculative inflation.

Priority Development Areas

To more specifically identify portions of the urban area in which higher intensity development can logically take place, 23 neighborhoods were identified in the urban area, plus three more on the road system, using the housing inventory developed in the OCS Impact Study as a starting point. The amounts of developable land in each category were inventoried for each neighborhood. In total, there appear to be some 650 acres of undeveloped, highly suitable lands in the immediate urban area, with an additional 340 acres of transitional, highly suitable lands. There are approximately 320 acres of undeveloped, limited suitability lands and another 180 acres of transitional, limited suitability lands. These areas appear adequate to accommodate even the maximum projected 1995 population entirely within the present urban area, if emphasis is placed on low-rise apartment housing and single-family housing on 7200 square-foot lots.

To provide a graphic illustration of where development might reasonably proceed first, the 23 urban area neighborhoods were prioritized (Map 12) on these criteria:

Undeveloped land;

high	=	more than 50 acres undeveloped
moderate	=	20-50 acres undeveloped, or more than 50 acres transitional
low	=	less than 20 acres developed, or less than 50 acres transitional

Available services;

high	=	existing
moderate	=	near-term future
low	=	long-term future

Suitable land;		
high	=	more than 75% highly suitable
moderate	=	50-75% highly suitable
low	=	less than 50% highly suitable

The areas that emerge as having the greatest potential for immediate development are Baranof Heights, Beaver Lake, Kadiak Subdivision, Outer Mission Road and Mid-Cape.

To verify that projected population increases could be accommodated in the urban area, the lower population projection was distributed by neighborhood (the higher projection also "fit in", however). This area distribution of population is displayed on Map 13. Existing population was estimated from the OCS Impact Study housing count. Future estimates were based on the amount of developable land and preliminary assumptions about housing density. It is assumed, for example, that apartment construction will replace some existing structures in the Downtown and Aleutian Homes neighborhoods, though there is relatively little undeveloped land there.

Recommendations

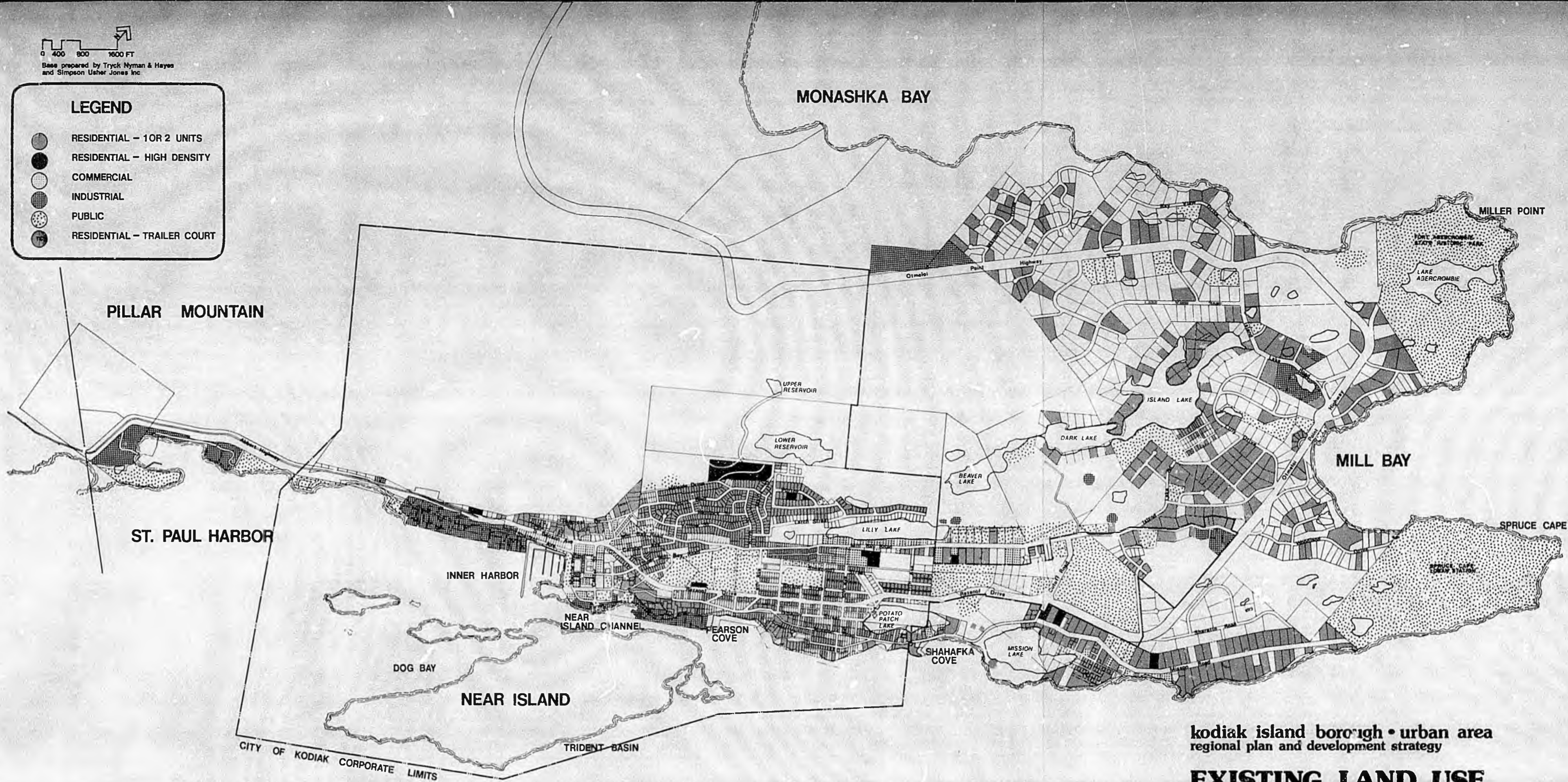
Recommendations bearing upon specific land uses will be found in Chapter VII. Recommendations related to natural constraints are:

- . Request that the federal and state governments conduct a full geotechnical investigation of the stability of Pillar Mountain. The study should identify the degree of potential hazard and the extent of the hazard area, if any. Preventive and corrective actions should also be identified, if applicable, along with the costs of such actions.
- . Request that the geotechnical study also include a determination of the degree of tsunami hazard and the extent of the hazard zone (a maximum elevation may be sufficient).
- . Enact land-use controls for designated natural hazard areas.

0 400 800 1600 FT
 Base prepared by Tryck Nyman & Hayes
 and Simpson Usher Jones Inc

LEGEND

-  RESIDENTIAL - 1 OR 2 UNITS
-  RESIDENTIAL - HIGH DENSITY
-  COMMERCIAL
-  INDUSTRIAL
-  PUBLIC
-  RESIDENTIAL - TRAILER COURT



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 regional plan and development strategy**

EXISTING LAND USE

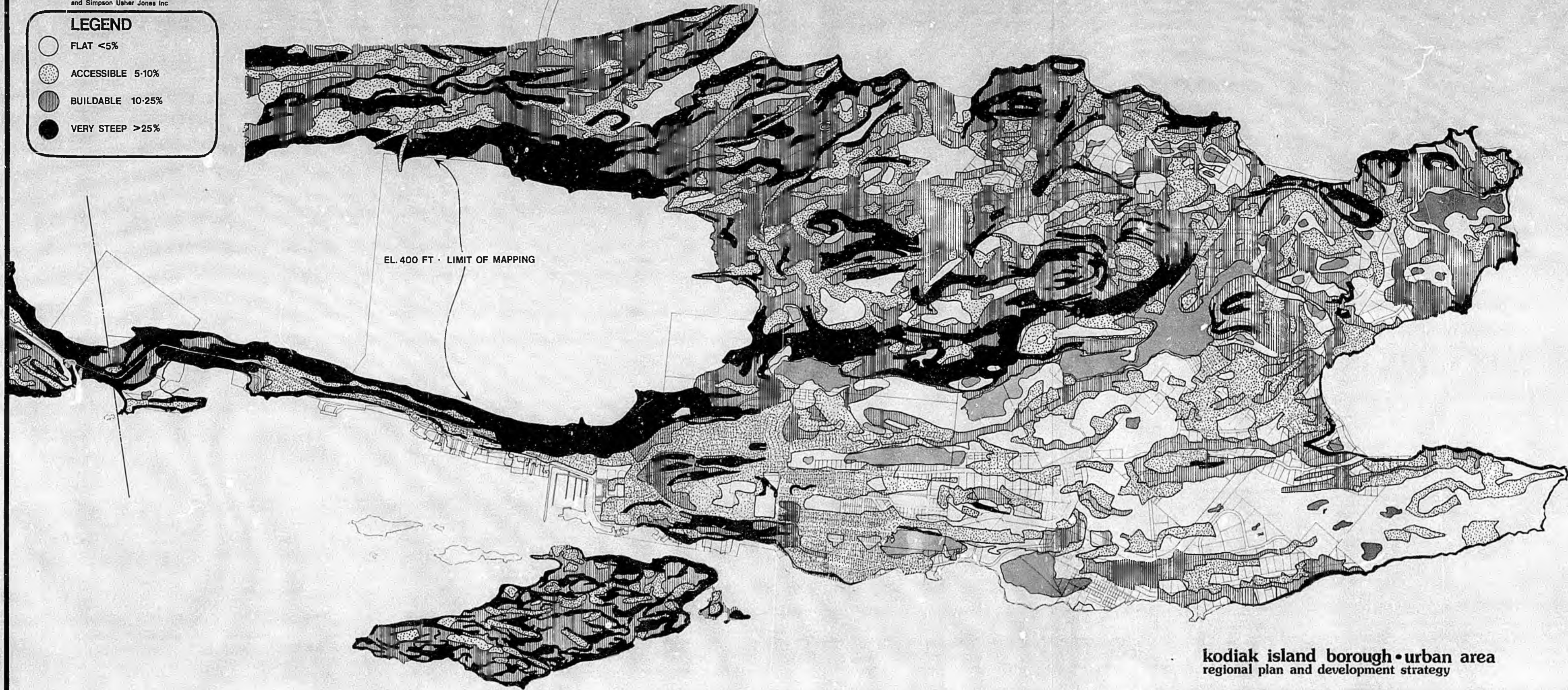
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LEGEND

- FLAT <5%
- ACCESSIBLE 5-10%
- BUILDABLE 10-25%
- VERY STEEP >25%

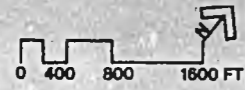


EL. 400 FT - LIMIT OF MAPPING

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STEEP SLOPES

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LEGEND

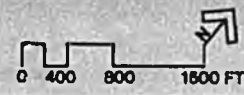
- WETLANDS
- WATER BODIES
- STREAM CHANNELS
- 2 WATERSHED BOUNDARIES



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WATER AND WETLANDS

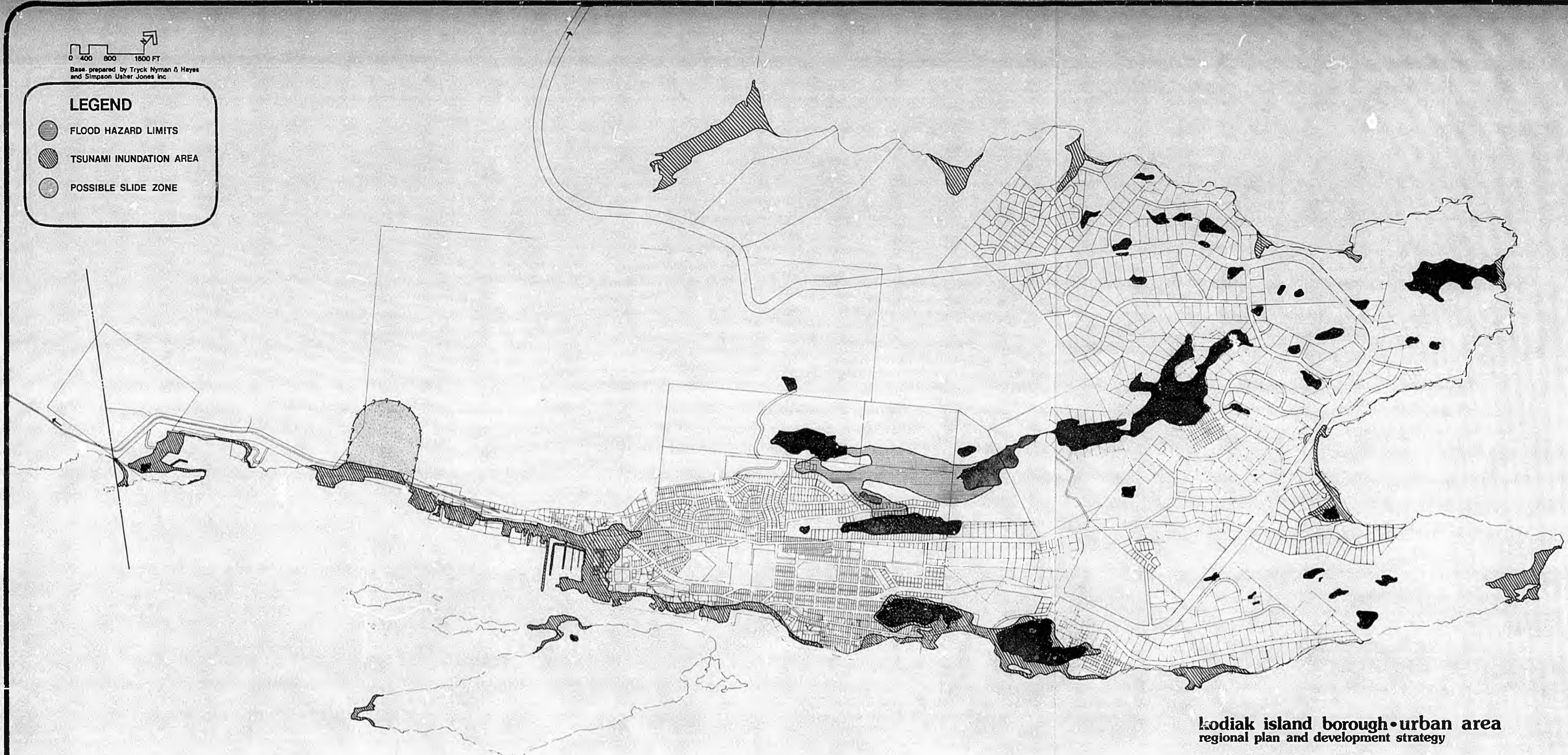
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LEGEND

