

M·E·MORAN^{16.}

MASTER PLAN

Town of

HARWICH



Massachusetts

Metcalf & Eddy, Inc. ● Engineers & Planners

Boston ● New York ● Palo Alto

MASTER PLAN
for
HARWICH, MASSACHUSETTS

December 1, 1967

Prepared for
Harwich Planning Board
and
Massachusetts Department of
Commerce and Development

The preparation of this report was financially aided through a federal grant from the Urban Renewal Administration of the Housing and Home Finance Agency under the Urban Planning Assistance Program authorized by Section 701 of the Housing Act of 1954, as amended.

HARRISON P. EDDY, JR.
 JOHN W. RAYMOND, JR.
 HARRY L. KINSEL
 EDWIN B. COBB
 JOHN S. BETHEL, JR.
 ANDREW C. PATON
 ROLF ELIASSEN
 DEAN F. COBURN
 CHARLES Y. HITCHCOCK, JR.
 ARIEL A. THOMAS
 FRANCIS A. OBERT
 DAVID A. DUNCAN
 RUSSELL C. HOLT

METCALF & EDDY

STATLER BUILDING · BOSTON · MASSACHUSETTS 02116
 E N G I N E E R S

INC.

CABLE ADDRESS—"METEED - BOSTON"
 (617) 423-5600

CLAIR N. SAWYER, ACS
 ALBERT B. RICH
 MORTON SOLOMON
 CHARLES A. KNAPP
 NATHANIEL CLAPP
 GEORGE H. LIVINGSTON, NAA
 JOHN PODGER
 JAMES R. WOGLOM, AIP
 IVAR VIEHE-NAESS, JR, AIA
 DONALD G. BALL
 ALLEN J. BURDOIN
 JAMES A. FIFE
 WALTER AMORY
 FRANKLIN L. BURTON
 JOHN G. CHALAS
 GEORGE P. FULTON
 GEORGE K. TOZER
 WOODROW W. WILSON

CONSULTANTS
 E. SHERMAN CHASE
 FRANK A. MARSTON

December 1, 1967

Dr. Carl L. Clapp, Chairman
 Harwich Planning Board
 Town Hall
 Harwich, Massachusetts

Dear Dr. Clapp:

We are pleased to submit the accompanying report Master Plan for Harwich, Massachusetts, authorized by Articles of Agreement, dated February 14, 1966.

The individual planning memoranda submitted previously have been revised, edited, and combined into this one report.

A Summary of this report and Proposed New Land Subdivision Regulations and Proposed New Zoning By-Law and Map have been submitted under separate covers.

The initial planning studies were carried out by John J. Pobst, Associate A.I.P., and Stuart R. Loosli, Landscape Architect. This report was prepared by the writer, assisted by other members of his staff under his direction.

Dr. Carl L. Clapp
December 1, 1967

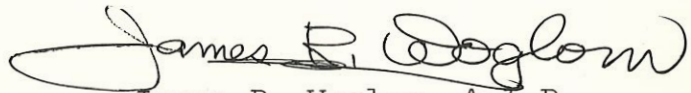
2

This report is divided into three parts:

- I - Background Studies
- II - 1980 Development Plan
- III - Effectuation Program

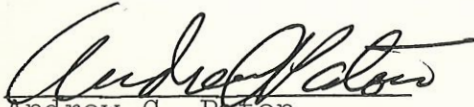
Very truly yours,

METCALF & EDDY, INC.



James R. Woglom, A.I.P.
Director, Community
Planning and Renewal

Approved:



Andrew C. Paton
Senior Vice President

TABLE OF CONTENTS

	<u>Page</u>
LETTER OF TRANSMITTAL	
LIST OF TABLES	ii
LIST OF FIGURES	iv
REPORT	
PART I - BACKGROUND STUDIES	
Area of Influence	1
Existing Land Use	7
Physiography	14
Population	23
Housing	31
Economy	35
Planning District Analysis	45
PART II - 1980 DEVELOPMENT PLAN	
Development Goals	51
Future Land Use	63
Circulation Facilities	67
Community Facilities	77
Public Utilities	108
PART III - EFFECTUATION PROGRAM	
Land Subdivision Regulations	124
Zoning By-Law	125
Capital Improvements Program	127
Economic Development and Tourism	137
Plan Updating and Public Acceptance	139
APPENDIX A	
Harwich Community Survey Questionnaire	A-1

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Population of Cape Cod	2
2	Visitor Expenditures on Cape Cod	3
3	Housing and Residential Land Use Requirements of Cape Cod	3
4	Tabulation of Existing Land Use	9
5	Tabulation of Existing Land Use by Planning District	10
6	Percent of Developed Land by Planning District	11
7	Compared Existing General Land Use	11
8	Compared Existing Land Use Intensity	12
9	Great Ponds	14
10	Land Suitability	18
11	Recommended Minimum Lot Sizes	19
12	Seasonal Peak Population	24
13	Year-Round and Summer Population Distribution by Planning District	24
14	Changes in Population Composition	26
15	Compared Population Characteristics	26
16	Natural Increase and Decrease	27
17	Future Year-Round Age Population Composition	28
18	Future Peak Summer Population	29
19	Change in Housing Units by Planning District	32
20	Total Housing Units and Summer Residences by Planning District	31
21	Housing Units and Structures by Type	33
22	Compared Housing Characteristics	33
23	Compared Labor Force Participation	35
24	Changes in Year-Round Employment	36
25	Changes Between Seasonal and Year- Round Employment by Economic Sector	37
26	Compared Income of the Year-Round Resident	38
27	Percent of Male Labor Force in Selected Occupations	38
28	Firms and Payroll per Firm by Economic Sector	41
29	Condition of Housing - 1960	46
30	Planning District Analysis Summary	47
31	1980 Residential Land Use by Amounts and Intensity	65
32	Land Use Analysis, Future Land Use Plan	66
33	Recommended Highway and Street Cross-Section Standards	69
34	Recommended Street Characteristics	69

LIST OF TABLES cont.

<u>Table</u>		<u>Page</u>
35	Recommended Off-Street Parking Standards	75
36	Recommended Off-Street Loading Standards	76
37	Inventory of Public School Data	78
38	Past School Enrollment Increases by Grade Levels	79
39	Increase in Number of Children Between Birth and Year of School Entrance	80
40	School Enrollments Versus Population	80
41	Estimated Future Public School Enrollments by Grade Levels	81
42	Evaluation of Public Schools	83
43	Estimated Future Public School Space Needs	85
44	Inventory of Public Outdoor Recreation and Conservation Facilities	90
45	Inventory of Public Indoor Recreation Facilities	93
46	Recommended Conservation and Recreation Facilities Standards	94
47	Inventory of Public Buildings and Lands	99
48	Inventory of Principal Cemeteries	100
49	Recommended Public Buildings and Lands Standards	100
50	Recommended Public Sanitary Sewerage System Standards	111
51	Water System Statistics	114
52	Estimated Future Domestic Water Needs	115
53	Recommended Public Water System Standards	116
54	Recommended Storm Drainage Standards	119
55	Recommended Refuse Disposal and Collection Standards	122
56	Compared Valuations, Tax Levies, Tax Rates	128
57	Compared Municipal Debt	129
58	Fiscal Trends	131
59	Fiscal Projections	132
60	Capital Budget for 1968 Capital and Improvement Program by Year 1968-1973	134

LIST OF FIGURES

<u>Fig.</u>		<u>Following page</u>
1	Regional Area of Influence	2
2	Inter-Town Study Areas in the Local Area of Influence	6
3	Existing Zoning Along Town Boundaries in the Local Area of Influence	6
4	Generalized Existing Land Use	8
5	Planning Districts	10
6	Land Values	14
7	Natural Resources	14
8	General Land Suitability	16
9	Predominant Lot Sizes	20
10	Population Changes	24
11	Year-Round Population Densities	26
12	Summer (Peak) Population Densities	26
13	Age - Sex Distribution of Year-Round Population	26
14	Future Year-Round Population	28
15	Potential Housing Areas	34
16	Changes in Seasonal Employment	38
17	Potential Economic Areas	44
18	Location of Blight or Potential Blight	46
19	Sketch of Possible Resort Development Near Nantucket Sound	56
20	Development Adjoining Marsh Lands	56
21	Herring River Marshes and Associated Areas	56
22	Freshwater Creek and Pine Woods Development	58
23	Pond Development	60
24	Cranberry Bog Development	62
25	Village Schematic Layout	62
26	Future Land Use	64
27	Average Daily Traffic	68
28	Highway and Street Deficiencies	68
29	Highways and Streets	72
30	Principal Pedestrian and Bicycle Ways	74
31	Public Schools	78
32	Recreation and Conservation	90
33	Public Buildings and Lands	98
34	Civic Center	104
35	Historical Area	106
36	Public Sewerage and Refuse Systems	108
37	Public Water System	114

PART I

BACKGROUND STUDIES

An important phase in the preparation of a Master Plan is a thorough study of past and existing conditions and trends. Based on these, projections can be made of future needs and their implications upon a Future Development Plan.

Subjects covered by these studies include Area of Influence, Existing Land Use (including land values), Physiography (including land suitability and lot sizes), Population, Housing, Economy, and Planning District Analysis.

AREA OF INFLUENCE

Regional and Local Areas

Harwich is influenced by and in turn influences two areas, one, the regional, consisting of Cape Cod (Barnstable County) and, the other, the local, consisting of the town's neighbors - Brewster, Chatham, Dennis, and Orleans (see Fig. 1).

Characteristics of Cape Cod

Cape Cod is a fragile peninsula of sand and glacial debris possessing great natural beauty and attractiveness. For people from Montreal to Washington, D.C., Cape Cod is one of the leading choices for summer vacationland in New England rivaled only by Martha's Vineyard, Nantucket, and the coast of Maine.

The unique character of Cape Cod is expressed in its indigenous landscape and architecture composed of ocean and sandy beach; salt marsh and salt creek; ever-present cranberry bogs; ponds surrounded by pine woods; virgin areas of native plants and wildlife; houses with naturally weathered shingles; small towns with neat, wood-frame commercial buildings; and boat yards, harbors, sailboats, and old rambling inns on the ocean. These are the major elements which contribute to the total effect of Cape Cod and are also those in the greatest danger of destruction by insensitive and uncontrolled development.

Impact of the Mid-Cape Highway and Route 28

There is little question that the Mid-Cape Highway, Route 6, will soon become a four-lane limited access highway. This will improve accessibility to Harwich and other Mid-Cape and Lower-Cape towns, and in turn will increase development pressures in these towns. The construction of summer residences and the resort industry should experience increased growth.

Route 28 carries the largest volume of traffic on any highway in Cape Cod, winter or summer, including the Mid-Cape Highway. It is not feasible to convert Route 28 into a high-speed road and "sweep clean" its edges of commercial development; it serves a necessary function as the "main street" of Cape Cod.

A current proposal would make Great Western Road in Harwich a Route 28 Alternate. The critical portion of this proposal is in Dennis, Yarmouth, and Barnstable, where several miles of new highway must be built to give the new road a proper connection to the west. If this proposal is carried out, it would generate increased population and economic activity in Harwich Center and North Harwich. It is doubtful if there would be much impact on the resort-commercial businesses along Route 28.

Regional Population Trends

Table 1 shows the existing and expected future population changes on Cape Cod between 1960 and 1980. A 51.4 percent increase in year-round residents is predicted. Summer residents are expected to increase by 88.1 percent, overnight visitors by 94.8 percent, and day-trippers by 73.0 percent. An increase in summer peak population of 75.9 percent is anticipated.

Table 1. Population of Cape Cod

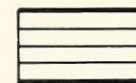
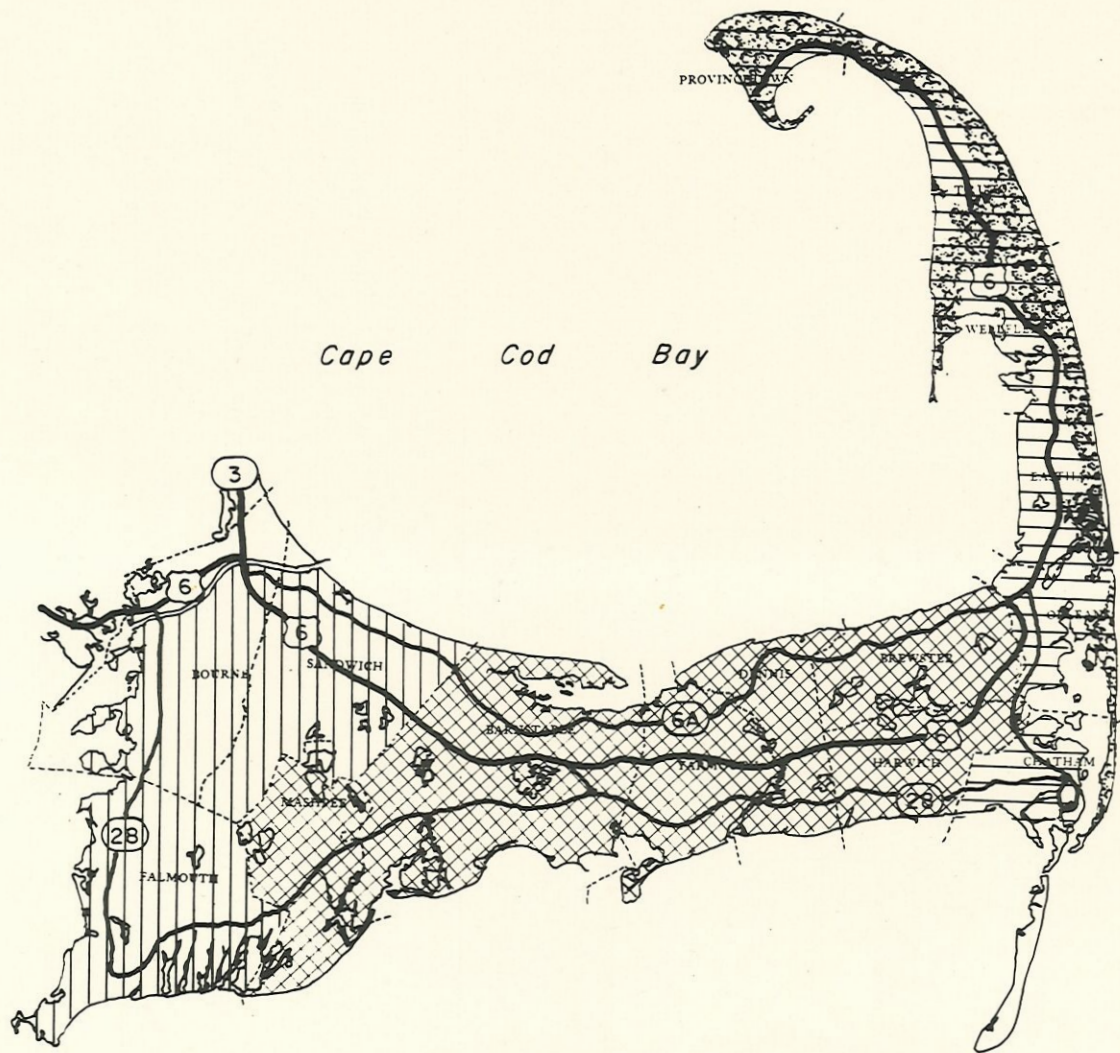
Component	1960	1970	1980
Year-round residents	70,300	86,200	106,400
Summer residents	126,000	176,000	237,000
Overnight visitors	26,900	39,900	52,400
Day-trippers	<u>37,000</u>	<u>49,000</u>	<u>64,000</u>
Total	260,200	351,100	459,800
For summer weekend days, add day-trippers	25,000	33,000	42,000
Summer peak population	285,200	384,100	501,800

Source: Blair Associates Inc., Cape Cod 1980.

Regional Economic Trends

Cape Cod's economic structure consists of two parts: one, the resort industry, and the other, the usual economic activities of a rural county.

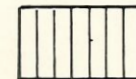
The resort industry has considerable economic potential but is hampered by the short season and inadequate development of the ocean shore and inland areas. Nevertheless, as shown in Table 2, large increases are predicted in future visitor expenditures on Cape Cod.



Lower Cape



Mid-Cape



Upper Cape



Cape Cod
National Seashore

FIG. 1

MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

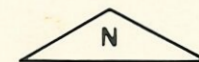
REGIONAL AREA OF INFLUENCE

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

METCALF & EDDY, INC.

ENGINEERS & PLANNERS

BOSTON · NEW YORK · PALO ALTO



NOT TO SCALE

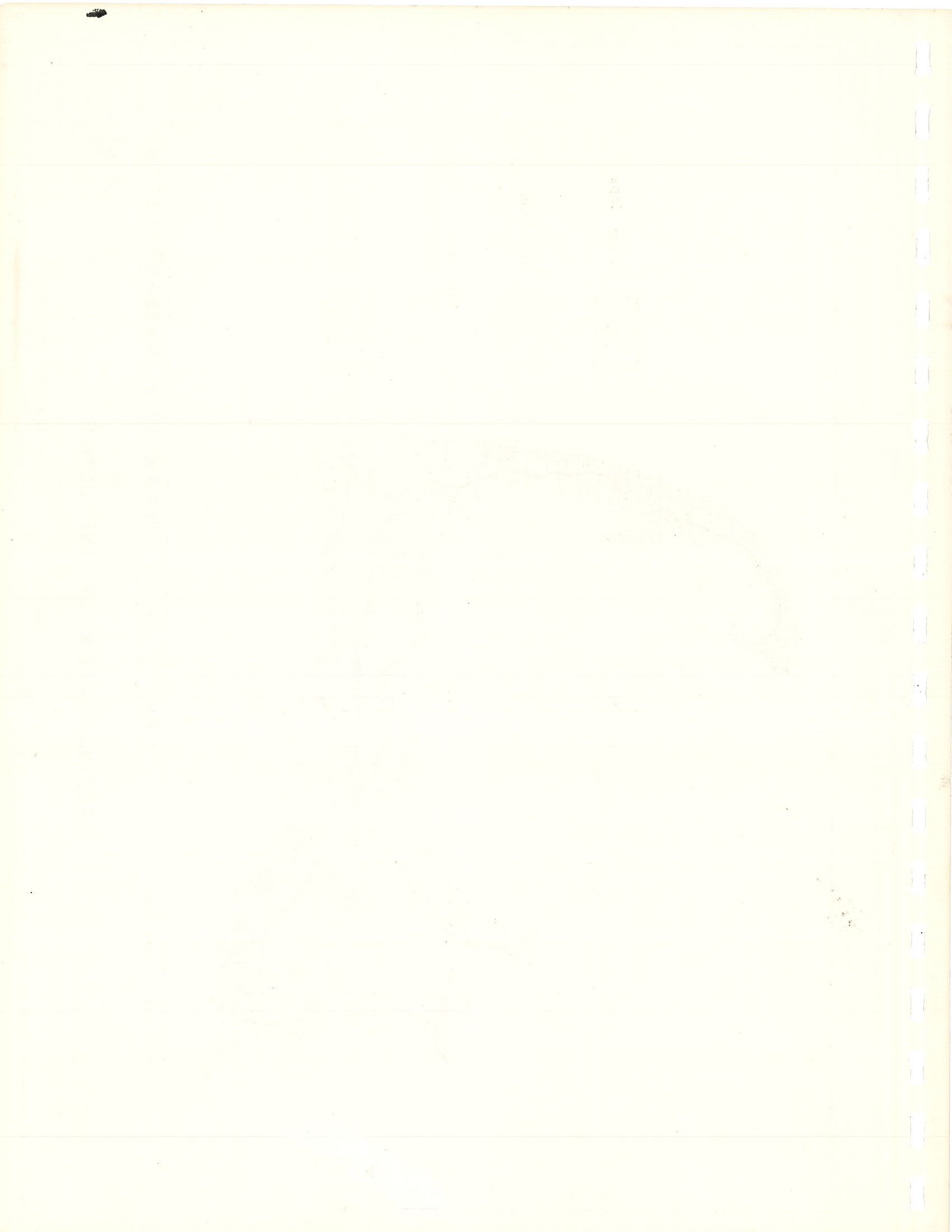


Table 2. Visitor Expenditures on Cape Cod
(in millions of 1960 dollars)

Component	1960	1970	1980
Summer residents	62.3	99.2	150.3
Overnight visitors	15.4	26.4	41.5
Day-trippers	14.0	22.8	35.0
Total	91.7	148.4	226.8

Source: Blair Associates Inc., Cape Cod 1980.

One of the principal reasons for this increase will be the Cape Cod National Seashore. It is predicted that the Seashore will draw visitors at a rate of 10,000 per day by 1970, and 20,000 per day by 1980.*

Many year-round Cape Cod residents feel that the resort industry provides very little direct economic gain. Many resort establishments are owned and operated by off-Cape people. Most summer jobs are seasonal and low paying, so not attractive to regularly employed local persons. Therefore, they are taken by either off-Cape young people or dependent children of year-round residents. Several year-round residents operate guest houses, as a supplement to their regular income. For the most part, however, the income of the year-round and summer residents is unaffected by variations in the resort industry. The lack of an adequate year-round economic base is the principal reason for a predicted future lower increase in per capita income for the year-round resident of Cape Cod than of the rest of Massachusetts, New England, or the United States.

Regional Housing and Land Use Trends

Table 3 shows the predicted number of additional dwelling units and the amount accompanying residential land needed on Cape Cod by 1980.

Table 3. Housing and Residential
Land Use Requirements of Cape Cod⁽¹⁾

Area	Increase in all-year and summer residents	Dwelling units needed	Acreage required	Acreage avail- able
Cape Cod	147,400	40,500	22,500	117,400

1. Between 1960 and 1980.

Source: Blair Associates Inc., Cape Cod 1980.

*Blair Report.

The amount of commercial land required in 1980 is expected to be about 75 percent greater than the amount presently in that use (629 acres). The predicted major growth businesses are hotels, motels, and commercial recreation such as summer theater, miniature golf, drive-in theater, etc.

Increasing Pressures for Land

As the available and developable vacant land decreases, development pressures increase. Land considered in the past as safe from development is no longer in that category.

Assuming continuing general prosperity and population increase along the east coast (the population of the Northeastern States Region grew by 13.2 percent, 1950-1960), more and more people will desire a summer or retirement home on Cape Cod. In addition, the available and developable vacant land in the towns on Cape Cod west of Harwich (Bourne, Sandwich, Falmouth, Mashpee, Barnstable, Yarmouth and Dennis) is becoming scarce so that large-scale subdividers already are being forced on down the Cape to Harwich and beyond. Already most of the towns west of Harwich, particularly Yarmouth and Barnstable, are applying stringent controls over subdividers. This may cause developers to seek other towns with less stringent controls.