-  FLOOD HAZARD LIMITS
-  TSUNAMI INUNDATION AREA
-  POSSIBLE SLIDE ZONE



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NATURAL HAZARDS

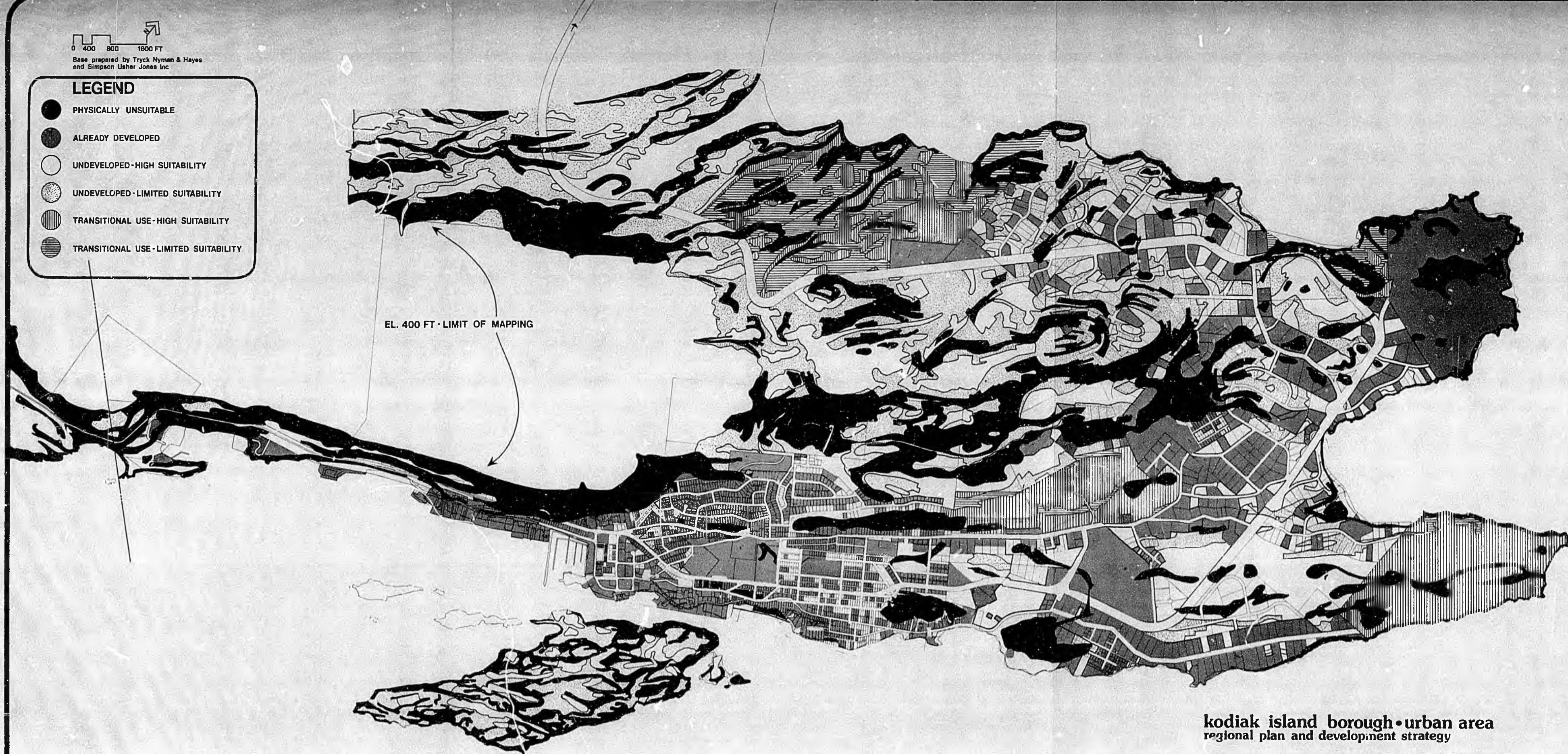
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LEGEND

- PHYSICALLY UNSUITABLE
- ALREADY DEVELOPED
- UNDEVELOPED - HIGH SUITABILITY
- UNDEVELOPED - LIMITED SUITABILITY
- TRANSITIONAL USE - HIGH SUITABILITY
- TRANSITIONAL USE - LIMITED SUITABILITY



EL. 400 FT - LIMIT OF MAPPING

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DEVELOPABLE LANDS

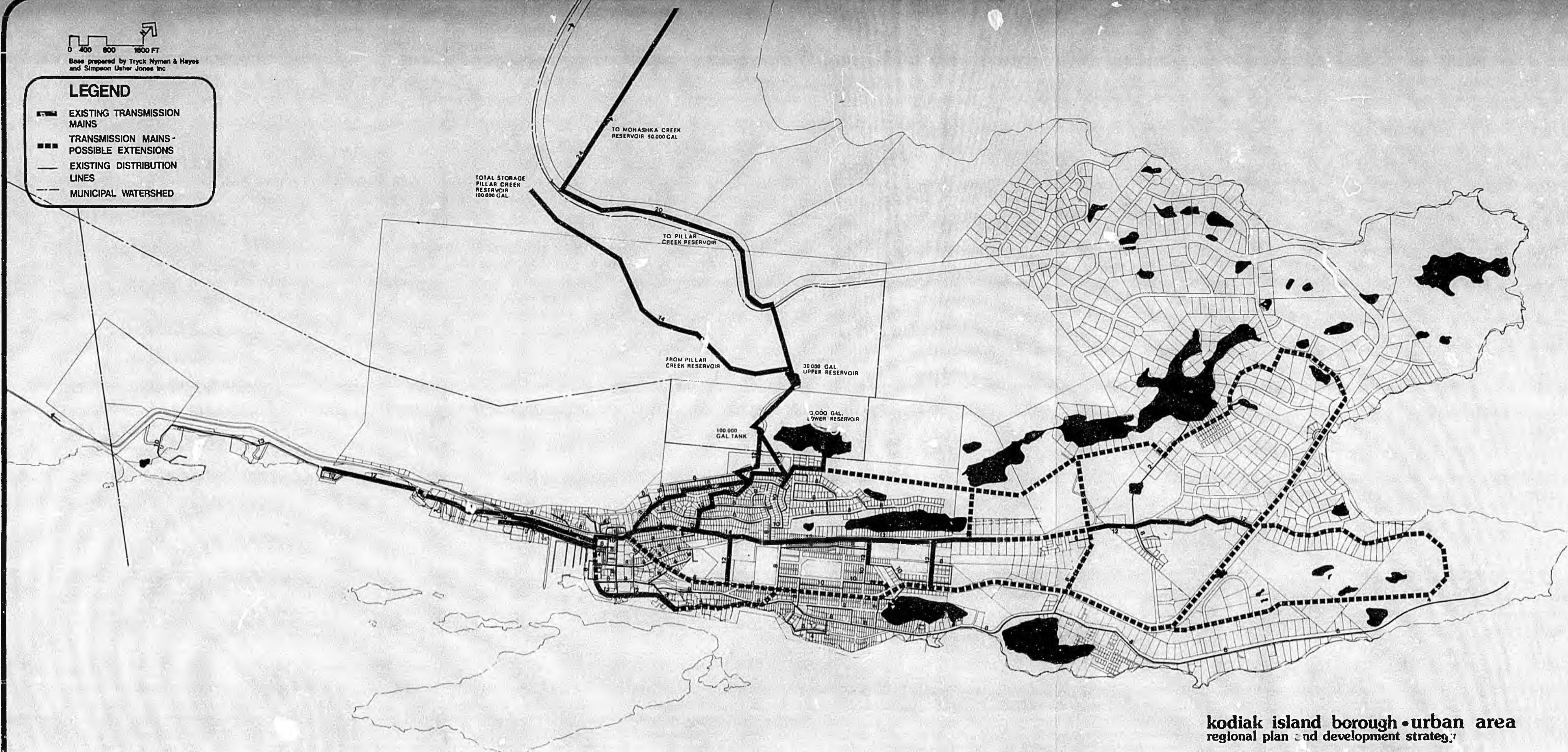
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LEGEND

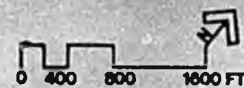
- EXISTING TRANSMISSION MAINS
- - - TRANSMISSION MAINS - POSSIBLE EXTENSIONS
- EXISTING DISTRIBUTION LINES
- - - MUNICIPAL WATERSHED



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WATER SYSTEM

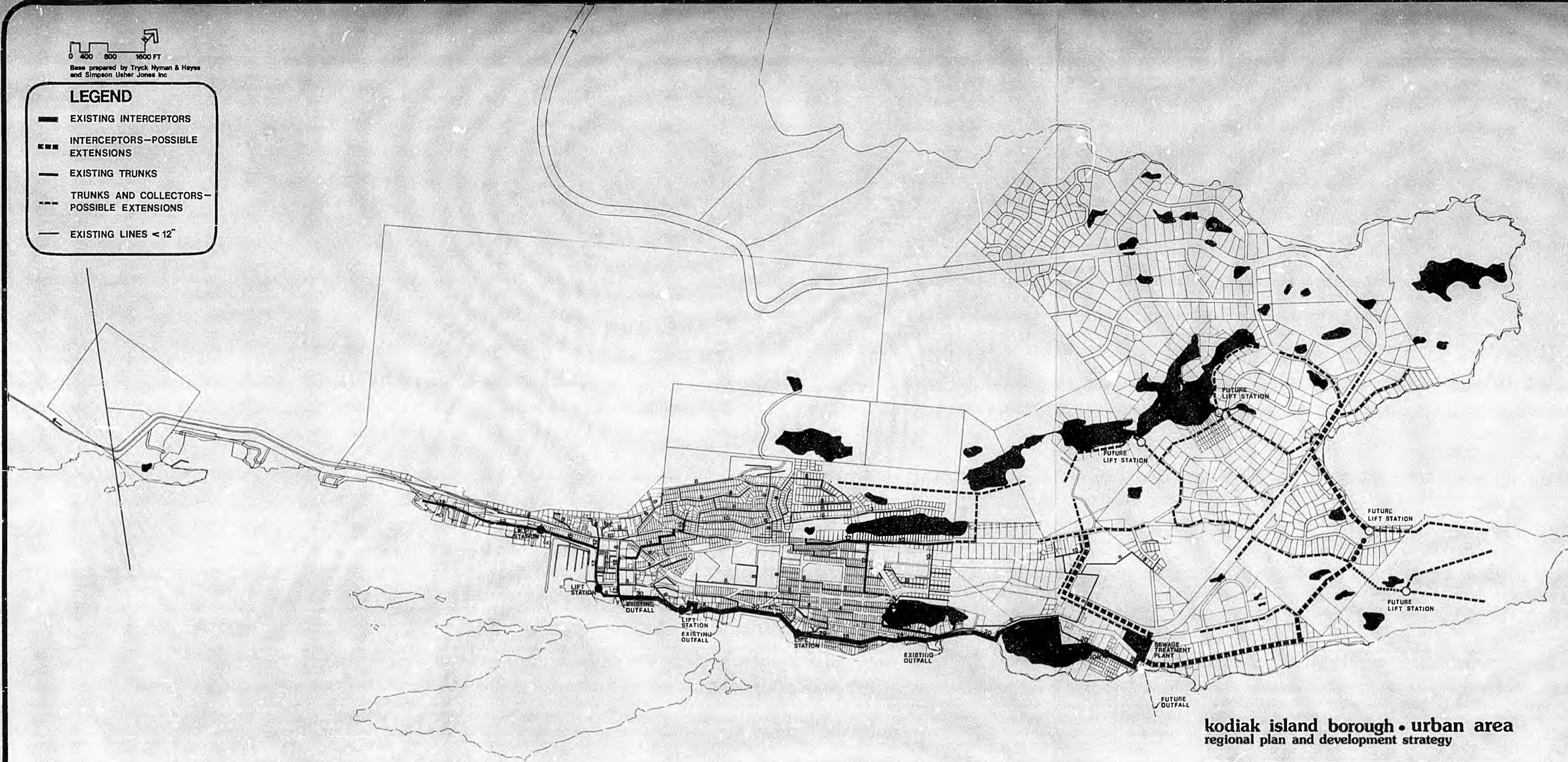
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LEGEND

- EXISTING INTERCEPTORS
- INTERCEPTORS—POSSIBLE EXTENSIONS
- EXISTING TRUNKS
- TRUNKS AND COLLECTORS—POSSIBLE EXTENSIONS
- EXISTING LINES < 12"



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WASTEWATER SYSTEM

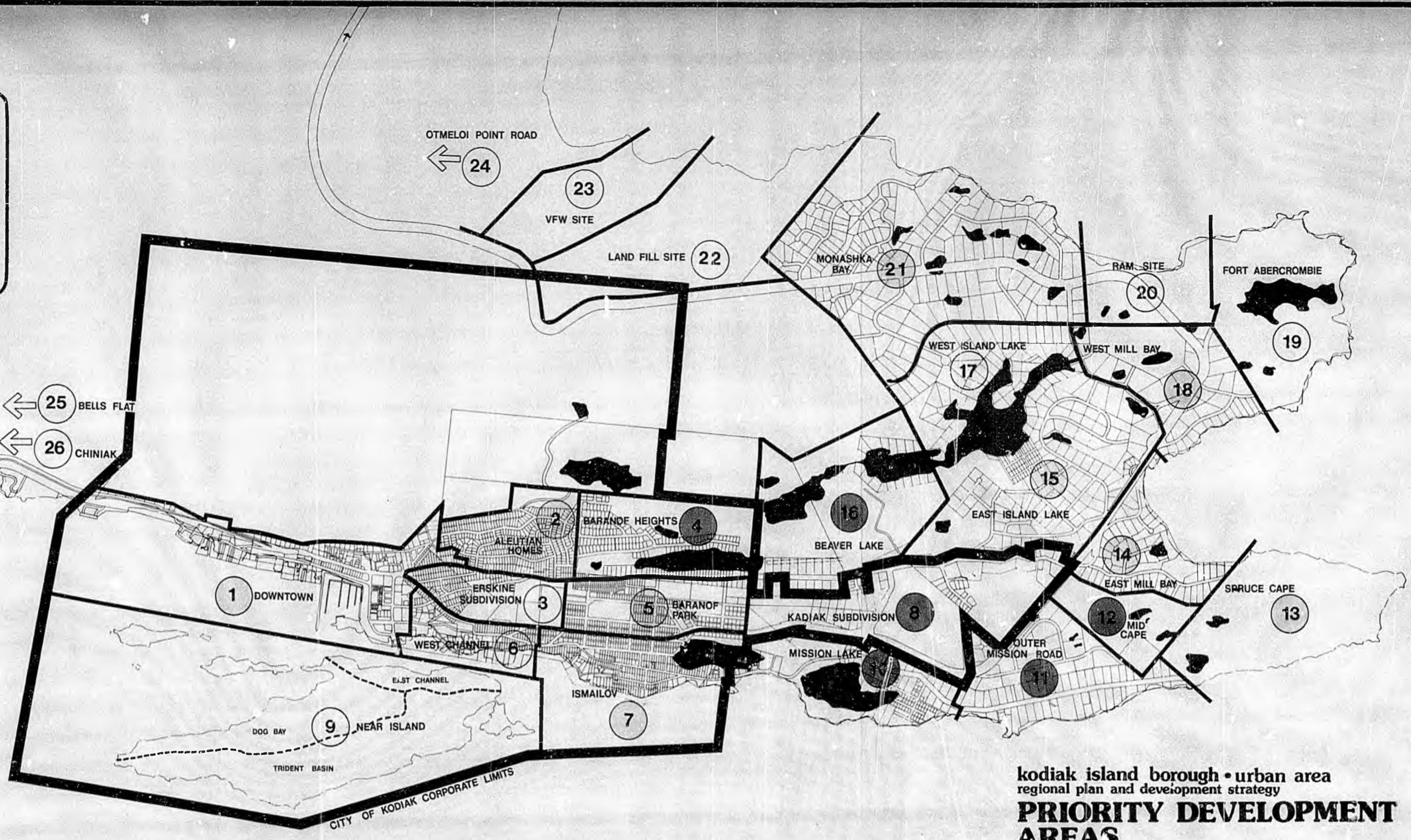
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LEGEND

DEVELOPMENT PRIORITY

- 4 HIGH
- 2 MODERATE
- LOW



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**PRIORITY DEVELOPMENT
 AREAS**

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V COMMUNITY FACILITIES

From the material developed in the previous chapters, it is now possible to identify key future community service and facility requirements and make some recommendations about meeting these requirements. Two types of requirements will be examined. The first is what is sometimes called the community infrastructure; this includes the utility systems discussed in the previous chapter, which constrain the future pattern and amount of development. The second type is the community facility: buildings and other physical improvements which are necessary for "people" services such as police, schools, etc. These facilities are generally located in response to development rather than in advance of it. Requirements for these facilities are directly related to population size and will be identified from the population projections developed in Chapter II.