Planning Coordination in the Local Area of Influence

At a different level and scale, there are matters affecting Harwich and the adjoining towns of Dennis, Brewster, Chatham, and Orleans, which can be handled locally. In matters of common interest, it is desirable to seek coordination between towns. This can be accomplished through the Cape Cod Planning and Economic Development Commission, and through the sharing of information by the individual Planning Boards of two or more towns.

The Harwich Master Plan is properly related to planning in adjoining towns. It is not desirable to have land uses change abruptly at town boundaries.

Harwich, Chatham, Orleans, Brewster, and Dennis have common problems and needs. Each should preserve the natural environment, while developing a satisfactory arrangement of coordinated land use and facilities.

The need for coordination is particularly evident at specific locations along the boundaries of Harwich. These locations are Route 28 and Lower County Road at the Harwich-Dennis line, vacant wooded lands bordering Harwich on three sides, the Red River and Muddy Creek marshes on the Harwich-

Chatham line, and Long Pond and some smaller ponds on the Harwich-Brewster line. These areas, and others, are identified on Fig. 2.

In West Harwich, at the Harwich-Dennis line, strong commercial development is occurring along Route 28 in Dennis (see area No. 1 on Fig. 2). Near Nantucket Sound, south of Lower County Road, extensive motel development is occurring in Dennis, while little change is noted on the Harwich side of the town line. A study might be undertaken to determine the desirability of treating the area between Herring River and Swan Pond River, south of the marshes, as a natural neighborhood unit.

For many miles the Harwich town boundary passes through vacant wooded lands. Future problems can be avoided by reaching agreement with adjoining towns regarding the appropriate pattern of development in these areas. The Town of Dennis should be consulted regarding the lands north of Swan Pond, the Town of Brewster regarding the lands west of Seymour Pond and the lands along the town line from Mud Pond to Pleasant Bay, and the Town of Chatham regarding the Woodlands along the town boundary from Route 28 to Mill Pond (see areas No. 2, 3, 4, and 5 on Fig. 2).

The Red River marshes should be managed jointly by Harwich and Chatham, since the town boundary passes through them. This is area No. 6 on Fig. 2. There are 76 acres of salt marsh along the Red River, south of Route 28. The importance of salt marshes to fish and shellfish production is well documented.* The apparent need is for protection of the Red River marshes against encroachment by filling or dredging.

Muddy Creek, along the Harwich-Chatham line, is another location where the two towns should coordinate their planning strategy (see area No. 7 on Fig. 2). The Chatham side of Muddy Creek has been almost completely subdivided, while the Harwich side is still in acreage.

Along the Harwich-Brewster boundary there is a series of ponds: Seymour, Black, Long, Mill, Cahoon, Grassy, and Mud (see area No. 8 on Fig. 2). It would be desirable to

*Massachusetts Senate Publication No. 855, January 1965, titled Report of the Department of Natural Resources Relative to the Coastal Wetlands in the Commonwealth.

treat each of these ponds individually, to see what development arrangements might be best in order to prevent the destruction of both scenic and economic values through uncoordinated and overcrowded development.

Area No. 9 on Fig. 2 is the territory north of Dennisport and south of North Harwich, between Swan Pond and the west reservoir on the Herring River. With the purchase of the Guida land by the Town of Harwich, practically all of this land in Harwich, to the east of the common town boundary, is in public ownership.

The common boundary between Harwich and Orleans lies in Pleasant Bay. It is desirable that Harwich, Chatham, and Orleans coordinate their activities in Pleasant Bay, particularly with regard to shellfish and boating (see area No. 10 on Fig. 2).*

Zoning Along Harwich's Town Boundary

Zoning along the Harwich town boundaries, both in Harwich and in adjoining towns, is shown on Fig. 3. There are many discrepancies and conflicts, which this map helps to locate. The need for coordination between towns is evident.

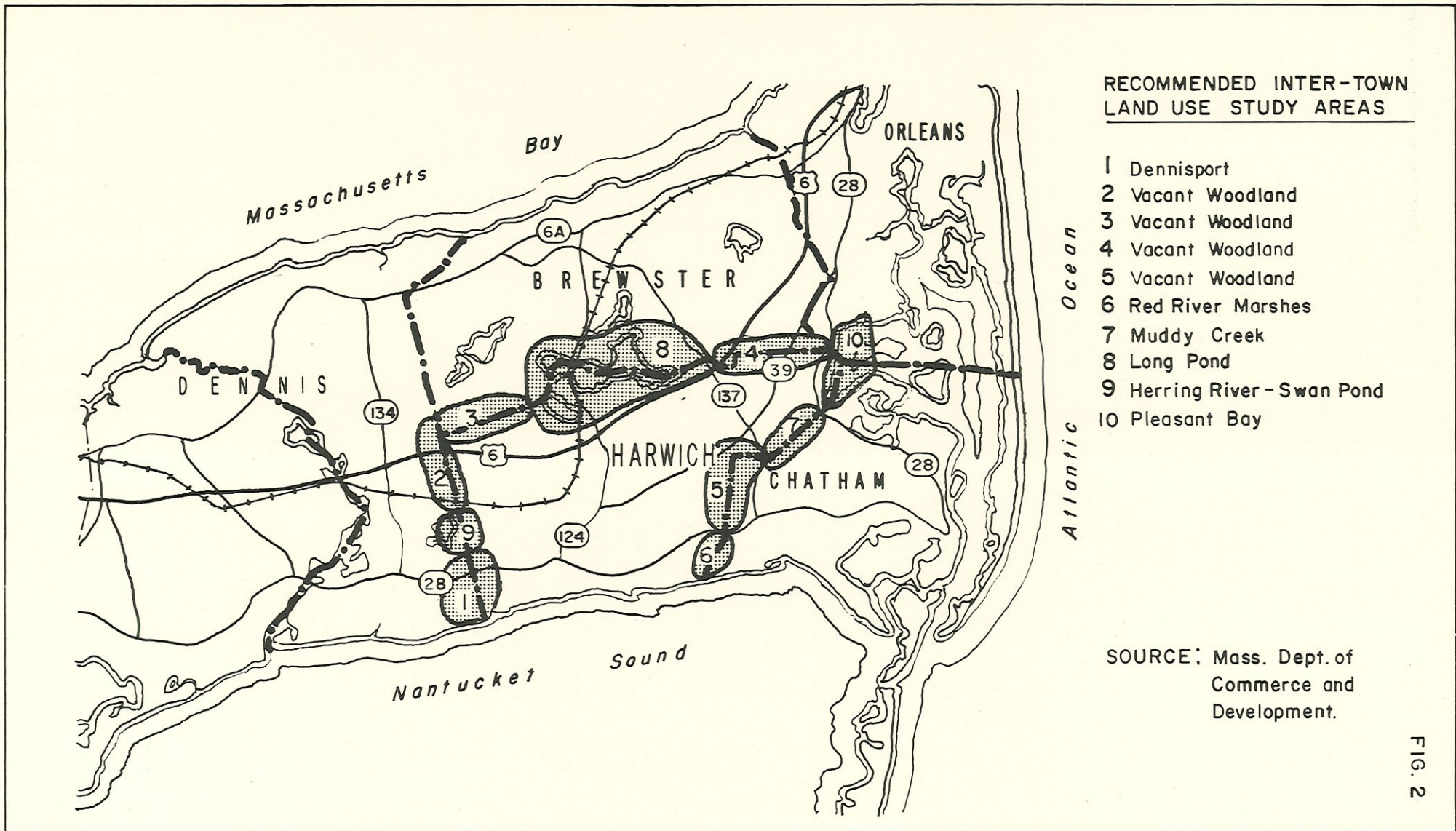
The unrestricted zones in Dennis are a current problem. Conflicts exist between commercial activities on the Dennis side of the common boundary and residential development on the Harwich side.

A continuance of the existing conservancy zones in Harwich is not reflected in the adjoining towns.

The commercial zone in Brewster, on Pleasant Lake Avenue at the Harwich boundary, appears to be premature. There does not appear to be any current need for commercial land at this location.

In East Harwich, the commercial zone in Chatham has a much greater depth than the one in Harwich.

*A study of Pleasant Bay by the U. S. Army Corps of Engineers is already underway.



**RECOMMENDED INTER-TOWN
LAND USE STUDY AREAS**

- 1 Dennisport
- 2 Vacant Woodland
- 3 Vacant Woodland
- 4 Vacant Woodland
- 5 Vacant Woodland
- 6 Red River Marshes
- 7 Muddy Creek
- 8 Long Pond
- 9 Herring River - Swan Pond
- 10 Pleasant Bay

SOURCE: Mass. Dept. of
Commerce and
Development.

FIG. 2

MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

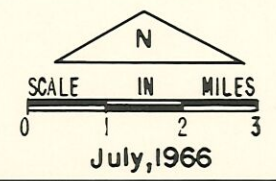
**INTER-TOWN STUDY AREAS IN THE LOCAL
AREA OF INFLUENCE**

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

METCALF & EDDY, INC.

ENGINEERS & PLANNERS

• BOSTON · NEW YORK · PALO ALTO



EXISTING LAND USE

Survey and Mapping*

In June 1966 a survey was made in the field, parcel-by parcel, of all existing land uses in Harwich. These land uses were recorded on a set of Assessor's Maps, using a three-digit land use classification system based on the one developed by the Central Massachusetts Regional Planning Commission. A copy of this three-digit land use code, a map of Harwich at the scale of 1" = 660' showing all land use numerically coded, and a hand-colored map at the scale of 1" = 660' showing ten classifications of land use, generally from the three-digit classifications, are on file with the Planning Board. Fig. 4 is a generalized representation of this map.

The ten land use classifications are defined as follows:

Developed**

Intensive Agriculture

Cranberry bogs, orchards, farm structures, etc., but not including cropland and pastures.

Residential

Single-, two-, and multifamily residential structures, plus yards and outbuildings.

Retail and Service

Retail sales such as restaurants, gasoline service stations, etc.; and services such as barbers, realtors, doctors, dentists, etc.

*Principal building (public buildings) are shown on Fig. 33 in the section on Community Facilities of Part II of this report.

**Mixed uses do not present a serious problem in Harwich. There were not many of these and usually the principal use could be easily identified. The individual uses in mixed-use parcels are noted on the large "Existing Land Use Map," on file with the Harwich Planning Board.

Lodging

Hotels, motels, and cottages. Guest Houses were noted as mixed uses, but classified as residential for purposes of general analysis.

Industrial and Kindred

Manufacturing industries of all types; industrial services such as auto body shops and laundries; transportation, communications, and utilities; and contractors' yards and warehouses.

Institutional

Public buildings and lands other than recreational such as: town hall, police station, fire station, school, etc.

Circulation

Streets, bridges, parking areas, railroads, and pedestrian or riding trails.

Open Space

Nonrecreational

Cropland, pastures and other nonintensive agricultural uses, and intensive landscaped areas and other nonrecreational uses furnishing extensive open view, but not including land suitable for recreational use.

Recreational

Playgrounds, beaches, golf courses, etc., and also land not developed for recreational uses, but suitable for recreation, such as large tracts of undeveloped woodland; but not including wetlands and water bodies.

Wetlands and Water

Salt marshes, swamps, ponds, and rivers.

Pattern

From an examination of Fig. 4, the relationship between the development pattern and the water can be readily observed. Within one mile of Nantucket Sound the land is largely developed and consists almost exclusively of residences and commercial (retail and service and lodging) uses. The other principal residential and commercial area is Harwich Center. Smaller residential centers are located in North Harwich,

between Hinckley's and Long Ponds, around Josephs and Bucks Ponds, in East Harwich and adjacent to Pleasant Bay. The remaining residential uses are strung out singly or in small groups along highways and streets and around ponds throughout the town.

The most noticeable aspect of commercial land use is its linear pattern along Route 28 - the principal highway connecting the centers of the various towns lying on the southern side of the Cape.

Industrial and kindred and institutional uses are distributed individually and largely on small parcels throughout the town.

The major portion of the town area not adjacent to Nantucket Sound or around Harwich Center is classified as intensive agriculture, recreational open space, nonrecreational open space, and wetlands and water.

Tabulation

The acres of each developed and open space land use, together with percentages, are shown in Table 4.

Table 4. Tabulation of Existing Land Use

Use	Acres	Percent of developed	Percent of total
<u>Developed</u>			
Intensive agriculture	560.2	14.8	3.9
Residential	1,671.2	44.2	11.7
Retail and service	57.8	1.5	0.4
Lodging	103.1	2.7	0.7
Industrial and kindred	197.6	5.2	1.4
Institutional	86.9	2.3	0.6
Circulation	<u>1,108.1</u>	<u>29.3</u>	7.7
	3,784.9	100.0	
<u>Open Space</u>			
Nonrecreational	613.1		4.3
Recreational	7,918.1		55.2
Wetlands and water	<u>2,026.2</u>		<u>14.1</u>
Total	14,342.3		100.0

Source: 1966 Field Survey by Metcalf & Eddy, Inc.

As can be seen from Table 4, the principal developed use is residential and the principal open space use is recreational. In comparison with similar year-round municipalities, Harwich is low in percent of industrial and institutional uses. Of the 14,324.2 acres in the town, 3,784.9 acres (including circulation), or only 26.4 percent, are developed. Harwich has enough land left for development to make a marked difference in its future land use pattern.

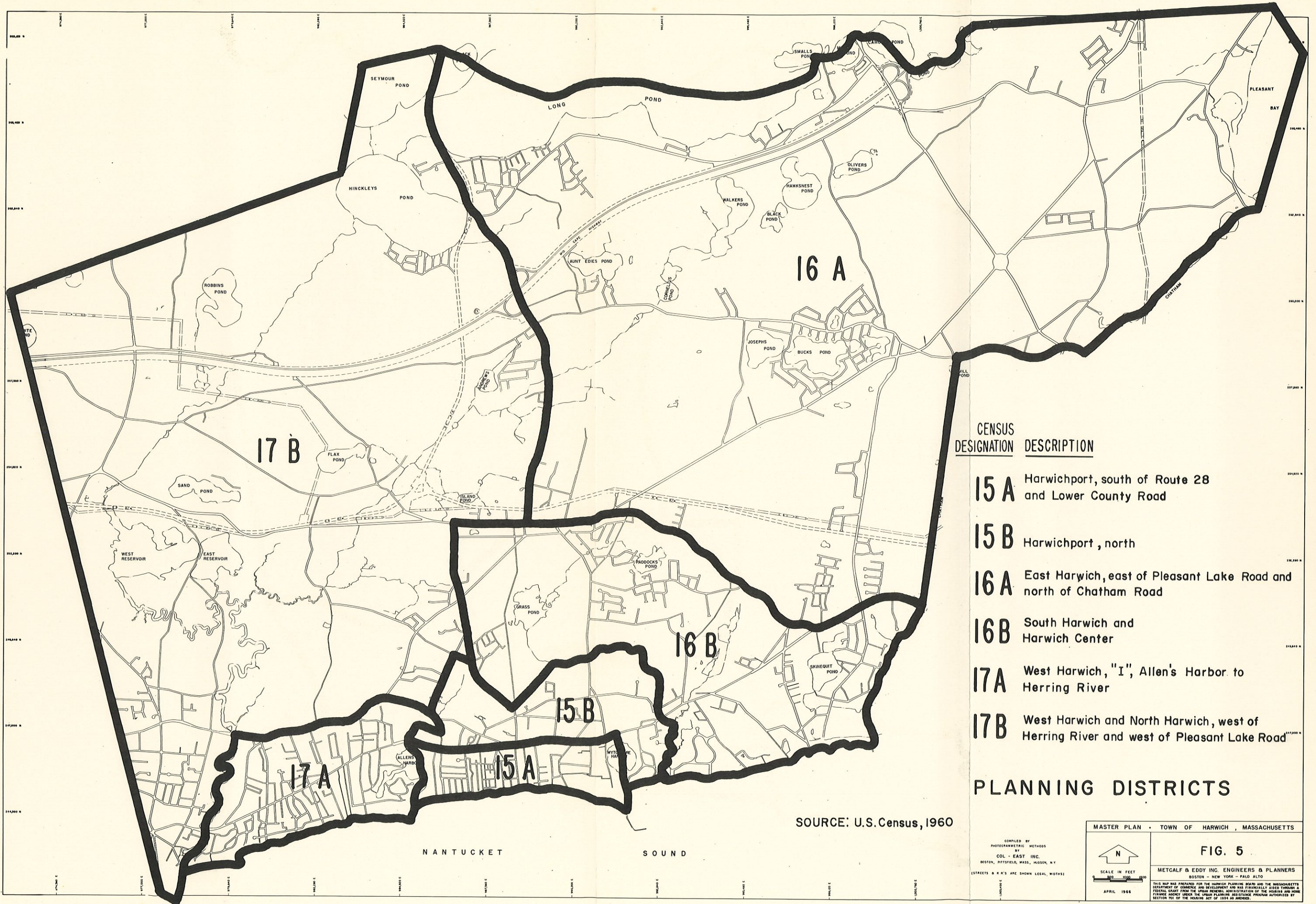
For purposes of showing the existing land use pattern and percentage of development in various areas of Harwich, the town was divided into planning districts. Existing land use by planning district is shown in Table 5, and percentage of development by planning district in Table 6. For ease in the population, housing, and other background studies, the enumeration districts of the 1960 U.S. Census were used as planning districts (see Fig. 5).

Table 5. Tabulation of Existing Land Use by Planning District

Uses	Planning district*						Total
	15a	15b	16a	16b	17a	17b	
	(in acres)						
<u>Developed</u>							
Intensive agriculture	0.0	16.0	92.3	77.1	5.4	369.4	560.2
Residential	121.6	181.9	375.7	362.4	225.7	403.9	1671.2
Retail service	4.2	11.8	5.0	4.7	10.5	21.6	57.8
Lodging	14.5	6.5	16.2	23.6	6.5	35.8	103.1
Industrial and kindred	0.3	2.6	97.2	5.6	2.2	89.7	197.6
Institutional	1.4	1.6	55.4	19.6	2.8	6.1	86.9
Circulation	22.5	32.2	476.9	105.2	58.1	413.2	1108.1
Total acres	164.5	252.6	1118.7	598.2	311.2	1339.7	3784.9
<u>Open space</u>							
Non-recreational	3.3	51.6	257.8	113.4	19.7	167.3	613.1
Recreational	40.7	62.5	4438.1	509.5	112.3	2755.0	7918.1
Wetlands and water	13.4	44.3	769.1	207.8	45.5	946.1	2026.2
Total	57.4	158.4	5465.0	830.7	177.5	3868.4	10557.4
Total acres	221.9	411.0	6583.7	1428.9	488.7	5208.1	14342.3

*See Fig. 5 for location of planning districts.

Source: 1966 field survey by Metcalf & Eddy, Inc.



CENSUS DESIGNATION	DESCRIPTION
15 A	Harwichport, south of Route 28 and Lower County Road
15 B	Harwichport, north
16 A	East Harwich, east of Pleasant Lake Road and north of Chatham Road
16 B	South Harwich and Harwich Center
17 A	West Harwich, "I", Allen's Harbor to Herring River
17 B	West Harwich and North Harwich, west of Herring River and west of Pleasant Lake Road

PLANNING DISTRICTS

SOURCE: U.S. Census, 1960

MASTER PLAN - TOWN OF HARWICH, MASSACHUSETTS

FIG. 5

METCALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALO ALTO

SCALE IN FEET
0 500 1000 1500

APRIL 1966

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF CONSERVATION AND DEVELOPMENT AND WAS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN HOUSING ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

COMPILED BY
PHOTODIAGRAMMETRIC METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.
STREETS & R.R.'S ARE SHOWN LEGAL WIDTHS

Table 6. Percent of Developed
Land by Planning District

Planning district	Percent developed of total acreage
15a	74.1
15b	61.5
16a	20.5
16b	41.9
17a	63.7
17b	25.7
Total Town	26.4

Source: 1966 field survey by Metcalf & Eddy, Inc.

As shown in Table 7, in comparison with its neighbors, Harwich has the second highest number of both acres developed and acres available for development, and the highest percentage of developed land of total town area. Harwich's percentage of developed land is approximately the same as the figure for Cape Cod as a whole. Harwich is wide open to future development.

Table 7. Compared Existing General Land Use*

Area	Acres developed	Percent developed total town acres	Acres available for development**
Brewster	400	27.8	9,500
Chatham	1,800	17.6	3,400
Dennis	2,600	19.7	7,300
Harwich	2,300	17.2	8,600
Orleans	1,200	13.5	5,500
Cape Cod	34,800	13.8	117,400

*As of 1962. Note difference with 1966 Harwich survey.

**Does not include undeveloped land reserved for a specific purpose such as National Seashore and other large public holdings.

Source: Blair Associates Inc., Cape Cod 1980.

Intensity

As shown in Table 8, in comparison with its neighbors, Harwich has the fourth most intensive land use pattern during the winter, and also the fourth most intensive pattern based on the population on an average summer day. All of these towns are approaching an urban intensity of land use during the winter and actually are urban during the summer (usually considered less than 0.20 acres per person). This implies consideration of the need for urban services such as water, sewerage, sidewalks, etc.

Table 8. Compared Existing Land Use Intensity*

Area	Developed acres per person-year-round residents	Developed acres per 100 persons-year-round and summer residents
Brewster	0.32	0.08
Chatham	0.55	0.14
Dennis	0.70	0.11
Harwich	0.61	0.17
Orleans	0.51	0.18
Cape Cod	0.50	0.18

*As of 1960.

Source: Blair Associates Inc., Cape Cod 1980.

Land Values

Basic per acre values of land in Harwich, as developed by the recent reassessment procedure, are presented on Fig. 6.

These estimates of value are based on records of actual sales; and where there have been no sales, there is no estimate of land value. One of the principal reasons for lack of sales in inland areas and, hence, lack of development is the inability to obtain clear ownership titles.

Sharp increases of value are evident along the salt-water, along Route 28, along the shores of ponds, and in small commercial centers such as Harwich Center. Land fronting on Nantucket Sound can run as high as \$52,000 per acre. As a result, a continuance of pressures for intensive development in this area is severe. Undeveloped areas with good accessibility are valued generally at \$2,000-\$3,000 per acre.

These land values reflect both residential and commercial desirability of land. It is probable that there will be little future change in relative land values in the fully developed areas along Nantucket Sound. However, the undeveloped areas are subject to considerable increase in values when access and public utilities are provided.