Infrastructure

The water supply system was discussed in Chapter IV and illustrated on Map 10. It was pointed out that the system is already at design capacity as far as storage is concerned. To allow significant industrial expansion, storage would have to be increased. The City's Monashka Creek Dam plans would provide adequate capacity for many years. The distribution system should also be extended to provide safe drinking water; wells in Kodiak are potentially subject to contamination from septic tank wastes due to poor soils, high water table and shallow bedrock. The water distribution system should also be extended to guarantee adequate water supply for fire-fighting equipment. Areas for possible extensions were indicated on Map 10. Immediate priority should go to areas already partly developed. These would include Island Lake and the loop between Lilly Lake and the Lower Reservoir.

The wastewater collection system should also be extended to correct existing water quality problems, with first priority to Island Lake. This would more fully utilize the treatment plant, which is sized for 9500 people. If the low population projection proves correct, the plant itself should be adequate to at least 1990. If the high projected level of growth takes place, the plant may require expansion between 1985 and 1990. Extending the wastewater collection system will also make it possible to service significant amounts of undeveloped land that is highly suited to urban development. Because the cost of laterals will be borne by adjoining property owners, a beneficial side effect should be re-subdivision and sale for home construction of land held for speculation.

In both areas, the limited amount of public bonding capacity available requires that maximum benefit be extracted from each expenditure. Therefore, the pattern of future development should be controlled so that concentrations of population ultimately requiring public services do not emerge beyond the present area. This would cause expensive duplication of facilities, as well as altering the rural character of outlying areas on the road system.

To this end, retention of "conservation" zoning for outlying areas, with a minimum lot area of 5 acres is recommended. Relaxation of this minimum to 1 acre might be considered if the developer will provide approved public water supply and/or waste treatment, as environmental review determines.

The previous chapter also commented on streamways as storm drainage channels. These should be retained in natural condition. A drainage management study should also be undertaken in the next several years to determine what measures are necessary to prevent upland land uses from adversely affecting surface water courses and water bodies in the urban area.

The solid waste problem was also addressed in the previous chapter. The Borough was suggested as the appropriate body to deal with this regional issue in the immediate future.

Finally, the Terror Lake Hydroelectric Project appears desirable from the standpoint of an assured supply of lower-cost power adequate to serve both the urban area and the Support Center. It would save non-renewable fossil fuel and would apparently have few adverse impacts. KEA is actively pursuing the project but whatever assistance can be given should be given.

Projected Community Facility Requirements

The major community service requirements and facilities, other than utilities, associated with additional population are projected here. These include police services, fire protection, education, health services, recreation, and library services. Unlike the utilities discussed earlier, these do not direct the pattern of population growth. They respond to it.

A similar format is used for each facility requirement. First, requirements due to population growth based upon the existing economy are presented as a range, corresponding to the low and high projections of future population in Chapter II. Second, additional requirements likely to result from OCS activity are set out. In planning future facilities, the "low" population forecast will define minimum requirements. Actual growth in the economy, labor force, and population should be watched carefully to see if the higher set of requirements must be provided for. The 1980 census will be a good checkpoint for the population estimates. Additional requirements due to OCS-related population growth must be added in as soon as it is apparent which of the four cases is actually taking place.

Law enforcement in the City of Kodiak is the responsibility of the City Police Department. Outside the City limits, the Alaska State Troopers provide this service. The Borough itself does not provide law enforcement services. Should the City limits change as a result of annexation, the responsibility for law enforcement would shift from the State to the City of Kodiak. Unification would probably also entail additional law enforcement responsibilities for local government.

At the present time, the City of Kodiak's police station and jail (they are in the same building) are operating at full capacity, and the jail will probably have to be expanded within the next year or two. An indication of the degree of expansion is the number of additional officers required for the future (Table 7).

TABLE 7

Projected Police Staff Requirements,
City of Kodiak, Without OCS Activity

<u>Year</u>	<u>Staff Levels</u>	<u>Staff Required</u>
1976	22	
1980	29-30	7-8
1985	35-40	13-18
1990	40-50	18-28
1995	50-65	28-43

The impact of OCS activity on the police force will be strongly influenced by the location of oil company facilities. However, even if these facilities were located in or near the urban area, the impact on the Police Department would be relatively small, assuming that current police protection staff and jail facilities are expanded to maintain per capita protection in the face of normal population growth. The number of additional officers required on the police force as a result of the OCS-induced population growth is given in Table 8.

TABLE 8

Projected OCS-Related Police Staff Requirements

<u>Year</u>	<u>Case 1</u>	<u>Case 2a</u>	<u>Case 2b</u>	<u>Case 3</u>
1980	0	0	0	0
1985	0	1	0	5
1990	0	2	1	3
1995	0	0	0	0
Peak Impact Year ⁽¹⁾	0	5	1	8

(1) See Table 6 for peak impact years.

Fire protection within the Kodiak urban area is also a service provided by the City of Kodiak. Further extension of fire protection services outside the City limits is an issue that requires examination. Services could be extended under contract with the City, or independent fire districts could be formed. The following analysis assumes that the great bulk of future population increases will occur in the present urban area and will be served by the City Fire Department.

At present, the Fire Department is placing high priority on the reduction of the use of volunteer workers. With the use of paid staff, the department would be able to respond to emergency calls in the Island Lake and Spruce Cape areas within approximately four minutes - the maximum period of time allowable without serious loss of life or property. Table 9 shows the staff levels and additional staffing requirements for the Department.

TABLE 9

Projected Fire Department Staff Requirements
City of Kodiak, Without OCS Activity

<u>Year</u>	<u>Staff Levels</u>	<u>Additional Staff Required</u>	<u>Additional Staff Required By Future Growth</u>
1976	6	4	
1980	13-14	7-8	3-4
1985	15-18	9-12	5-8
1990	18-23	12-17	8-13
1995	21-29	15-23	11-19

As in the case of police protection, the impact on the fire-fighting force will be influenced by the location and type of facilities developed by the oil companies. Table 10 sets out the staffing requirements, assuming location in or near the Kodiak urban area. If this occurs, it will probably be necessary to establish a substation to reduce the travel time from the station to any potential fire in the urban area. This would cover residential and secondary industrial areas, but probably exclude oil terminal facilities (the oil companies would provide fire protection for these). At the present time, the department has the equipment to operate a substation but lacks the facility and staff. The substation should probably be located in the

Island Lake or Spruce Cape areas. If OCS development occurs in the Chiniak area, another substation would be needed. Jurisdictional responsibility in this case would have to be assigned. If the primary on-shore facilities under Case 2a and Case 3 are located off the road system in a self-contained site, no additional officers will be required for the fire protection staff over and above those for non-OCS population growth.

TABLE 10

Projected OCS-Related Fire Department Staff Requirements

<u>Year</u>	<u>Case 1</u>	<u>Case 2a</u>	<u>Case 2b</u>	<u>Case 3</u>
1980	0	0	0	0
1985	0	1	0	2
1990	0	1	0	2
1995	0	0	0	0
Peak Impact Year ⁽¹⁾	0	2	0	4

(1) See Table 6 for peak impact years.

The Borough is responsible for the provision of primary and secondary education throughout its boundaries and maintains a complete range of educational facilities. Assuming that the current ratios of students per classroom are maintained, Table 11 presents the numbers of classrooms required in the urban area through 1995.

The high school in Kodiak is new and was built with the potential for enlargement. Additional classroom space could be provided through the movement of partitions and it is estimated that the current high school could double its enrollment without excessive overcrowding. The elementary schools, however, are older and do not have the same flexibility. In addition, they are already operating at or near their capacity. In the near-term, 2 new elementary schools appear required by 1980, at 20 classrooms each. Another elementary school plus a 40-room junior high school may be required by 1985. Due to the lead time required for design and construction - approximately 2 years - planning for one elementary school should begin immediately.

TABLE 11

Projected Urban Area School Requirements
Kodiak Island Borough, Without OCS Activity

<u>Year</u>	<u>Number of Elementary & Jr. High School Classrooms</u>	<u>Number of High School Classrooms</u>	<u>Additional Elementary & Jr. High Class- rooms Required</u>	<u>Additional High School Classrooms Required</u>
1976	195	41		
1980	215-248	49-52	40-63	8-11
1985	276-335	58-71	81-140	17-30
1990	326-425	69-90	131-230	90-189
1995	383-517	81-109	188-322	147-241

OCS population impacts - if they occur in the urban area - would generate needs for additional classroom space over and above those shown in Table 11. Table 12 sets these out for elementary and junior high school classrooms;

Table 13 does the same for high school needs. Cases 1 and 2b would have minimal impacts, but Cases 2a and 3 would add significant requirements - approximately one new elementary school for 2a and two new elementary schools plus half a junior high school for 3. In addition to these longer-term requirements, there would be peak impacts of a year or two in duration for Cases 2a and 3 in which the capacity of an entire additional elementary school would be required. This would probably lead to an expedient, such as double-shifting. High school classroom requirements under all four cases could probably be met within the existing facility.

TABLE 12

Projected OCS-Related School Requirements
Elementary and Junior High School Classrooms

<u>Year</u>	<u>Case 1</u>	<u>Case 2a</u>	<u>Case 2b</u>	<u>Case 3</u>
1980	1	4	4	4
1985	0	9	2	40
1990	0	17	8	28
1995	0	0	0	0
Peak Impact Year(1)	1	45	8	69

(1) See Table 3 for peak impact years.

TABLE 13

Projected OCS-Related School Requirements,
High School Classrooms

<u>Year</u>	<u>Case 1</u>	<u>Case 2a</u>	<u>Case 2b</u>	<u>Case 3</u>
1980	0	1	1	1
1985	0	2	0	8
1990	0	4	2	6
1995	0	0	0	0
Peak Impact Year(1)	0	10	2	15

(1) See Table 3 for peak impact years.

The Kodiak Island Borough owns the major health facility in the urban area, the Borough Hospital. With this hospital and privately provided clinics, the Borough currently has ample health facilities and services to provide for the foreseeable future population. The hospital currently has 25 beds for acute care which are averaging only 40% occupancy. A new wing has been added for the provision of long-term care. Rather than facilities, the major potential problem regarding delivery of health services at the hospital is staffing, - particularly professional nursing and laboratory technicians.

At present, the greatest demand for hospital services is OB/GYN care. The second highest demand for services (measured by admissions) is the detoxification treatment of alcoholics. The two major future health needs to be anticipated in Kodiak are (1) alcoholism and alcohol-related care and needs, and (2) family practice physicians, should population growth continue.

The Borough currently has ample health facilities and services to provide for OCS-related population and services to provide for OCS-related population growth. In addition, the oil companies would probably provide temporary medical care at construction camps. Further minimizing the need for additional Borough facilities.

Current staffed recreation programs in the urban area are extensive. These are organized and run by the City of Kodiak and involve use of both City and Borough facilities. Despite (and because of) these extensive recreation programs, recreation facilities are at or over capacity and will require expansion. Current facilities cannot be used to service any further growth of population without a noticeable deterioration of quality. Since existing facilities are inadequate to accommodate the future non-OCS growth of population, OCS-related growth will lead to a further deterioration in the quality of recreation services if recreation facilities are not expanded. The Borough is currently preparing a comprehensive parks and recreation plan to address these issues.

The Kodiak City Library is supported both by the City and the Borough. The building was constructed in 1968 and was expanded in 1977. The library's primary need is additional staff positions. With its new wing, the building should be adequate to provide services to the community for the next decade. After that, it will probably be necessary to expand the library through the provision of additional facilities and the increased acquisition of books and cassettes. This expansion of library services and facilities should also be adequate to provide for additional needs due to OCS-related population growth.

Recommendations

Utilities ("infrastructure")

- Extend public sewers to the Island Lake area to correct existing water pollution problems. Design these sewers to serve medium density infill development, as well as future development in the Spruce Cape area.
- Extend the City water system to serve the Island Lake area on the same basis, for fire-fighting as well as drinking water supply.
- Derive maximum benefit from utility expenditures; i.e., concentrate on servicing developable areas adjacent to existing and future serviced areas.
- Increase the storage capacity of the City water system by raising the Monashka Creek Dam.

- For storm drainage, retain the existing stream drainage system in as near-natural condition as possible for flood-water storage, water quality and open space. Conduct a drainage management study of the unincorporated portion of the urban area to determine the degree of upland management necessary.
- Minimize the likelihood of future water quality problems in unplatted rural areas by maintaining the minimum lot area for homes serviced by septic tanks in presently unplatted areas to 5 acres with well water and to 1 acre with public water supply.
- Update and extend the City/Coast Guard solid waste study to identify capacities and operating costs of alternative solid waste disposal sites suitable for disposal of sewage sludge.
- Encourage development of the Terror Lake hydroelectric project.

Facilities

- Construct new schools to keep pace with population growth. In the near-term (by 1980), build two new elementary schools; in the mid-term (by 1985), plan to build one elementary and one junior high school.
- Reserve school sites in developing areas for future population growth.
- Construct a fire station to serve the partially developed Island Lake area, with capability for future expansion.
- Construct additional police and jail facilities to keep pace with population growth to 1985.

VI. TRANSPORTATION

Transportation provides the access that allows lands and resources to be utilized for human purposes. Historically Alaskan development has been hindered by difficult and/or expensive access, despite the presence of many resources of high intrinsic value. Adequate transportation is critical to Kodiak's future development. Indeed, several existing transportation facilities help to anchor the urban area economically: the City dock, the state airport, the state ferry service, the Inner Harbor, crowded as it is. Transportation or development: it is arguable which is the cause and which the effect, but it is clear that the two must keep pace.

Urban Area Transportation

Streets and highways are the primary elements in the urban area transportation system, which is predominantly oriented for travel by automobile. Adequate facilities for pedestrian and bicycle travel are virtually nonexistent throughout most of the area. As the urban area develops, facilities for all three types of travel will need to be provided and upgraded. It will be important to relate land-use planning closely to existing or planned transportation facilities. In general, the principle to follow is the higher the intensity of use, the greater the transportation need. Just as paths and roads only make sense if they connect destinations, major destinations such as shopping areas, apartment complexes and schools should be located on major paths and roads. This will protect public safety (by providing access for firefighting, police, emergency vehicles) as well as improve traffic flow. In doing this, direct access may have to be controlled, or congested "strip development" may result. But the principle is still important: major uses on major roads.

Outside the City of Kodiak, 32-foot-wide gravel roadways are the standard for state highways. Within the City of Kodiak, most of the major streets are paved, and many have curbs, gutters and sidewalks along one or both sides. Map 14 illustrates the extent of paved roads in the Kodiak urban area. Roads which are maintained by either the Alaska Department of Transportation (DOT) or the City Public Works Department are generally in good condition; the paved roads indicated in Map 14 are particularly well maintained. Since the Borough currently has no road maintenance capability, roads outside the City which are not on the State system are not maintained on a regular basis; therefore, many of the local gravel access roads in the subdivisions just outside the City are in very poor condition.