Future Development

Based on present trends, it is predicted that by 1980 developed land in Harwich will increase from the present 3,800 acres (including circulation) to 5,800 to 6,500 acres, or approximately double. It is expected that the principal increase in land use will be residential. The individual breakdown for expected future development between various land uses will be discussed in following sections of this report.

The impending pressures for development are fantastic. It is expected that most of this new development will take place around inland ponds and in the area directly east of Harwich Center (see Fig. 6).

PHYSIOGRAPHY

Natural Resources

The natural resources of Harwich are exceptional in variety and amount. The town has approximately 4 miles of salt-water beach frontage, the town contains all or portions of 16 fresh-water ponds each over 10 acres in size (Great Ponds)(see Table 9), seven other smaller fresh-water ponds, two fresh-water creeks (Herring and Red Rivers), a salt-water creek (Muddy Creek), and hundreds of acres of cranberry bogs, salt marshes, and other wetlands. Over 75 percent of the town area is covered with woods, principally of the pine variety. The most prominent of these natural resources are shown on Fig. 7.

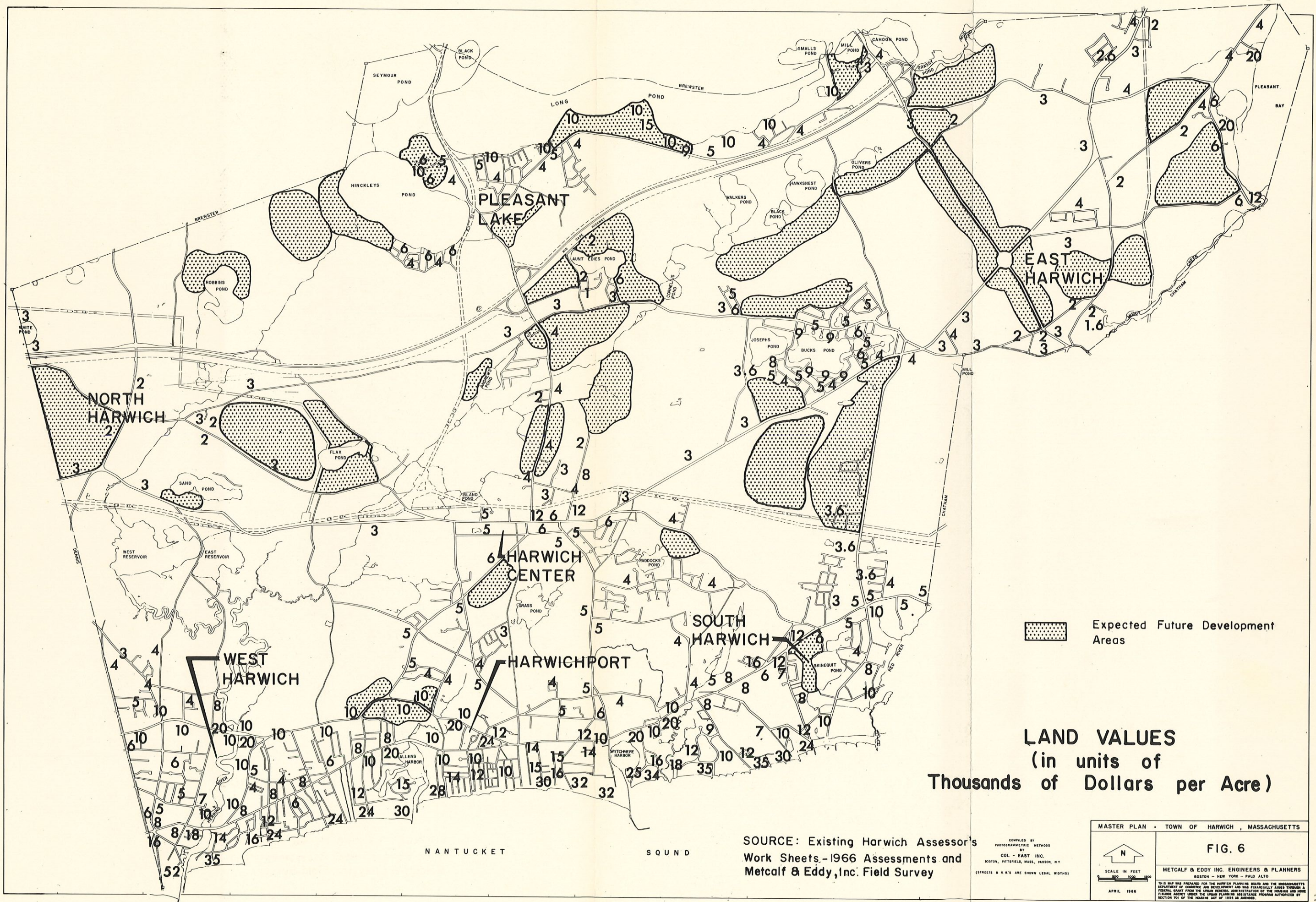
Table 9. Great Ponds*

Name	Area (acres)	Depth in feet		Elevation feet
		Average	Maximum	m.s.l.**
A. Bucks	29	13.7	36	30
B. Cornelius	21	-	-	32
C. Flax	15	-	-	20
D. Grass	46	1	3	9
E. Hawks Nest (Walkers Pond)	30	15	27	32
F. Herring River	65	-	-	-
G. Hinckleys (Pleasant Lake)	171	13	22	28
H. Josephs	19	-	-	30
I. Long Pond	743	25	57	31
J. Olivers	12	-	-	31
K. Robbins	28	6	12	29
L. Sand	21	11	25	13
M. Seymour	181	20	38	29
N. Skinequit	19	-	-	8
O. Walkers	25	15	27	32
P. White	10	-	-	27

*Does not include Aunt Edies Pond (21 acres). Reason unknown why not listed as a Great Pond.

**Mean sea level.

Source: Mass. Dept. of Natural Resources.



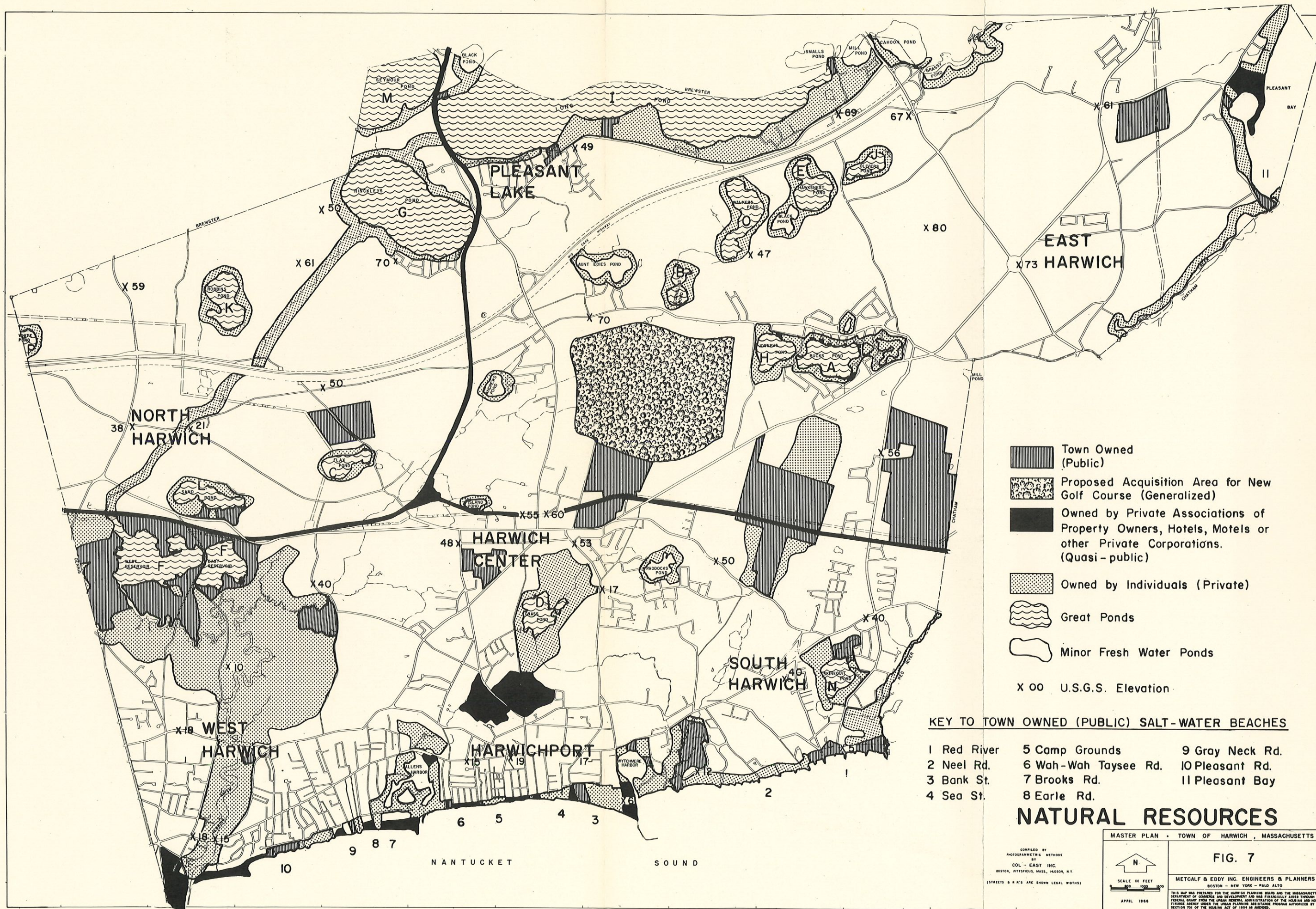
Expected Future Development Areas







LAND VALUES
 (in units of
 Thousands of Dollars per Acre)

SOURCE: Existing Harwich Assessor's Work Sheets - 1966 Assessments and Metcalf & Eddy, Inc. Field Survey

COMPILED BY
 PHOTOGRAMMETRIC METHODS
 BY
 COL. - EAST INC.
 BOSTON, PITTSFIELD, MASS., HOSON, N.Y.
 (STREETS & R.R.'S ARE SHOWN LEGAL WIDTHS)

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS	
 SCALE IN FEET APRIL 1966	FIG. 6 METCALF & EDDY INC. ENGINEERS & PLANNERS BOSTON - NEW YORK - PALO ALTO <small>THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF COMMUNITY AND DEVELOPMENT AND WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING AND URBAN DEVELOPMENT DEPARTMENT UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.</small>



-  Town Owned (Public)
-  Proposed Acquisition Area for New Golf Course (Generalized)
-  Owned by Private Associations of Property Owners, Hotels, Motels or other Private Corporations. (Quasi-public)
-  Owned by Individuals (Private)
-  Great Ponds
-  Minor Fresh Water Ponds
- X 00 U.S.G.S. Elevation

KEY TO TOWN OWNED (PUBLIC) SALT-WATER BEACHES

- | | | |
|-------------|----------------------|-----------------|
| 1 Red River | 5 Camp Grounds | 9 Gray Neck Rd. |
| 2 Neel Rd. | 6 Wah-Wah Taysee Rd. | 10 Pleasant Rd. |
| 3 Bank St. | 7 Brooks Rd. | 11 Pleasant Bay |
| 4 Sea St. | 8 Earle Rd. | |

NATURAL RESOURCES

COMPILED BY
PHOTOGRAMMETRIC METHODS
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.
(STREETS & R.R.'S ARE SHOWN LEGAL WIDTHS)

MASTER PLAN - TOWN OF HARWICH, MASSACHUSETTS

FIG. 7

METCALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALO ALTO

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF CONSERVATION AND DEVELOPMENT AND WAS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE ARMY FEDERAL ADMINISTRATION OF THE HOUSING AND HOME FINANCIAL AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

APRIL 1966

Topography

The terrain is fairly level in the southern portion of the town along Nantucket Sound, rising to elevations of 15 to 20 ft. m.s.l. on the western and central portions of Route 28 and 30 to 40 ft. m.s.l. on the eastern portion of Route 28. The central and northern portions of the town contain several rolling hills with elevations of 70 to 80 ft. m.s.l., but in general land in these areas lies between elevations of 50 to 60 ft. (see Fig. 7 for location of typical elevations).

Climate

The climate is temperate and considered ideal for the New England states. The normal temperatures are 31.7 deg. F. in January and 71.1 deg. F. in July. Annual precipitation averages 40.28 in. Annual snowfall is light. The prevailing wind is from the southwest.

Detailed Soils

In conjunction with the preparation of this report, the Soil Conservation Service of the U. S. Department of Agriculture carried out an operational (detailed) soils survey. This survey identified in the field from borings the types, position, and water content of all soils in Harwich. These soils were evaluated for their limitations or relationship (suitability) for the following six uses:

1. Septic tank sewage disposal
2. Wetland wildlife sites
3. Woodland
4. Sanitary landfill (trench method)
5. Home sites
6. Roads.

In addition, soils were evaluated for the following three characteristics:

1. Depth to seasonal high water table
2. Land slope
3. Surface runoff.

An individual detailed map for each use or characteristic was prepared at a scale of 1" = 660' and is on file with the Harwich Planning Board. An accompanying interpretative report describes the survey and spells out in detail the limitations or relationship for each use.

General Soil Areas

Fig. 8 identifies the three general soil areas found in Harwich. These general soil areas are sufficient for general planning purposes and for determining the limitations of large areas of land for residential, commercial, industrial, recreational, streets, utilities, and other uses.*

A single soil, Carver coarse sand, is dominant within the town. Tracts of this soil were separated on the General Soil Map on the basis of two kinds of terrain, namely, that with moderate or gentle slopes and terrain with strong and steep slopes.

Another general soil area was used to include all of the wet soils. Although the properties of the individual soils in the latter area vary greatly, all have about the same degree of limitation for specific uses.

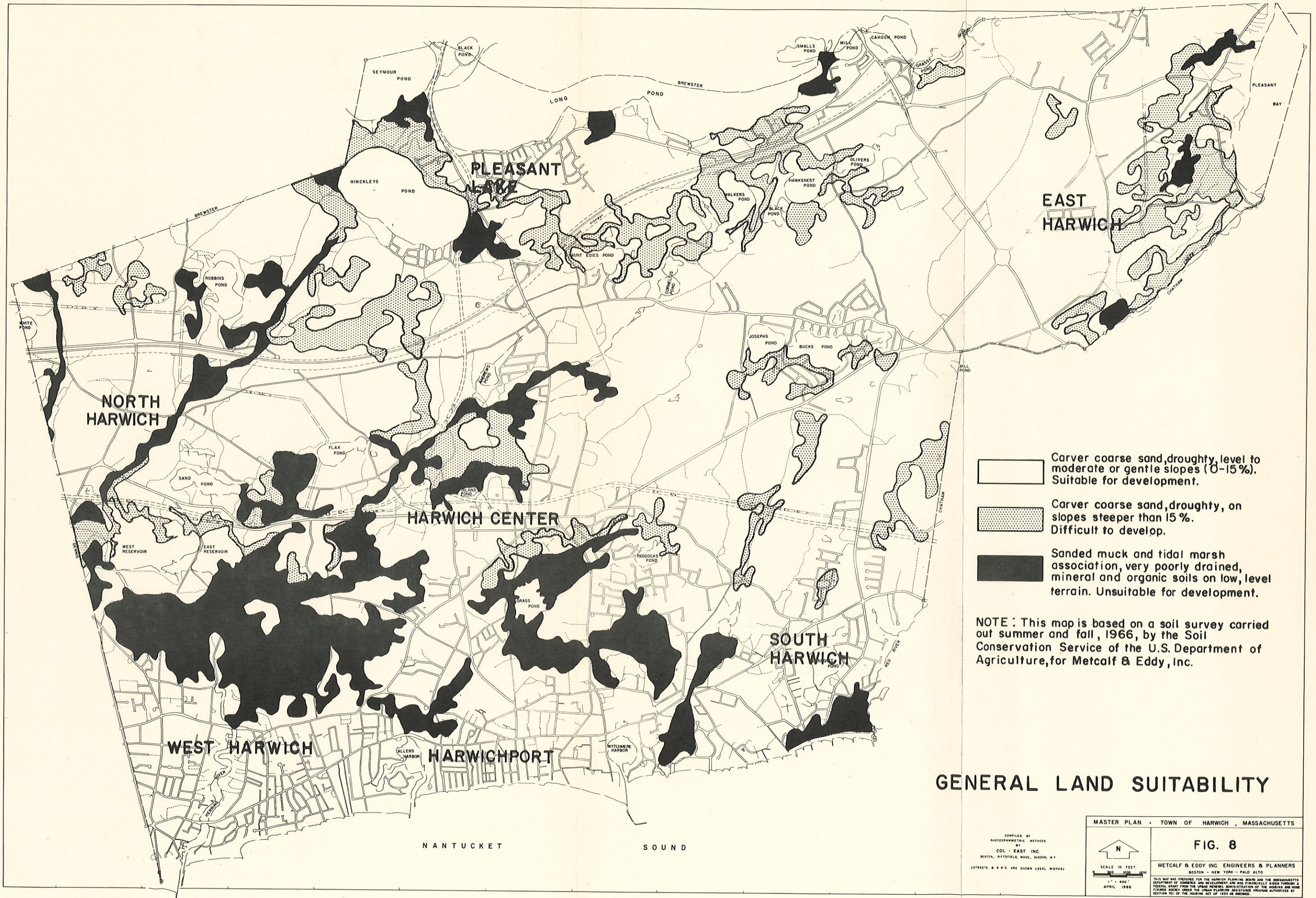
1. Carver soils, coarse sand, droughty, level to moderate or gentle slopes (0-15 percent).

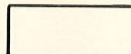


This general soil area occupies about 70 percent of the town area. An extensive tract occupies the southern part of the town, and smaller tracts are scattered throughout the town. The general area comprises the less-sloping parts of a pitted and dissected outwash plain.

Carver soils have a coarse sand surface that is underlain by deep deposits of coarse sand that contains streaks of gravel and a few cobblestones in some places. The sand contains quartz and feldspar grains, mostly, with very few dark minerals present. Except for a few low wet spots, the general area is almost entirely Carver soils.

This general soil area has slight limitations for wildlife and some kinds of recreational use. The droughty nature of the soil is the chief deterrent of the general area for residential, commercial, industrial, and similar developed uses. The coarse loose sands are very permeable and can absorb large amounts of sewage effluent, but little filtering action is provided and groundwater may become polluted near sources of contamination. The loose, coarse substratums also act as a vast reservoir for underground water, and wells located within the area usually will yield large volumes of water.



*Soils and their use limitations for individual sites should be evaluated only from the detailed soil maps on file with the Harwich Planning Board and, in some cases, with additional soil borings.



-  Carver coarse sand, droughty, level to moderate or gentle slopes (0-15%). Suitable for development.
-  Carver coarse sand, droughty, on slopes steeper than 15%. Difficult to develop.
-  Sanded muck and tidal marsh association, very poorly drained, mineral and organic soils on low, level terrain. Unsuitable for development.

NOTE: This map is based on a soil survey carried out summer and fall, 1966, by the Soil Conservation Service of the U.S. Department of Agriculture, for Metcalf & Eddy, Inc.

GENERAL LAND SUITABILITY

COMPILED BY PHOTODUPLICATION METHODS BY COL - EAST, INC. BOSTON, PITTSFIELD, MASS., HUDSON, N.Y. <small>(STREETS & R.A.'S ARE SHOWN LEGAL WIDTHS)</small>		MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS  SCALE IN FEET  APRIL 1966	FIG. 8 METCALF & EDDY INC. ENGINEERS & PLANNERS BOSTON - NEW YORK - PALO ALTO <small>THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF COMMUNITY DEVELOPMENT AND FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN PLANNING AND DESIGNATION OF THE HOUSING AND HOME FINANCING UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 201 OF THE HOUSING ACT OF 1954 AS AMENDED.</small>
--	--	---	---

2. Carver soils, coarse sand, droughty, on slopes steeper than 15 percent.

This general soil area occupies about 15 percent of the town area. Tracts are scattered throughout the northern two-thirds of the town. These are the strongly and steeply sloping parts of a pitted and dissected outwash plain. Many slopes are abrupt; some rise 40 to 50 ft. in elevation within a lineal distance of 100 ft.

Carver soils have a coarse sand surface that is underlain by deep deposits of coarse sand, pebbly in many places and containing a few cobblestones in some. There are a few dark weatherable minerals in the Carver soil material. Feldspar and quartz are the chief mineral components. The bottoms of some of the deeper kettleholes within the area are nearly at the elevation of the water table, and are seasonally wet.

This general soil area has slight limitations for wildlife and for some kinds of recreational use. Groves of scrub oak and locust provide mast for deer and seed for quail. A vast reservoir for underground water is provided by these loose, coarse sands. Little filtering action is provided, however, and water is easily contaminated if a source of pollution is nearby. Steepness of slope limits the use of the general area for residential or similar purposes, and severe erosion can undermine roadways built into slopes and subjected to concentrated runoff.

3. Sanded muck and tidal marsh association, very poorly drained, mineral and organic soils on low, level terrain.

This association occupies about 15 percent of the town area. Most is in the southern part where there are extensive areas of marsh and cranberry bogs. Smaller tracts occupy drainage ways and sites adjacent to ponds. About 60 percent of the association is made up of sanded muck, 25 percent is tidal marsh, and the balance is made up of an assortment of sandy mineral soils and organic soils that are water saturated for extended periods of time.

Sanded muck is a special development for cranberry production. About a foot of sand has been added to the surface of the original organic soils. Ditches have been dug and water-control structures installed. The aim is to allow the areas to be quickly flooded in spring and fall and to be partially drained during the summer. Also, bogs have been built on very poorly drained mineral soil. Tidal marshes are

subject to inundation by sea water. Their composition varies greatly but most have a thick organic surface layer. Tidal marshes are separated from adjacent areas of peat or muck, chiefly on the basis of kind of vegetation. Poorly drained Au Gres and very poorly drained Scarborough soils are loamy sands underlain by coarse sand. A water table is at or near their surface for seven or more months during years of normal rainfall.

Many tracts within the area provide good habitat for wetland wildlife, or can be improved for this use with relative ease. Because of wetness, this general soil area has severe limitations for residential, commercial, industrial, and similar developed uses. In addition, these organic soils, in comparison with mineral soils, can support only very light weights.

Land Suitability

The percent of land that is suitable for various general land uses is shown in Table 10.

Table 10. Land Suitability

Use	Percent of land		
	Suitable*	Difficult to develop	Not suitable
Residential, commercial, industrial, or similar developed uses and buildings	0	75.4	24.6
Streets	41.4	23.4	35.2
Woodland	3.7	0.6	95.7
Wetland-wildlife	8.2	4.0	87.8
Conservation or recreation open space	100.0	0.0	0.0
On-lot sewerage	40.0	22.4	37.6
On-lot water	73.2**	1.4**	25.4
On-lot drainage	74.1	3.8	22.1
Sanitary landfill	40.0	35.4	24.6

*Usually defined as particularly suitable.