State Route F-11 (Benson and Rezanof Drive) through Kodiak is the City's principal arterial street and is the only approach to the Kodiak urban area from the south. To the north, Mill Bay and Mission Roads supplement Rezanof Drive as secondary arterials connecting the residential areas of Kodiak with the Central Business District (CBD) and harbor. The recent completion of the Rezanof Drive extension will shift a significant portion of the through trips on Mill Bay Road to Rezanof Drive.

Map 15 illustrates the current daily traffic volumes on principal streets in the urban area. The heaviest concentration of vehicles occurs on the downtown streets which serve the principal commercial activity of Kodiak, the seafood processing plants and the adjacent small boat harbor. On Benson Avenue (SR F-11) between Marine Way and Center Street, the area's highest daily traffic volume of 8,950 vehicles per day was recorded. The intersection of Benson, Center, Mill Bay and Rezanof carries a total of 11,600 entering vehicles daily and is Kodiak's most heavily congested intersection. Map 15 also displays general traffic flows to and from the Kodiak CBD. The location of most work and shipping activities in the downtown focuses traffic on the limited number of through streets serving the downtown area. If the pattern of concentrating employment and retail growth in the downtown continues and is coupled with low density residential development to the north, the result will be increasing pressure for widening and upgrading Mill Bay, Rezanof and Mission Roads.

The City of Kodiak has undertaken a program of paving streets in densely settled residential areas. Recent reconstruction of Birch Street in the Aleutian Homes Subdivision and the paving of 6th, 10th and 12th Streets are examples of this program. The Aleutian Homes paving project was jointly financed by a HUD block grant allocation, City sales tax proceeds and abutting property owners. Another recent project is the extension of Rezanof Drive to Mill Bay Road by the Alaska DOT. Road construction costs on Kodiak Island are quite high compared to typical costs in the "Lower 48." The City's Aleutian Homes paving project, which consisted of excavating the existing gravel road and constructing a 33-foot-wide asphalt street with curbs, gutters, and sidewalks, cost \$956,000--an equivalent of \$1.03 million per mile. The State's extension of Rezanof Drive as a 32-foot-wide gravel road (with 40-foot sub-base) cost \$1.7 million for 1.9 miles of road, or \$0.88 million per mile.

Traffic control devices include all signs, signals and pavement markings placed on streets and highways by public authorities and which regulate, warn or otherwise guide traffic. Field review of Kodiak's traffic control

devices revealed a lack of pavement markings on paved City streets. The absence of lane lines contributes greatly to driver confusion at complex intersections, such as the one at Rezanof and Center, leading to congestion, delays and potential traffic conflicts among turning vehicles. There are no traffic signals presently operating in Kodiak, and signs are in general conformance with the provisions of the US Department of Transportation Manual on Uniform Traffic Control Devices. Several black-on-yellow "Yield Right of Way" signs of the pre-1971 design were observed, however. These should be replaced with the standard red-on-white "Yield" sign established by the MUTCD.

The TRANSPO Group conducted an inventory of parking facilities in downtown Kodiak. There are approximately 850 total vehicle spaces in the downtown area. The majority (75%) are located in City-owned parking lots serving the adjacent retail businesses. During the fishing season, severe parking shortages were reported in the downtown area, attributed to crewmen leaving vehicles in downtown parking lots while they are at sea. The lot adjacent to the boat harbor can accommodate only a small portion of this long-term parking demand. Weekday occupancy rates of 40-60 percent during the off-season were observed indicating a potential deficiency during peak parking demand periods.

Public transportation in the urban area now consists solely of privately owned and operated taxis. The existing taxi service, a form of paratransit, appears adequate to meet the current level of demand for public transportation services and, with modifications may be able to accommodate the demands for such services.

Facilities for pedestrians in the urban area are limited to sidewalks in the downtown and part of the Aleutian Homes area. There are also sidewalks along the paved portion of Rezanof Drive. Concern has been expressed over the lack of sidewalks and established trails, citing safety, dust, noise and general discomfort. No facilities have been provided or designated for bicycles either, and the same concerns have been expressed.

A principal source of problems in the present urban area road system is the design and construction of local roads by developers. Streets built by private developers as part of a subdivision are subject to public review at two points. The first point is during the subdivision permit application process. The Borough's Subdivision Regulations, in conjunction with an Official Streets and Highways Plan, should set overall design criteria for roads and streets within new developments. The second point is when such streets are dedicated to a public agency for operation and maintenance. The City of Kodiak is the appropriate agency within its corporate limits. As of this date, the Borough has not been accepting dedications because it has had no maintenance capabilities. Dedicated streets should be constructed to standard agency specifications to ensure that the public is not saddled with excessive repair and maintenance costs. In the past, the City of Kodiak has found that gravel roadways with inadequate subbase and substandard construction have proven to be difficult to maintain for normal use by residents. For this reason, the City is now in the process of developing standard specifications for dedicated improvements.

Forecasts of future traffic demand for the Kodiak urban area were prepared using the small-area population projections presented in Map 13. Growth factors for observed traffic patterns in established residential areas were developed from predicted population growth in these areas. Traffic forecasts for the developing residential neighborhoods outside the City were obtained by applying current trip generation rates (daily vehicle trips per person) to the future population estimates for these areas. The projections for 1985 are included on Map 15. Two alternative projections are shown on Map 16.

The results showed that the capacity of the existing CBD parking areas would be insufficient to accommodate the increased demand. Analysis of land use and developable land area revealed a similar lack of space in the downtown area for commercial and retail land use growth to serve the forecasted 1995 population of the Kodiak urban area. A sketch land use plan was developed to meet the future needs of the Kodiak urban area in accordance with the development goals and objectives of the Borough. A reassignment of future travel demands in accordance with this land use plan was then accomplished. Both projections are presented for comparison.

1985 forecasts assume modest expansion of retail and commercial floor area in the CBD, some new convenience shopping stores (food, drugs and housewares) in northeast Kodiak and concentration of new employment in existing locations near downtown. By 1995, it is anticipated that a new major retail shopping center will have opened in northeast Kodiak to serve the rapidly growing residential districts in that area.

A comparison of future traffic flows across selected screenlines bisecting the principal highway facilities in Kodiak is presented on Map 17. The map demonstrates that travel demand to CBD employment, commercial and retail activities could nearly double over the next twenty years, even with the proposed commercial and retail development in northeast Kodiak.

Using existing traffic conditions and projected land development patterns as a guide, a recommended Official Streets and Highways Plan was developed for the Kodiak urban area. As shown in Map 17, this plan delineates a system of major and minor arterials and collector streets to serve the growing traffic needs of the City of Kodiak and adjacent residential areas in the Borough. Existing streets are classified as to traffic function, and approximate locations for future collector streets in developing areas are suggested. The adoption of this plan by the Borough, with the concurrence of the City of Kodiak, as part of the comprehensive Borough Regional Plan and Development Strategy is strongly recommended. It will provide a comprehensive framework for future street planning in connection with zoning and land development review functions.

The recommended plan designates Rezanof Drive as the major arterial street, connecting the Kodiak CBD with residential developments and activity centers such as the Coast Guard Station lying outside City limits. Within the City, Rezanof is supplemented by Mill Bay Road and Mission Road as parallel minor arterial streets. East-west connectors at appropriate points are also indicated. The primary function of the arterial street system is to provide a high level of mobility for through trips and, where appropriate, limited access to commercial and residential land uses. Collector and local streets complete the recommended plan by providing access to the City's residential areas from the arterial street system.

Table 14 presents a summary of important characteristics of each type of street classification shown in the Official Streets and Highways Plan. While paved residential streets are a desirable goal in any community, the high cost of paving construction and low traffic volumes in Kodiak indicate that paving of local streets, and even some collectors, should be a low priority for the Borough and City. Properly constructed and maintained gravel roads appear adequate to serve the access needs of many of the area's residents. For new roads, however, strong consideration should be given toward paved streets in commercial areas, and even in residential districts within the urban area. The Borough should also adopt design standards based upon an Official Streets and Highways Plan before the next construction season. Concurrently, the Borough and the City should adopt detailed standard specifications for roadway construction. In developing areas, the question of paved versus gravel surface roads should be resolved by a policy decision either to provide paved streets throughout all residential areas or only to pave the major streets identified in the Official Streets and Highways Plan.

Although the need for maintenance of local roads outside the City is evident, the economics of scale indicate that the Borough should not attempt to develop yet a third road maintenance agency in Kodiak. It is therefore recommended that the City and the Borough jointly establish and fund a unified department for maintenance of all local roadways in the Kodiak urban area, with possible extensions to other portions of the Borough as economics dictate--the Bells Flat area, for example.

At least two general approaches to the establishment of a unified roadway maintenance department are possible. In the first concept, termed the "Urban Service District," the City of Kodiak would contract to extend service to areas beyond the City limits. Fire protection services are now provided to the Island Lake area on this basis. The "Metro" concept is a second approach in which the City and the Borough would set up a third, independent agency charged with specific, limited function--in this case, road maintenance. Whatever the jurisdictional approach, the existing City of Kodiak Public Works Department (KPWD) could logically furnish the core for a unified roadway maintenance department. When this unified department has been set up, the City and Borough should begin a five-year road improvement program to bring designated arterials and collectors up to the design standards proposed in Table 14.

Analysis of existing traffic conditions in Kodiak has led to the identification of several deficiencies in the transportation system which can be alleviated by immediate low-cost street improvements. The following projects are recommended for implementation by September 1979:

- Install pavement markings and traffic signs at appropriate locations throughout the Kodiak urban area. This program would be eligible for federal funding (up to 100%) through the Alaska Highway Safety Planning Agency in Juneau.

- Signalize and channelize the intersection of Benson, Center, Mill Bay, and Rezanof. Based upon hourly approach volumes, the intersection exceeds the Minimum Vehicular Volume Warrant (Warrant I) of the Manual on Uniform Traffic Control Devices for cities

TABLE 14 PRINCIPAL DESIGN CHARACTERISTICS FOR STREETS
AND HIGHWAYS IN THE KODIAK URBAN AREA

STREET CLASS	TRAFFIC FUNCTION	ACCESS TO ABUTTING PROPERTY	TYPICAL STREET WIDTH, (feet) ⁴	ROW WIDTH (feet)	GENERAL ROADWAY TYPE	ADT RANGE
Major Arterial	Mobility for longer trips, serve through traffic	Highly Restricted	48 - 60	80	Paved, curb, gutter, and sidewalks	5,000+
Minor Arterial	Mobility for short trips, serve commercial land uses	Some Restrictions	44 - 48	70	Paved, curb, gutter, and sidewalks ¹	3,000 to 5,000
Collector	Connect arterials and local streets, serve both residential and commercial uses	No Restriction	36 - 48	20	Paved, gravel shoulder ²	1,000 to 3,000
Local	Land access, serve residential land uses	No Restriction	30 - 36	60	Gravel, Sealcoated ³	less than 1,000

- 1 Gravel shoulders outside developed areas
- 2 Curb, gutter and sidewalk optional
- 3 Paving optional; sealcoated gravel road may be sufficient
- 4 In developed areas; street width includes parking lanes

59

of 10,000 persons or less. Physical modifications should also be made to the intersection approaches to improve traffic flows.

Pave Upper Mill Bay Road between Mill Bay and Rezanof and improve the intersection of Mill Bay Road and Upper Mill Bay Road. This street should be paved to provide better access to government offices for area residents and to provide a secondary entrance to downtown Kodiak from the Aleutian Homes residential area. The intersection of Mill Bay and Upper Mill Bay should be improved to provide left turn lanes and generally channelize traffic movements with paints stripes and buttons.

Monitor traffic volumes and install traffic signals at the following intersections when warranted:

Upper Mill Bay Road and Rezanof Drive
Upper Mill Bay Road and Mill Bay Road
Mill Bay Road, and Birch Street and 6th Street
Benson Street and Marine Way

The following recommendations are directed toward accommodation of long-term growth in the Kodiak urban area and may take considerable time to evolve into a series of specific implementation projects. Work on developing these programs and projects should begin as soon as possible, however, in order to ensure their timely implementation when the need arises:

Adopt a comprehensive parking program for downtown Kodiak which addresses the needs of both the retail stores and the fishing fleet. It is recommended that the City of Kodiak control long-term parking in downtown Kodiak through adoption of a parking ordinance and police enforcement. Concurrently, the City should establish a peripheral lot for long-term parking adjacent to downtown with a low cost or free taxi shuttle service between the harbor and the parking lot.

Develop a mass transit service which initially serves Kodiak Airport, downtown Kodiak, and the community college. Taxis or vans could operate on a regularly scheduled route from the Kodiak Airport (State Airport) through the downtown area and along Upper Mill Bay and Mill Bay Roads to the Community College. A license would be granted specifically for this route, and the operator would charge passengers a flat fare to or from downtown Kodiak. During the summer, the route could be extended to Fort Abercrombie.

Improve pedestrian facilities along Mill Bay Road. The Mill Bay Road/Upper Mill Bay Road corridor is a logical location for pedestrian travel emphasis. Redevelopment of the roadway is necessary and sidewalks should be included when the roadway is upgraded. Bicycle facilities could also be provided in this corridor.

Facilities for recreational walking and cycling should also be considered in the Borough's recreation planning. The location and design of these facilities will respond more to local preferences and specific siting opportunities than to functional transportation criteria.

Island-wide and External Transportation

The highway network in the Borough is limited to the Kodiak urban area and its environs. None of the villages are linked by overland routes. They are widely separated by difficult topography, making the extension of road connections extremely expensive in relation to the number of people served. More importantly, perhaps, road connections could have drastic cultural implications for the villages. Thus, air and water modes provide the principal means of both intra-Borough and external transportation for people and goods and are likely to continue to do so.

Kodiak Island Borough is generally well served by local and regional air carriers as well as on-call charter operations. Two major carriers, Wien Air Alaska and Western Airlines, provide service at the Island's major airport located on the U.S. Coast Guard Support Center south of the Kodiak urban area. Although air travel to and from Kodiak has grown rapidly in recent years (increasing approximately 20% each year since 1973), both major carriers have sufficient capacity on existing flight schedules to accommodate projected growth with an average load factor of less than 70% by 1985. On the other hand, passenger terminal facilities are barely adequate for the present.

Local air transportation to the villages of the Borough is provided by Kodiak Western Alaska Airlines. The majority of the village flights utilize amphibian or float planes which take off and land on Kodiak Harbor in the downtown area. Service frequencies vary from once or twice per week for smaller villages up to twice daily in summer for the largest villages (Old Harbor, Ouzinkie and Port Lions). Discussions with Kodiak Western Alaska Airlines management indicated a reserve capacity adequate to accommodate increased air passenger travel demand at several times the existing level.

The City of Kodiak owns a small, general aviation airstrip just outside the City limits on the northwest side of Mill Bay Road. The gravel-surfaced runway is in poor condition and has severe vertical alignment and sight distance problems. Fortunately, the present volume of use at the Kodiak Municipal Airport is low. Any significant increase in aircraft operations at this airstrip would require an extensive reconstruction program to bring the airfield up to acceptable standards.