**If no source of groundwater contamination is located nearby.

Source: USDA Soil Survey, 1966.

Lot Size

Predominant existing lot sizes in the developed areas of Harwich are shown on Fig. 9. There are many small or less than 10,000-sq. ft. lots in the southern portion of Harwich, principally in the vicinity of Allens Harbor. Most of the lots adjacent to inland ponds are in the 10,000- to 19,000-sq. ft. category. During recent years the predominant lot size for new building has been 15,000 sq. ft.

Minimum lot size recommendations, based only on land suitability and utilities, are presented in Table 11, with sources and notes indicating the reason for selecting these values.

Table 11. Recommended Minimum Lot Sizes

Required utilities	Minimum lot sizes		
	Well to average drained soils and groundwater below 4.5 ft., suitable land	Poorly drained soils and groundwater below 4.5 ft., difficult to develop land	Wet soils and groundwater at or near surface, not suitable land
Public storm drainage system (curbs, gutters, pipes, pump stations, etc.)	20,000 sq.ft.	40,000 sq.ft.	Not suitable
Private storm drains (swales, occasional pipe, etc.)	40,000 sq.ft.	40,000 sq.ft.	Not suitable
Public sanitary sewerage system (pipes, pump stations, treatment facilities, etc., and public water system)	Under 10,000 sq.ft.	Under 10,000 sq.ft.	Possibly suitable

Table 11 cont. Recommended Minimum Lot Sizes

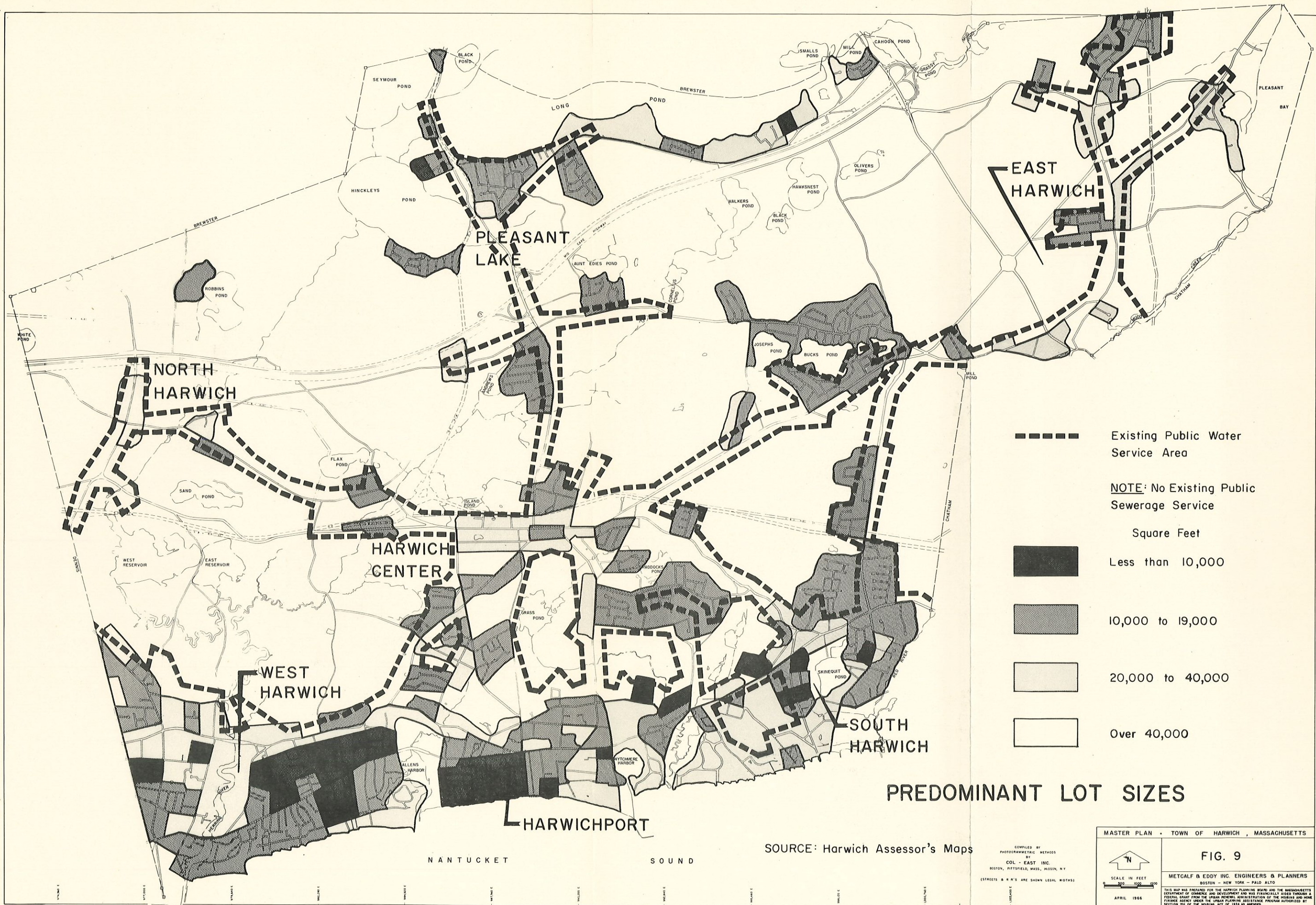
Required utilities	Minimum lot sizes		
	Well to average drained soils and groundwater below 4.5 ft., suitable land	Poorly drained soils and groundwater below 4.5 ft., difficult to develop land	Wet soils and groundwater at or near surface, not suitable land
Private on-lot sewerage system (septic tank-leaching field) and private on-lot water system (artesian or gravel-packed deep well)	40,000 sq.ft.	40,000 sq.ft. but preferably 50,000 sq.ft.	Not suitable
Public water system (source, pump stations, pipes, storage tanks, etc.) and private on-lot sewerage system	20,000 sq.ft.	40,000 sq.ft.	Not suitable
Private on-lot water system (well) and public sewerage system	40,000 sq.ft.	40,000 sq.ft.	Not suitable

NOTE: 1 acre = 43,560 sq.ft.

Sources: Drainage - Experience throughout the United States.

Water - Groundwater for domestic use originates as rainfall. Assuming a 100 percent safety factor to allow for uneven availability of groundwater and variations in the amount of precipitation during the several months of the year, there should be about 5-3/4 in. of precipitation available annually for domestic water supply.

For a house with its own well on an acre of ground, this means that there are about 150,000 gallons of groundwater available for domestic use per year, or about 420 gpd. (gallons per day).



----- Existing Public Water Service Area

NOTE: No Existing Public Sewerage Service

- Square Feet
- Less than 10,000
 - 10,000 to 19,000
 - 20,000 to 40,000
 - Over 40,000

PREDOMINANT LOT SIZES

SOURCE: Harwich Assessor's Maps

MASTER PLAN - TOWN OF HARWICH, MASSACHUSETTS

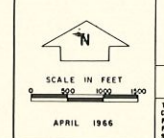
FIG. 9

METCALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALO ALTO

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF COMMUNITY DEVELOPMENT AND WAS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN GENERAL ADMINISTRATION OF THE HOUSING AND HOME FINANCING AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

APRIL 1966

COMPILED BY
PHOTOGRAMMETRIC METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.
STREETS & R.R.'S ARE SHOWN LEGAL WIDTHS



In some communities, 70 or 80 gallons of water per person are used while a decade or so ago the consumption rate was only 50 gpd. per person. To allow for this trend in increased water usage, 120 gpd. per person is used for designing water supplies.

At a consumption rate of 120 gpd. per person, one acre of land in Harwich, on the average, assuming an even density of development over a large area, can provide enough water to support 3.5 persons - the estimated number of persons in the average future Harwich family. Thus, in areas where a public or piped water system is not available, the development density should not be greater than one family per acre or about one family per 40,000 sq. ft.

Sewerage - In the American Society of Civil Engineers publication "A Study of Sewage Collection and Disposal in Fringe Areas" Vol. 84, Paper 1613, 1958, it is recommended that one acre be considered as the minimum lot size in areas dependent upon both on-lot water and sewerage systems. Detailed studies done by Metcalf & Eddy in 1965 for the Southeastern Connecticut Regional Planning Agency on the same subject have revealed that while one acre should be satisfactory in average to well-drained areas, 50,000 sq. ft. is a more desirable minimum in poorly drained areas. These acreages provide sufficient land area to move the leaching field on the lot each 15-20 years during a 40-50 year period and still not contaminate the on-lot water supply. The final size for an individual lot should be determined by detailed soils, ledge, and groundwater investigations.

By comparing Fig. 9, Predominant Lot Sizes, with Fig. 8, General Land Suitability, and applying the minimum lot sizes shown in Table 11, it will be noticed that there are many areas in Harwich serviced by a public water system where the predominant lot size is already too small to support a private on-lot sewerage system. Principal areas are south of Route 28, east and south of Route 39, around inland ponds such as Josephs, Bucks, and Long, and adjacent to Pleasant Bay.

In other areas, such as where dependency is upon both on-lot water and sewerage systems, existing lots are completely inadequate in size to offset the danger of well contamination.

In the area south of Route 28 lots are generally too small in size for service by private drains.

Future Development

The predicted major location of future development areas in Harwich around principally inland ponds are in areas consisting largely of land classified as difficult to develop or not suitable for development (see Fig. 9).

POPULATION

Size

The U. S. Census taken in April, 1960 recorded 3,747 persons living in the Town of Harwich. The State Decennial Census of 1965, also taken in the spring recorded 4,830 persons. Usually, for Massachusetts towns, it is difficult to correlate the federal and state census figures. In Harwich, using available data, such as the number of building permits issued, we find no reason to reject either of these two censuses.

Historic changes in Harwich's year-round population are evident on Fig. 10. The decline in population after 1900 was accelerated by World War I, but the prosperity of the 1920's reversed the trend. The effects of national prosperity were not as strong on Harwich as more urbanized portions of the United States because of transportation time to the Cape in the 1920's. Population growth in Harwich slowed during the depression days of the 1930's, but was beginning to increase more rapidly just before World War II. World War II caused a drastic reduction in population as Cape Codders entered the armed forces or became defense workers in off-Cape factories.

After 1945, year-round population began to grow at a record rate. This post-World War II boom is still continuing. National prosperity and good highway access to the mid-Cape area have caused an average increase of 138 persons per year in the Harwich year-round population since 1945.

Information about past and present seasonal (summer) population is scarce. Neither the federal nor state census covers this type of population. In addition, summer population consists of various components: year-round residents; summer only residents; summer weekend only residents; hotel, motel, cottage and other overnight guests; and day-trippers. For our purposes we have estimated the seasonal peak or weekend and holiday population in Table 12.

Distribution and Density

The estimated 1960 distribution of year-round and summer resident population and 1965 summer peak population is indicated in Table 13. The bulk of the year-round population is living in Harwich Center, West Harwich, Harwichport north of Route 28, and South Harwich. The greatest change between year-round and summer populations occurs near Nantucket Sound, and particularly in Harwichport and West Harwich. The contrast between summer population levels along Nantucket Sound and those farther inland is striking.