Fresh water float planes utilize Lilly Lake, adjacent to the municipal airstrip. A significant percentage of this use is by Kodiak Western, which maintains hangar facilities at the municipal airport. Lilly Lake and the municipal airport are located in a prime area for expansion of the Kodiak urban area. There is an existing land-use conflict between aircraft operations and residential uses, which will continue to grow worse.

The state airport has far more than adequate capacity to handle all foreseeable commercial, general and Coast Guard air traffic. Therefore, all air transportation could probably be consolidated at the state airport. As a point of information, Kodiak Western has reportedly expressed interest in moving its entire operations to the state airport, proposing to operate its amphibians out of the existing crash boat harbor.

However, consolidation would mean a strain on the existing air passenger facilities at the state airport. While airside capacity is sufficient to accommodate a tripling of annual aircraft operations, landside capacity for commercial air passengers is barely adequate to meet today's needs. Failure to expand passenger facilities could result in very long ground times for aircraft between flights by 1985. Consolidation and expansion of general aviation, particularly in the face of possible OCS-related traffic, will also require additional facilities. Tie-down facilities, hangar space, warehousing, and fueling will require special attention.

It is recommended that the Borough initiate an Airport Master Plan study, enlisting the active cooperation of the City of Kodiak and the Coast Guard. This study should be a detailed examination of the alternatives for meeting the future needs of air travel to and from Kodiak including commercial airlines, Coast Guard operations, general aviation and float plane operations. Consolidation of operations at the state airport appears both possible and desirable. Terminal improvements might be financed initially by the Borough or a newly-instituted "Port of Kodiak," and the costs recovered over time from the carriers. General aviation facilities could also be self-supporting through user charges; space might also be made available to general aviation operators for construction of their own support facilities. Not only would this study provide an adequate basis for planning the future of Kodiak air transportation, it would be the necessary first step toward making the existing municipal airport available for redevelopment into productive residential, commercial and recreational land uses.

The Kodiak fishing fleet is one of the principal expressions of the Borough's economy, and the expansion of the fishing industry into the bottom fishery is one of the major sources of potential economic growth in Kodiak. It has been known for years that the present harbor is woefully inadequate, even for the needs of the existing fleet. The Army Corps of Engineers currently has in hand an approved plan to build a small boat harbor in Dog Bay. To provide access to this new harbor, the Port of Kodiak could commission, design and operate a passenger shuttle ferry to connect the harbor with downtown Kodiak. Funds to operate this service and to repay the initial cost of the ferry could come from docking fees charged to harbor users. However, aside from the economic problems of financing such a facility, the uncertainties related to the stability of Pillar Mountain pose a major threat to any development in the Inner Harbor and Dog Bay area: thus before a commitment to the building of a new boat harbor in this area can be made, a positive resolution to the Pillar Mountain issue must be achieved.

A previous planning study for Near Island proposed a development alternative in which a high-level highway bridge would provide access to the new harbor. Residential, commercial and institutional development would be added to the basic harbor development under this proposal. It is apparent that sufficient developable and easily serviced land exists in the Kodiak urban area to accommodate expansion without relying on Near Island. A rough estimate of what the bridge might currently cost is 4 million dollars (\$100 per square foot, for a bridge 30 feet wide and one-quarter mile in length). This would absorb almost all the available local bonding capacity if financed locally. Pursuit of state or federal financing might actually jeopardize harbor development since the success of these efforts would be questionable,

and the Corps has made provision of access a first condition for their construction of the Dog Bay boat harbor. For these environmental, economic and land-use reasons, it is not recommended that the provision of a vehicular bridge to Near Island be pursued at this time. However, very little space for waterfront fishing-related industry is available around the Inner Harbor; this situation is aggravated by the Pillar Mountain Landslide. Should future harbor facility location studies identify Near Island as a logical priority area for industrial expansion despite the foregoing reasoning, the need for a vehicular bridge should be reconsidered.

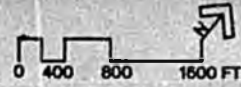
Congestion has been reported at the City Dock, operated by the City of Kodiak. This appears to be due more to problems with ship scheduling and shoreside freight handling and storage, rather than to lack of berthing and unloading capacity. It is recommended that the Harbormaster assist the shipping lines in scheduling their vessel deliveries so that two or more vessels do not arrive in Kodiak simultaneously. At present, the average number of freighter arrivals is significantly less than one per day, so scheduling might well increase system capacity without requiring the very expensive provision of new dock space. Of course expanding the City dock would be unwise until the Pillar Mountain geotechnical study is completed. A similar approach to shoreside container handling and storage may also reduce the need for more backup area. Presently, ferry service to Kodiak is provided by the M.V. Tustumena. Capacity is adequate for present demand, except during the peak (summer) season and the period when the vessel is completely withdrawn from service for annual repairs. With population growth, demand can be expected to increase proportionately. The addition of a new vessel to the run would make it possible to maintain year-round ferry service to Kodiak during the winter and would add peak capacity during the summer season. It is therefore recommended that the Borough and City officially request that the State of Alaska take steps toward adding a vessel to the Kodiak service. At the same time, the Borough and Port Lions may wish to press for the addition of regular service to that community.

Small boats have historically been a principal means of travel in the Kodiak Archipelago. Well constructed launching facilities on Anton Larsen Bay and Monashka Bay would help to make travel to the Kodiak urban area safer from Port Lions and Ouzinkie by making it possible to reach intermediate destinations on the road network without rounding Miller Point and Spruce Cape in bad weather. The Anton Larsen Bay ramp would be an improvement and expansion of existing facilities, while the Monashka Bay ramp would provide good facilities where informal launching and beaching have taken place. Temporary moorage facilities should also be considered, though weather and water problems may ultimately make them unfeasible.

Recommendations

- . Adopt an Official Streets and Highways Plan for the Kodiak urban area.
- . Adopt design standards and construction standards for streets and highways.

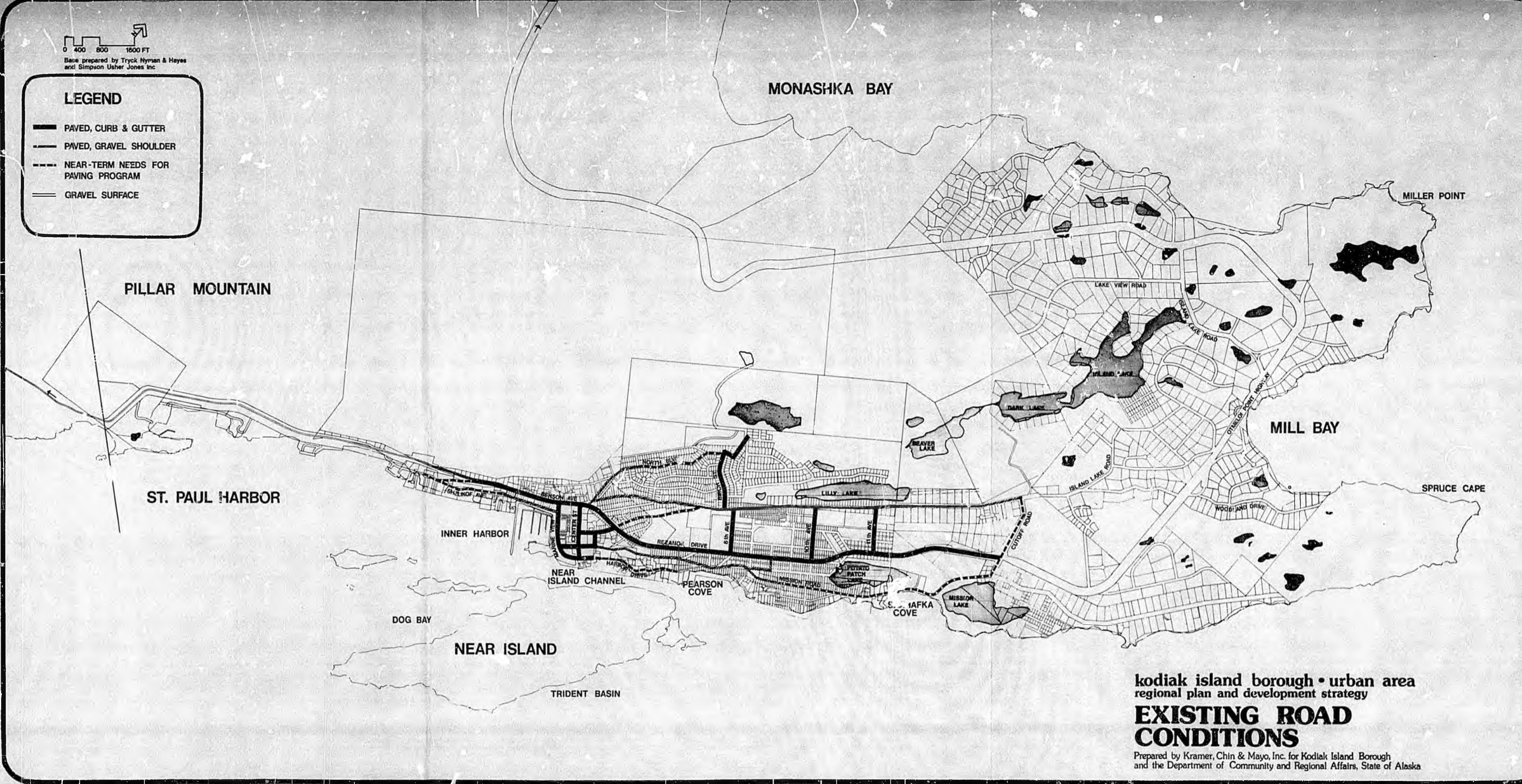
- . Establish and fund a unified road maintenance department for the urban area.
- . Redevelop Mill Bay Road to consolidate access points, provide pedestrian facilities, and allow paratransit service.
- . Implement immediate action projects to improve existing traffic conditions.
- . Adopt a comprehensive parking program for downtown Kodiak to reduce conflict between long-term fishing fleet parking and retail store parking.
- . Initiate airport master plan to improve, expand and consolidate air facilities at state airport.
- . Provided a positive resolution to the Pillar Mountain problem is achieved, continue to encourage and participate in development of Dog Bay Small Boat Harbor.
- . Assist in scheduling cargo berthings to improve cargo-handling and pursue provision of year-round ferry service.
- . Provide small-boat launching and temporary moorage facilities in Monashka Bay and Anton Larsen Bay.



Base prepared by Tryck Nyman & Hayes and Simpson Usher Jones Inc

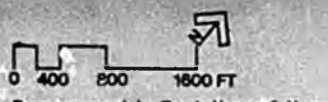
LEGEND

- PAVED, CURB & GUTTER
- PAVED, GRAVEL SHOULDER
- NEAR-TERM NEEDS FOR PAVING PROGRAM
- GRAVEL SURFACE



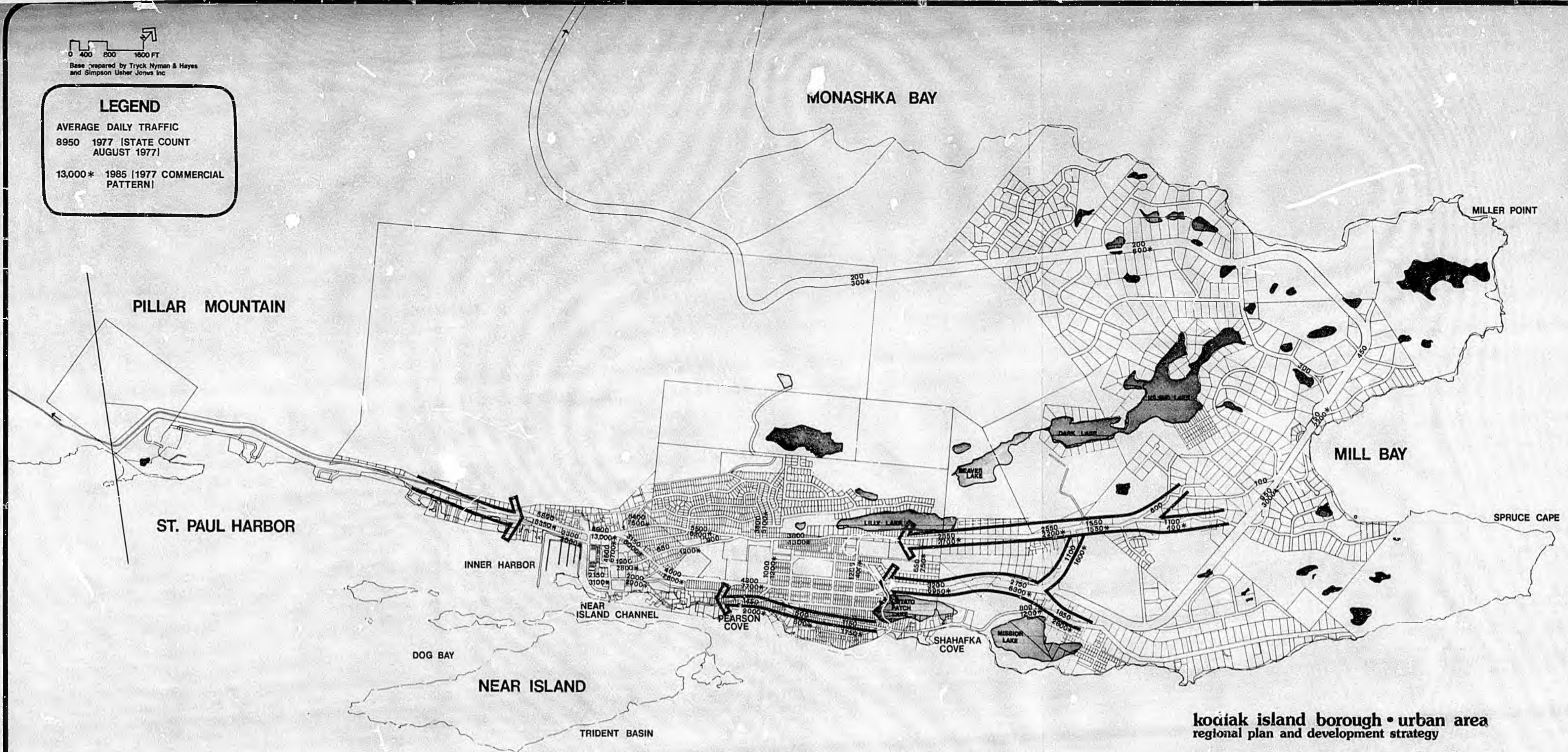
kodiak island borough • urban area
regional plan and development strategy
**EXISTING ROAD
CONDITIONS**

Prepared by Kramer, Chin & Mayo, Inc. for Kodiak Island Borough and the Department of Community and Regional Affairs, State of Alaska



Base prepared by Tryck Nyman & Hayes and Simpson Usher Jones Inc

LEGEND
 AVERAGE DAILY TRAFFIC
 8950 1977 (STATE COUNT AUGUST 1977)
 13,000* 1985 (1977 COMMERCIAL PATTERN)



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 regional plan and development strategy

1977 & 1985 TRAFFIC

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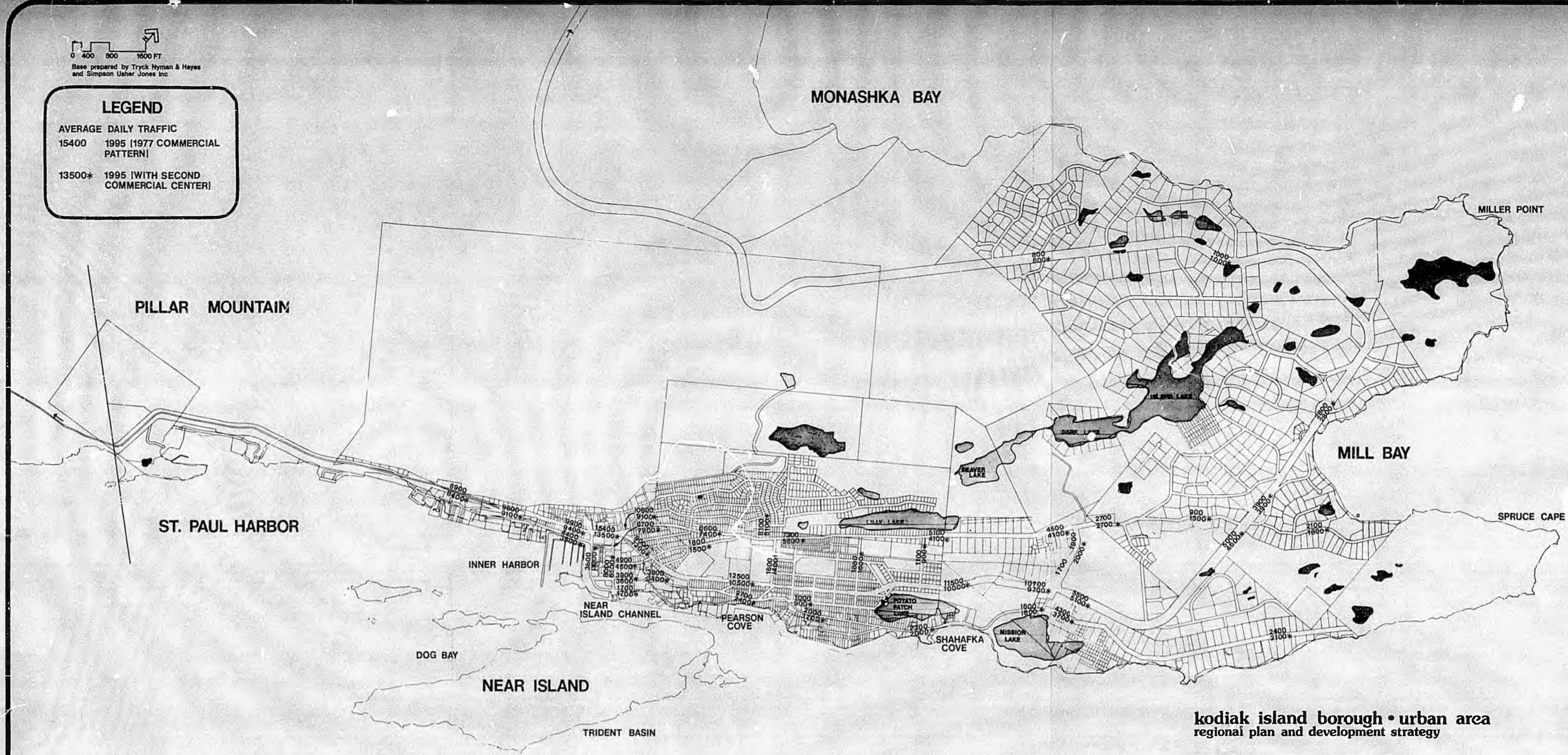


LEGEND

AVERAGE DAILY TRAFFIC

15400 1995 (1977 COMMERCIAL PATTERN)

13500* 1995 (WITH SECOND COMMERCIAL CENTER)



kodiak island borough • urban area regional plan and development strategy

1995 TRAFFIC

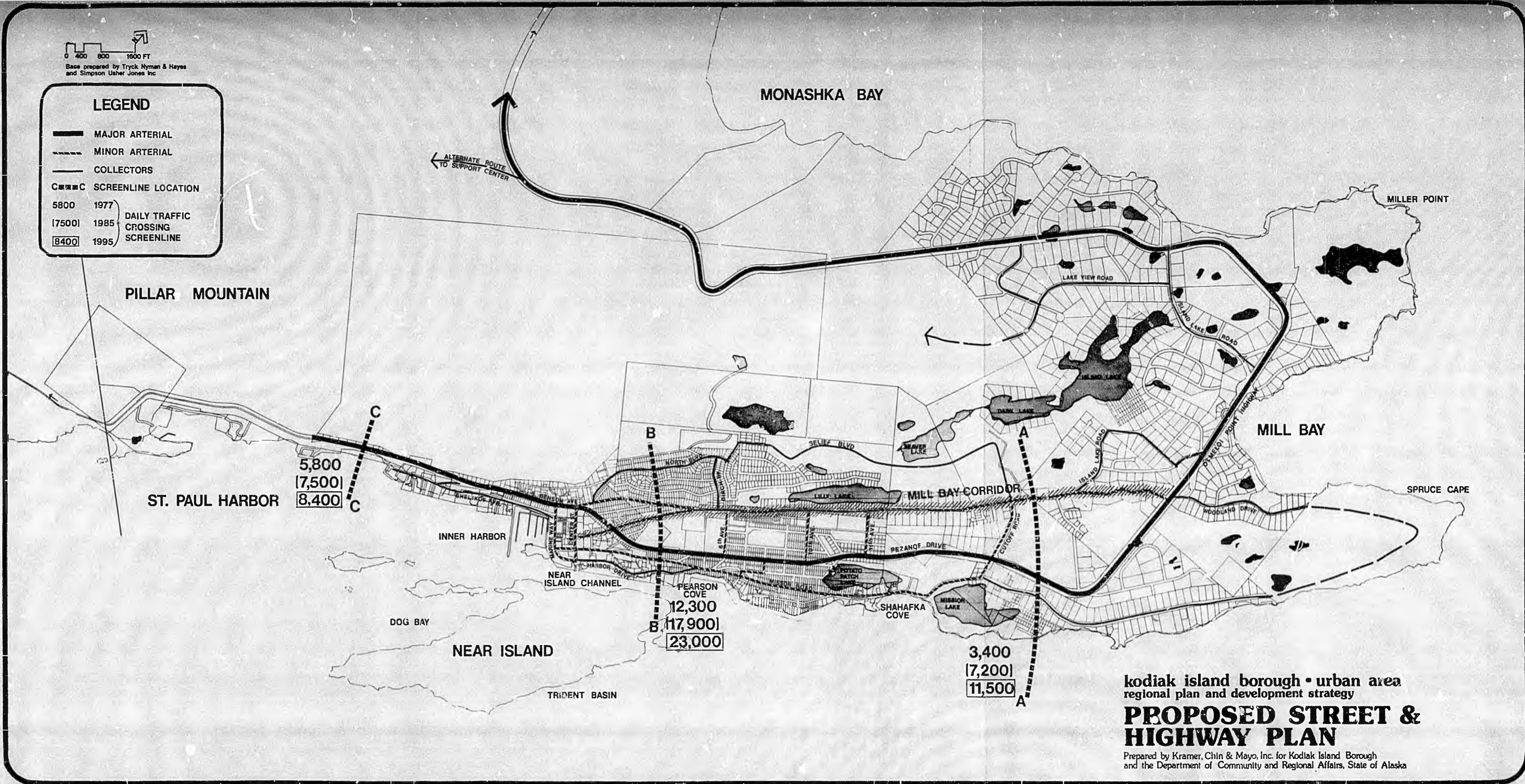
Prepared by Kramer, Chin & Mayo, Inc. for Kodiak Island Borough and the Department of Community and Regional Affairs, State of Alaska

0 400 800 1600 FT
 Base prepared by Tryck Nyman & Hayes
 and Simpson Usher Jones Inc

LEGEND

- MAJOR ARTERIAL
- - - MINOR ARTERIAL
- COLLECTORS
- ■ □ ■ C SCREENLINE LOCATION

5800	1977	DAILY TRAFFIC CROSSING SCREENLINE
[7500]	1985	
[8400]	1995	



ST. PAUL HARBOR
 5,800
 [7,500]
 [8,400]

PEARSON COVE
 12,300
 [17,900]
 [23,000]

3,400
 [7,200]
 [11,500]

**kodiak island borough • urban area
 regional plan and development strategy**
**PROPOSED STREET &
 HIGHWAY PLAN**

Prepared by Kramer, Chin & Mayo, Inc. for Kodiak Island Borough
 and the Department of Community and Regional Affairs, State of Alaska

VII. LAND USE (Without OCS Development)

Sketch Plan

Another result of the OCS Impact Study was a sketch land use plan for the urban area, reproduced on Map 18. This map was produced to display one preliminary interpretation of the Borough Community Attitude Survey, and was not checked against projected population, utility requirements, etc. It has served as a good point of departure for the development of the recommended land use plan shown on Map 19.

Comparison of these maps displays some important decisions the community and its officials will have to make. Both plans are generalized policy proposals for a target year of 1995; neither would ever be fully realized. Rather, the purpose of the adopted long-range plan would be to guide short-range decisions on zoning, variances, subdivision approvals, street extensions, school siting and the like.

The sketch plan is essentially a continuation of present development and past plans. Significant points to note are the large amount of land in low density residential use (one acre lots), retention of most commercial growth in the downtown area, extensive development of Near Island, strip commerce along Mill Bay Road and an industrial park at the municipal airport. No specific use is identified for Spruce Cape.

Recommended Land Use Plan

By contrast, the recommended plan proposes much larger areas for medium (7200 square foot lots) and high density residential development (apartments), in areas served by sanitary sewers and public water. This is to offset the impact of rising land prices on housing costs. The plan also would allow trailer parks or mobile home subdivisions in selected medium density areas, again to offset rising housing costs. Specifically, the plan proposes expansion of residential use in the Island Lake-Spruce Cape area rather than Near Island or Bells Flat, both of which have previously been suggested as expansion areas. Apartments would be concentrated along Mill Bay Road, which should be redeveloped as a high density residential corridor with major roadway and traffic improvements, as well as pedestrian and bicycle facilities. The idea is to concentrate daily destinations for walkers in one area to gain the most benefit from transportation improvements. The Monashka Bay area would remain low density and unserved.

New industrial development is suggested at Swampy Acres (off the map) and on land presently occupied by the City's Municipal Airport. The former recommendation is dependent upon identifying a suitable sanitary landfill site, and the latter recommendation is dependent upon the feasibility of relocating general aviation from the City airport to the State airport. Aesthetic impacts at both sites can be minimized by requiring landscaping and buffering. The plan proposes limited industrial development on Near Island to support the Dog Bay Boat Harbor. Again, the plan's limitations on use of Near Island are contrary to a previous proposal.

Industrial area for the fish-processing industry is extremely limited in the existing Inner Harbor area. Judging by typical industrial space requirements, approximately 20 acres every 5 years would be required to allow the fisheries-related development that would generate the low-range projected population. Again, it is for the community to decide if it wants to pursue further economic development at all. If it wishes to do so, infill development along the existing "cannery row" is possible for the next five years or so. Beyond that, suitable land is not readily identifiable due to the uncertainty over Pillar Mountain, potential environmental problems (at locations such as Trident Basin), and marine engineering and weather issues. The Pillar Mountain situation also carries the potential that relocation of the City Dock may prove necessary. If so, it conceivably could prove beneficial for the community to seek cooperative development of new cargo and dock facilities with an OCS marine service base. The timing of the geotechnical study may be uncomfortably close to the OCS lease sale. The Borough and City may therefore wish to pursue a study of alternative sites, associated costs, and the location relationships between cargo facilities, backup facilities and the seafood processing industry. Pursuing the study now would provide the necessary information upon which to make a reasoned decision at the time of the lease sale or shortly after.

Only limited growth is suggested in the existing commercial core because it is located in a seismic wave hazard area. Expansion of commercial space is proposed in two neighborhood concentrations along Mill Bay Road and a second major center near Spruce Cape, timed as population develops in the Island Lake - Spruce Cape area. The intent is to control strip commercial development along Mill Bay, with eventual physical redevelopment of the roadway itself. The major characteristic of commercial strips is uncontrolled access, leading to safety problems and congestion, as well as visual blight.

Open space recommendations are tied to natural hazard and drainageway recommendations made earlier, and retention of public lands until they are evaluated for other purposes. A number of private parcels along shorelines are indicated as "green belt"; these are undeveloped properties in the tentative tsunami hazard zone. It is not intended that they be taken for public use, but that new residential use be prevented in this area. The greenbelts in the Spruce Cape Area are intended to indicate the potential application of planned unit development and recreation land dedication provisions in the zoning and subdivision ordinances.

Map 20 summarizes urban area projects that are suggested for action in the near future. These have all been touched upon earlier, but several may require further elaboration. The traffic signals indicated were discussed in Chapter VI. The Benson/Mill Bay intersection is already justified and eligible for funding assistance. The others will require more detailed traffic counts to verify needs. The police station expansion is a high priority, but should be delayed until the results of the current state-sponsored, state-wide study of Alaska State Trooper and holding facilities is known. It may be that at least part of the requirements for jail expansion can be met in a state-financed facility. The fire substation is proposed near the northern intersection of Mill Bay and Rezanof, to better serve already developed residential areas at the northern end of the urban area.

This location is also proposed for the first new elementary school. Children from the Island Lake and Outer Mission Road areas would be within easy walking distance of a school here, and it would be well-sited to pick up population from the Mid-Cape and Spruce Cape neighborhoods as they develop. A site size of 5-10 acres is recommended to accommodate playfields, parking and retention of natural areas for buffering and informal play. Unfortunately, there is no adequate publicly owned site in the area now. Purchase may be necessary, or dedication as part of a planned unit development may be possible, depending on the size of parcel ownership in the area. A second school site for the near future is identified at the south end of the municipal airport, on Borough land. This site would be dependent on the results of the airport study; it might still be feasible even if float plant operations were retained at Lilly Lake. Again, 5-10 acres is recommended; the site would be within one-half mile walking distance from the developing Baranof Heights, Beaver Lake and Kodiak Subdivision neighborhoods. A third priority site (shown on Map 19) would be at the south end of Lilly Lake, again depending on the airport study. The population of the Aleutian Homes area is probably greater than that suggested strictly by a count of housing units, and this neighborhood already appears able to fill half of a new elementary school by itself.

Suggestions have been made that the new school sites be at Bells Flat and Monashka Bay. Referring back to Maps 12 and 13, the recommended sites are at either end of the group of neighborhoods with high priority for development. These are the areas that are generating the major increase in school population. Map 13 displays the estimated 1977 populations of Chiniak, Bells Flat and Monashka Bay. Taking the elementary school population at roughly 20% of the total, the Bells Flat/Chiniak area probably generates 70 children while a new school would hold some 400-450 children. Since the Coast Guard Support Center is not growing significantly, it appears most reasonable to continue to accommodate these children at Peterson Elementary School. Monashka Bay appears to generate some 20 school children. Eventually a site is recommended at West Mill Bay, but in the meantime it is recommended that schools be centered where the school-age population is growing most rapidly. These are also the areas already or soon to be provided with sewers, water and fire protection. Again, the underlying recommendation is to concentrate public expenditures for the most benefit.

Major Non-OCS Alternatives

The recommended long-range plan for the urban area is a proposal made to the Kodiak community. The community will decide what its future is to be. The three basic alternatives before the community, setting OCS activity aside for the moment, are:

1. Continue present de facto policies and development trends. This might be termed the "No Action" alternative. It would look something like the sketch plan, except that the development of Near Island is believed to be unlikely.
2. Take steps to correct existing shortfalls in community facilities, infrastructure and housing. Develop necessary infrastructure and provide space to allow projected industrial growth and associated

population increases. This would amount to "planned growth." It would eventually look like the recommended plan, except that the final location of industrial expansion land cannot be determined at this time.

3. Take steps to correct existing shortfalls in community facilities, infrastructure and housing, but do not accommodate additional growth in employment. This would amount to a "growth freeze." This would resemble much of the recommended plan, but less area would be in medium and high density residential housing; the second commercial center would not develop; and Mill Bay would not develop fully into a high density, pedestrian-oriented corridor.

The recommendation made here is that the community choose alternative 2 or 3. To help in making the decision, this summary of the existing situation is offered:

- . The economy of the Kodiak urban area is based upon the fishing industry and the Coast Guard.
- . Coast Guard employment is stable for the foreseeable future. The Alaskan fishing industry appears to be on the verge of significant expansion, and Kodiak could attract many of the jobs involved if it can provide the space and infrastructure necessary to the industry--including both the fishing fleet and the canneries.
- . At present, however, Kodiak's infrastructure is seriously strained, and housing for workers is in short supply. Until these constraints are removed, significant industrial growth is unlikely.
- . The shortfall in services and housing also has adverse environmental effects. In particular, these include surface water pollution, dust, periodic water and power shortages, high prices, overcrowded housing, and development in hazard areas.
- . Significant effort and expense will be required to correct these shortfalls and their effects.
- . To minimize this effort and expense, as well as to slow the rate of housing cost inflation, concentration of service expenditures is recommended.
- . Accommodating significant industrial growth and associated population growth will require additional expenditures in advance of that growth.
- . Because of the uncertain stability of Pillar Mountain, large-scale expansion in the existing "cannery row" area is not advisable, and the existing city docking facilities should not be expanded at this point. Significant population growth may be delayed until industrial growth resumes.

Recommendations

Housing

- Slow homesite cost inflation by allowing resubdivision and development on 7,200 square foot lots in areas to be provided with services (Island Lake and Spruce Cape).
- Provide opportunity to reduce home construction costs by allowing townhouses and planned unit developments.
- Provide opportunity for affordable moderate income housing by zoning areas for mobile home subdivisions and trailer parks; allow mobile homes in other single-family areas only during construction of conventional homes (two-year limit).
- Provide additional areas for multi-family rental housing in West Channel area and along redeveloped Mill Bay Corridor.
- Encourage canneries to provide dormitory housing for seasonal workers (above tsunami hazard zone). Enforce existing zoning to eliminate overcrowding and de facto dormitory use of housing in single-family districts.
- Form local housing authority to provide housing for residents unable to afford private rentals or purchases.

Industry

- Pursue development of Dog Bay Small Boat Harbor for fishing fleet and interim development of transit docks at Shannon Point.
- Provide ferry to Near Island for access to Dog Bay moorage; allow limited area for fleet-related industrial development on Near Island, with care to protect Trident Basin.
- Pending outcome of Pillar Mountain geotechnical study, do not commit to expansion of City Dock or Cargo Terminal; pursue parallel study of: a) dock and ancillary facility requirements and b) alternative sites, related costs and operational characteristics.
- Pending above studies, expansion by canneries along "cannery row" should be with realization that City dock may be relocated.
- Encourage light industry to relocate from redeveloped Mill Bay Road to industrial park in municipal airport area.
- Restrict industrial activity in Bells Flat to accord with Coast Guard restrictions for Holiday Beach Receiver Station.

- If suitable alternative solid waste sites can be identified, allow transportation-related industrial development at "Swampy Acres."

Commerce

- Maintain existing downtown commercial core, with limited expansion, pending determination of probable tsunami recurrence and height. Commitment to expand should be with realization of potential tsunami hazard.
- Designate subsidiary neighborhood commercial centers to serve immediately adjacent residential areas.
- For the long-term, reserve area for a second commercial center to serve population in Spruce Cape and Island Lake areas, near intersection of Mill Bay Road and Rezanof Drive. Reserve sufficient area to relocate downtown core pending tsunami hazard identification.

VIII. OCS-Related Industry

The preceding chapters have been intended to bring Borough long-range planning to the point that reasoned decisions can also be made about Borough policy toward location and management of OCS onshore facilities and related industries. The two principal choices the community has are:

1. Try to capitalize on OCS onshore development as a stimulus to the Kodiak economy; allow it to site in or near the urban area.
2. Keep OCS development at arm's length; minimize its effect on the urban area.

A brief summary of the on-shore effects of OCS-related development includes these points:

- . It probably cannot be kept out of the Borough.
- . There is potential for short-term economic gain and a longer-term increase in the tax base.
- . OCS-related employment could seriously aggravate existing socio-economic problems in the urban area. A sudden population boom, especially likely during the construction period for an oil terminal, would require expansion in services that the boom would be too short-lived to finance.
- . A boom would also drive prices, and therefore wages, up; this could well force the fish-processing industry to move out of Kodiak. The result could be loss of a major share of the urban area's long-term economic base.
- . Enough feasible and environmentally acceptable sites appear to be available (see Map 2) that the Borough can greatly influence the choice of site.

Therefore, a general arm's-length policy is recommended toward onshore OCS-related development. It should be kept out of the urban area and villages. If possible, one of the Native corporations should receive some of the benefits associated with provision of onshore facilities. However, the door should be left open for possible joint development of a service base near the urban area in view of the problem posed by the Pillar Mountain landslide and its proximity to the Inner Harbor.

Significant onshore OCS-related development is likely to occur only if and when an oil discovery is made. The oil companies are reported by Simpson Usher Jones, Inc. as not likely to establish a marine service base in the Kodiak Island Borough during the initial exploration period. During the development period, a base might be established, possibly beginning in 1982. This base would be a trans-shipment point for materials required by the offshore drill and production rigs and could therefore generate considerable vehicular traffic if located on the road system. It would also require a large supply of fresh water, which would strain the capacity of the City of Kodiak water system in its present configuration, if an attempt were made to link the service base to the City system. These would be the major impacts; the numbers of construction and operation personnel would probably not pose insurmountable problems for the urban area (see Case 2B, Table 6).

An oil terminal, the other likely type of onshore facility, would only be built if commercially exploitable amounts of oil were found. Construction would probably start in 1985 or 1986, and large numbers of construction workers would be required (Cases 2a and 3, Table 6). This influx of workers would definitely cause severe community dislocations unless mitigating measures were imposed.

The recommended strategy for dealing with OCS-related facilities revolves around two major points: 1) the Borough, in cooperation with other local jurisdictions and groups such as Koniag, can and should designate the feasible sites (Map 2) most appropriate for development; 2) the zoning ordinance should be amended to encourage development only on these sites and, in any case, under carefully designed conditional use procedures. In detail, the recommended approach would be as follows:

1. Specify OCS support facilities as prohibited uses in all zoning districts other than the General Industry district, where they would be permitted as a conditional use.
2. Adopt tight conditional use provisions for OCS support facilities, as proposed in the final draft version of the zoning code (Section 17.05.040).
3. Well before the lease sale, amend the zoning maps to designate these sites General Industry (I2). Use the "amendment with special limitations" procedure (Section 17.08.090) to restrict the allowed uses beyond those generally permitted in the General Industry district (Section 17.03.130 of the draft zoning code). This would prevent other industrial uses such as canneries from pre-empting these prime sites. However, enough allowed uses have to be specified to avoid "spot zoning." Suggested uses include the following:
 - a) Permitted principal uses and structures:
 - i. Boat moorages;
 - ii. Boat repair;
 - iii. Open space for informal recreation.
 - b) Permitted accessory uses and structures:
 - i. Accessory buildings;
 - ii. Watchman's dwellings and owner-operator's dwellings.
 - c) Conditional uses:
 - i. Petroleum exploration and development, marine service bases and oil terminals on tracts of not less than 5 acres.

d) Conditional accessory uses:

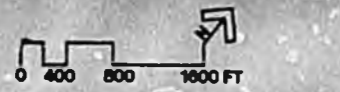
- i. Fuel storage;
- ii. Airports;
- iii. Natural resource extraction operations;
- iv. Dormitories.

As a result of this strategy, OCS support facilities would only be allowed in the Borough as conditional uses in the General Industry district. The only areas in this district would be the Borough's designated OCS sites and the Inner Harbor (OCS development here would be precluded by the terms of the conditional use section). Attempted OCS development in any other area would require Borough Assembly approval of a rezoning (not granted easily), followed by compliance with all the conditional use provisions. In other words, two sets of public hearings rather than one. Since time is likely to be critical to the oil companies, this should further encourage them to look closely at the Borough's designated sites.

If these recommendations are followed, the planning mechanisms would be in place to deal with an actual OCS development proposal. An applicant would approach the Borough planning department as provided in the conditional use chapter (17.05) of the zoning code. Permission to develop would be subject to all the specific conditions set out there for OCS facilities. The planning commission would also impose additional conditions of approval to meet particular situations or needs. Conditions would focus on the mitigation of both the environmental and socio-economic impacts of OCS facility development.

Recommendations

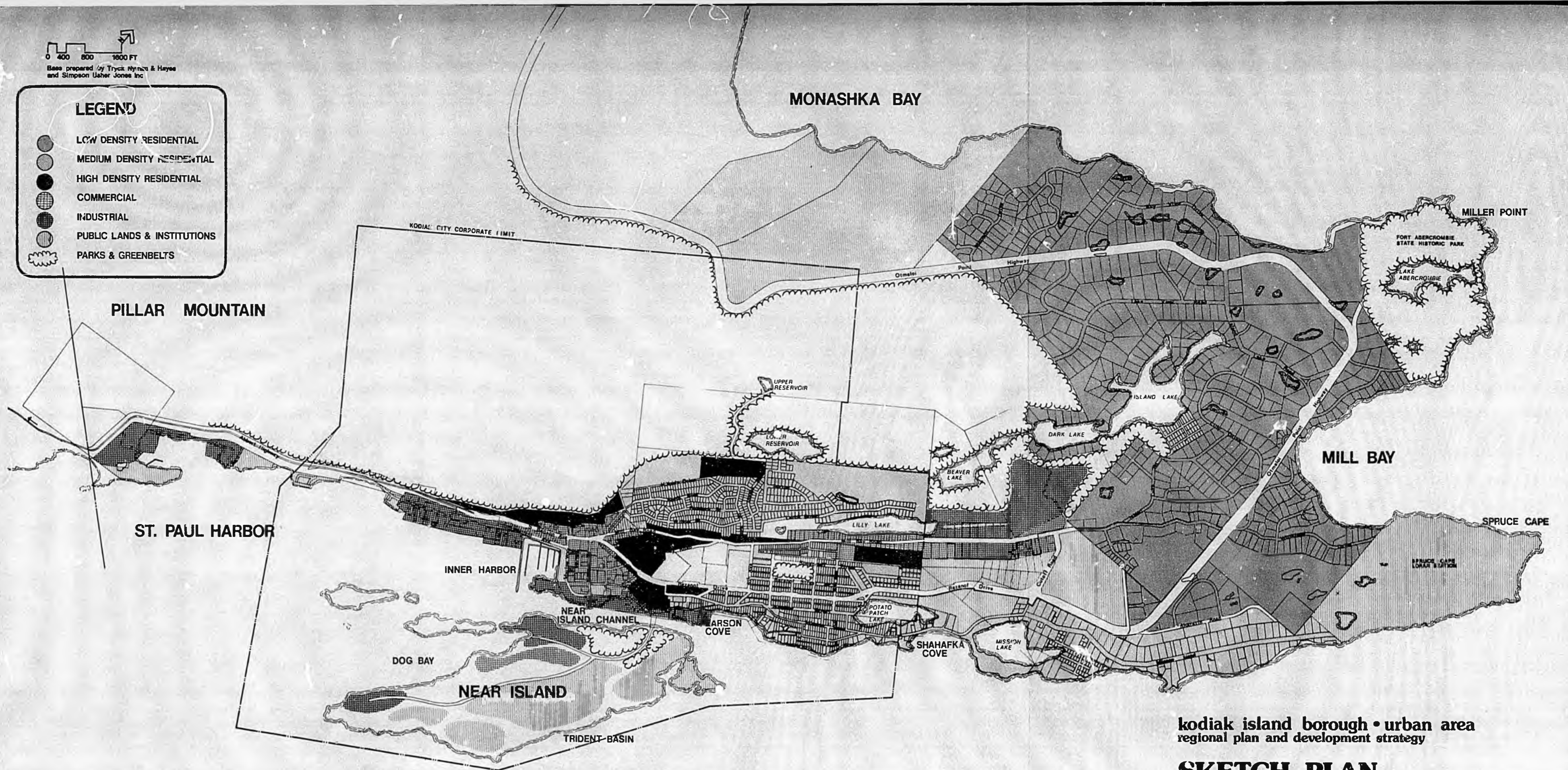
- . To avoid adverse impacts during construction period, do not allow oil terminal development immediately adjacent to urban area or villages. The only allowable sites on road network are to be at or beyond Kalsin Bay. Designate preferred sites and zone appropriately.
- . Marine service base sites should meet the same conditions, unless City Dock relocation is warranted by results of Pillar Mountain study. If so, consider joint development of service base and City Dock.
- . Retain "conservation" zoning in presently undeveloped areas. Planning permission for OCS development should be dependent upon complete environmental review and conditional use approval. Conditions to be imposed during construction.
 - Off-Island hiring halls.
 - Operators to furnish all utilities, services, housing and community facilities.
 - Limit need and opportunity for personnel visits to urban areas.
 - Limit need and opportunity for short-term secondary economic development.



Base prepared by Tryck Nymark & Hayes and Simpson Usher Jones Inc

LEGEND

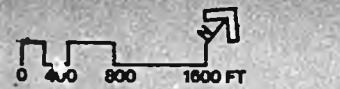
- LOW DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- PUBLIC LANDS & INSTITUTIONS
- PARKS & GREENBELTS



kodiak island borough • urban area regional plan and development strategy








SKETCH PLAN

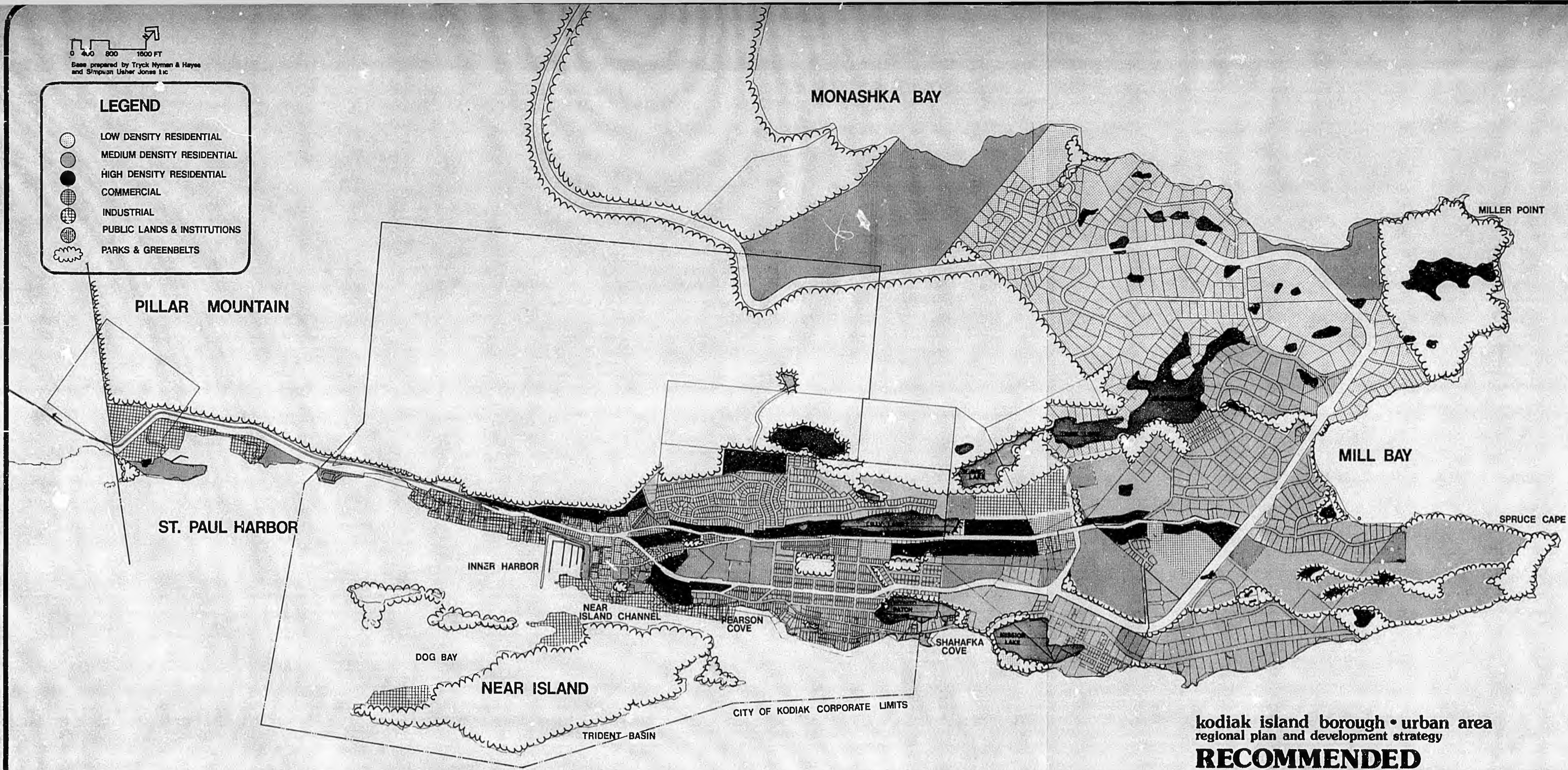
Prepared by Simpson Usher Jones Inc for Kodiak Island Borough and the Department of Community and Regional Affairs, State of Alaska



Map prepared by Tryck Nyman & Hayes
and Simpson Usher Jones Inc.

LEGEND

-  LOW DENSITY RESIDENTIAL
-  MEDIUM DENSITY RESIDENTIAL
-  HIGH DENSITY RESIDENTIAL
-  COMMERCIAL
-  INDUSTRIAL
-  PUBLIC LANDS & INSTITUTIONS
-  PARKS & GREENBELTS



kodiak island borough • urban area
regional plan and development strategy

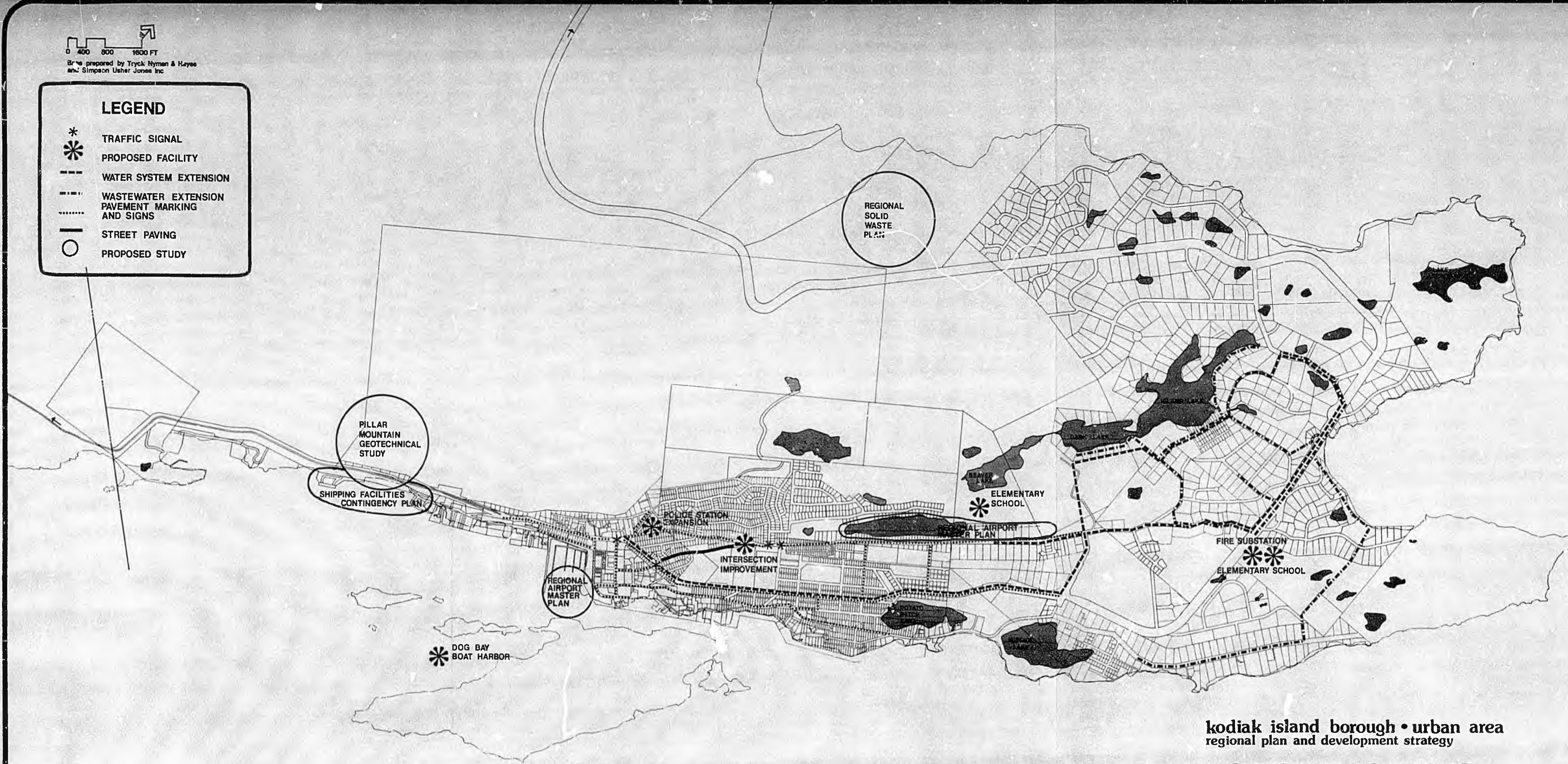
**RECOMMENDED
LAND USE PLAN**

Prepared by Kramer, Chin & Mayo, Inc. for Kodiak Island Borough
and the Department of Community and Regional Affairs, State of Alaska

0 400 800 1600 FT
 Plan prepared by Tryck Nyman & Hayes
 and Simpson Usher Jones Inc

LEGEND

- * TRAFFIC SIGNAL
- ✱ PROPOSED FACILITY
- WATER SYSTEM EXTENSION
- .-.- WASTEWATER EXTENSION
- PAVEMENT MARKING AND SIGNS
- | STREET PAVING
- PROPOSED STUDY



kodiak island borough • urban area
 regional plan and development strategy

ACTION PROJECTS

Prepared by Kramer, Chin & Mayo, Inc. for Kodiak Island Borough
 and the Department of Community and Regional Affairs, State of Alaska

IX. SHORT-TERM PLANNING TOOLS

This is the point in a planning study at which there is often a discussion of "implementing the plan." A more appropriate phrase would be "using the plan". A comprehensive plan is never fully achieved. It is a road map toward the community's future, and like road maps, it should be updated at frequent intervals. It represents long-range policy decisions about the community's future. These should be used to guide short-term planning decisions such as where to place mobile home parks, utility extensions, new school locations, and so on. Without the comprehensive overview, these short-term decisions can be seriously mistaken and successfully challenged in court.

Therefore, in one sense, this chapter will be written by the community's Planning and Zoning Commission. Draft revisions of the zoning ordinance, and subdivision regulations have been submitted and discussed. A Capital Improvement Programming (C.I.P.) process for the Borough has been proposed. An Official Streets and Highways Plan has also been put forward to guide future transportation projects and for reference when development proposals are made. The final drafts of these documents (they will not be completely final until adopted by the Borough Assembly) will be bound separately as appendices to the final version of this summary report.

X. ENVIRONMENTAL IMPACT ANALYSIS

An environmental impact analysis has been prepared for the Regional Plan and Development Strategy. The thrust of this analysis, like that of the plan, is directed toward the recommendations for the Kodiak urban area. The analysis is summarized here. It is fully reported in a separately printed working paper: "Study Element 7: Environmental Impact Analysis".

The proposed plan and development strategy consists of many recommendations which affect employment, population, land use and the physical character of the urban area. The basic employment recommendations are to encourage growth within the fishing industry and to discourage use of the local labor force for OCS-related employment. Diversifying the Borough's industry is a desirable goal, but development of seasonal industries such as tourism should not be actively pursued because growth in such industries could add on-season congestion and off-season unemployment. These are already causes of concern because of the seasonal aspects of the fishing industry.

The plan is based upon significant economic and population growth over the next 20 years. With active development and extension of the existing Kodiak economy, the population of the urban area could double or even triple within this period. Providing housing and services for this population will require considerable community effort and expense. Short-term OCS population growth would compound the difficulty. Therefore, it is recommended that OCS development and infrastructure (housing and services) be kept as separate as possible from the existing urban area. Obviously, if an oil service base and/or terminal develops on Kodiak Island connected to the existing road network, it will be extremely difficult to maintain total separation. However, by maximizing separation, the population growth in the urban area should be limited primarily to gains resulting from growth in the fishing industry and stabilization of Coast Guard manning levels.

An alternative "no growth" strategy would require a community decision not to pursue further economic development. Kodiak would then need less new housing and services, but there would still be serious problems with existing housing, services and degradation of the environment. Solving these existing problems and accommodating future population increases are important aspects of the proposed plan. Assuming that there is to be growth in the Kodiak urban area, it could also be approached in an unplanned manner. However, this would result in urban sprawl and aggravated environmental problems.

The proposal calls for planned development and concentration of housing and services within the present urban area. The result will be higher living densities for many neighborhoods. These densities will range from 6 units per net developed acre in single-family home areas, to 15 units per acre in multi-family apartment areas. Many Kodiak residents have expressed a desire to live at lower residential densities. However, less dense development usually causes more destruction of the natural environment and greater use of energy than that caused by concentrated development. It is also far easier and more economical to provide basic services to a concentrated area. Concentrated development will therefore help to keep housing costs down; these costs are also an expressed concern of Kodiak

residents. Finally, several transportation recommendations have been developed to reduce potential traffic congestion resulting from future development.

Parameters such as soils, slopes, drainage, and tsunami hazard areas have been considered in developing the plan recommendations. No extraordinary amount of grading or fill is anticipated, although minor amounts may be required for certain elements of the plan. The major probable adverse impact on the physical or natural environment will be the loss of trees, particularly with residential development of Spruce Cape. This impact can be mitigated by utilizing a Planned Unit Development approach to preserve open space and vegetation, particularly along drainageways. The plan recommends conserving most of Near Island as a natural area for limited recreational use. Under an earlier plan, Near Island would have been connected to the City with a bridge and almost fully developed. The current plan recommends a ferry, limited industrial development to support the Dog Bay small boat harbor, retention of the remainder of Near Island in its natural state, and protection of water quality in Trident Basin.

As previously noted, the plan proposes higher residential densities. Apartment districts are proposed near the CBD, as well as higher residential densities along both Mill Bay Road and Rezanof Drive. Once in-filling has been substantially completed in existing neighborhoods, expansion of residential land use is proposed toward Spruce Cape (and toward Monashka Bay in the long-term). While the private market can probably provide sufficient medium- to high-cost housing, special planning is required for low-cost housing. Higher densities will help offset some housing costs, particularly for land. The plan also recommends mobile homes as one means of providing low-cost single family housing. Mobile home subdivisions and trailer parks would be kept separate and well buffered from other housing in order to avoid potential advertisements on land values. Establishment of a local housing authority and help from the fish canneries in the form of dormitories for seasonal employees are also recommended to meet the needs for more low-cost housing.

Commercial use is to remain centered in downtown Kodiak for the mid-term. However, only a restricted area is available for expansion outside of the zone flooded by the 1964 tsunami. As population growth occurs in the Spruce Cape - Mill Bay - Island Lake areas, establishment of a second business district is recommended near the intersection of Mill Bay Road and Rezanof Drive. This proposal may cause some concern within the existing business community because it will mean only limited future growth for the present CBD. Limiting such growth is recommended because the present CBD was rebuilt in a hazard zone. By distributing commercial development, with new development on higher ground, the plan attempts to protect the urban area against another total loss of its business district. It also minimizes the potential for congestion and parking problems and would make shopping more convenient for future residents of the northeastern half of the urban area.

Neighborhood shopping is also proposed for several locations along Mill Bay Road. At present, Mill Bay is developing into a commercial strip, with uncontrolled access. This will lead to inefficient use of prime land along a major arterial, traffic congestion and safety problems. Redevelopment of Mill Bay to full arterial standards is recommended. As part of this redevelopment, Mill Bay Road is to become a major focus of neighborhood commercial and higher density residential development. The commercial development would not be dispersed, but would be concentrated in several distinct locations to serve adjoining residential areas.

Public facilities will also have to be expanded to meet existing needs and the needs of future growth. In particular, schools and fire protection must be expanded to reflect the growing population in the northeast urban area. Likewise, existing police staffing and facilities must be expanded to meet growing crime problems. Parks and recreation programs also need attention and these will be addressed in a future study.

There are several unknowns which will affect the future of the urban area. The plan recommends the maintenance of the industrial area in its present form and location. Space for expansion will be very limited in this location until the degree and extent of slide hazard from Pillar Mountain is determined. Also, the present City landfill for solid waste is nearing capacity and is located on land being transferred to a Native corporation. Since economic data on alternative locations is not complete, more study is required to determine a new landfill site. Finally, known historical and archeological sites are recommended to be preserved in the plan. Unfortunately, there is much that is not known about such sites, and further inventories should be undertaken soon prior to potential loss from new development.

In addition to these unknowns, other governmental agencies and private companies can have significant impacts in the future. These include the Coast Guard, with respect to its base and operations; the Corps of Engineers, with respect to Dog Bay and other harbor projects; the Department of Interior, with respect to its land holdings; the Native corporations, with respect to their land holdings and developments; and the course of OCS development which is addressed, but by no means resolved in the plan.

Overall, the plan should improve and protect conditions the physical or natural environment. The main objections to the plan will probably be based upon its recommendations for the human environment, particularly where those recommendations depart from previously stated goals, previously developed plans and/or previously held convictions of business and the general public.