Table 12. Seasonal Peak Population

Components	1960	1965 ⁽⁶⁾
Summer residents including rental cottages	10,850 ⁽¹⁾	11,955 ⁽²⁾
Hotel and motel guests ⁽³⁾	1,300	1,661
Other overnight guests ⁽⁴⁾	280	358
Day-trippers ⁽⁵⁾	3,500	4,025
Year-round residents	<u>3,747</u>	<u>4,830</u>
Total	19,677	22,829

1. Estimated by Mass. Dept. of Development and Commerce.
2. Based on 4.25 persons per housing unit.
3. Based on estimates by Blair Assoc.
4. Estimated to be located principally in "guest houses" which are regulated separately by the Harwich Board of Health. Based on 150 rooms and an average of two persons per room with a 75 percent occupancy rate.
5. Estimated to be proportional to year-round residents.
6. Magnitude of 1965 estimates verified by field survey.

Table 13. Year-Round and Summer Population Distribution by Planning District

Planning district ⁽¹⁾	1960 Year-round population ⁽²⁾	1960 Year-round and summer resident population ⁽³⁾	1965 Summer peak population ⁽⁴⁾
15A	280	3,149	5,500
15B	503	1,706	2,500
16A	705	1,768	2,250
16B	715	2,113	4,000
17A	545	3,082	5,000
17B	<u>999</u>	<u>2,780</u>	<u>3,579</u>
Total	3,747	14,598	22,829

1. See Fig. 5 for location of planning districts.
2. Based on unpublished U.S. Census, 1960, with apportionment based on 1966 existing land-use survey.
3. Based on estimates by Mass. Dept. of Commerce and Development, with apportionment based on 1966 existing land-use survey. Does not include hotel, motel, cottage or other overnight guests in rental units or day-trippers.
4. Includes year-round and summer residents, overnight guests of all types and day-trippers.

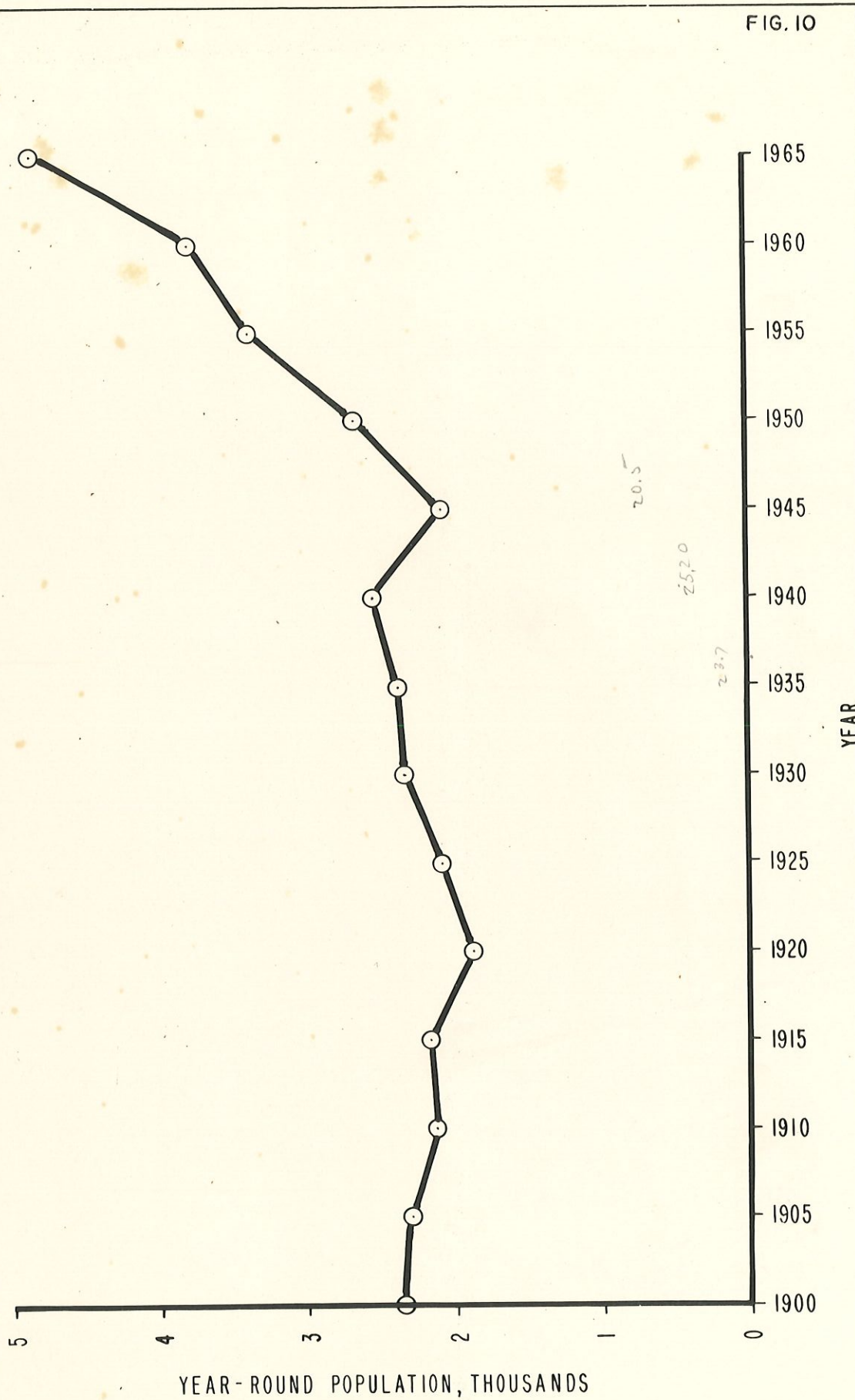


FIG. 10

SOURCES: U.S. Census and Mass. Decennial Census,

MASTER PLAN	TOWN OF HARWICH	MASSACHUSETTS
POPULATION CHANGES SINCE 1900		
THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.		
METCALF & EDDY, INC. • ENGINEERS & PLANNERS • BOSTON · NEW YORK · PALO ALTO		

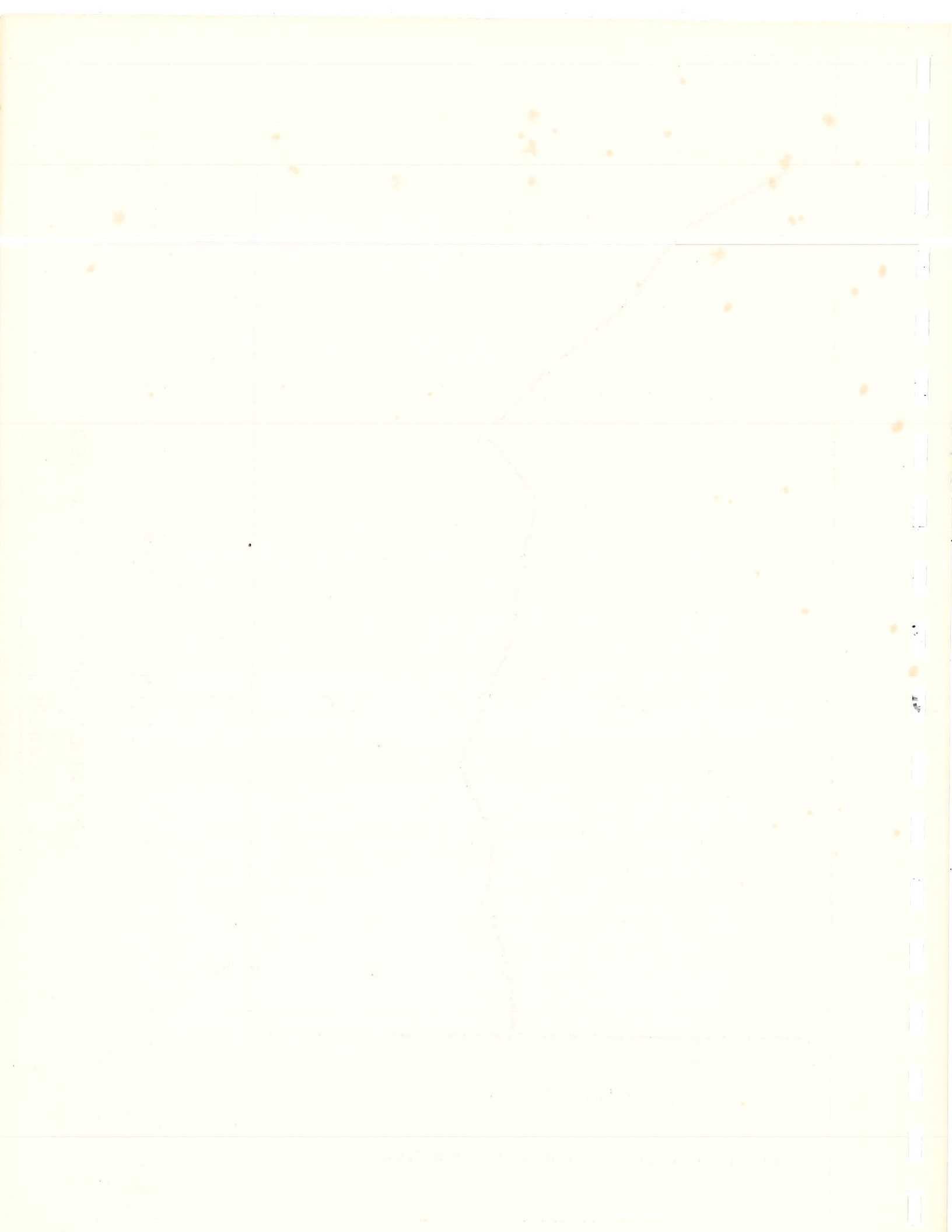


Fig. 11 shows the estimated 1965 year-round, and Fig. 12 the summer peak, population densities in persons per acre. The density maps show clearly the crowding along Nantucket Sound and the comparatively low densities in the inland areas, except around certain fresh water ponds.

Composition

The 1960 age-sex composition of year-round population is shown graphically on Fig. 13, 1,715 persons or 45.8 percent are males and 2,032 persons or 54.2 percent are females.

The significant presence of retired persons is indicated by the bulge in the 65-69 year age group. Of those aged 65 years or over, 57.2 percent are females. The small percentage in the 20-24 year age group is primarily due to the low birth rates prevailing nationally just before World War II. This group is further decreased by those away at college, in the armed forces or migrated to a city for work.

A high and steady birth rate since 1945 is indicated by the large number of children less than 15 years old. There were 1,042 children less than 15 years old in 1960, or 27.8 percent of the total population. The percentage (23.0) of the population in the years of family formation, aged 20 to 44, is exceptionally low compared to other towns in Massachusetts. This is because of the large number of persons aged 45 and over in Harwich.

As shown in Table 14, the most marked increases in population composition between 1950 and 1960 were the percentage increases in the under 5, 5-14, and 65 and over age groups. The most marked decreases percentage-wise during this same period were in the 15-20, 21-34, and 25-34 age groups. Harwich is becoming a town consisting principally of persons at both ends of the age spectrum-preschoolers, teenagers, and retired persons.

Characteristics*

Various population characteristics of Harwich, in comparison with its neighbors, are shown in the following Table 15.

*1950 U.S. Census information regarding population characteristics is not available.

Table 14. Changes in Population Composition

Age group	1950		1960	
	Number	Percent	Number	Percent
Under 5	244	9.2	375	10.0
5-14	358	13.5	667	17.8
15-20	179	6.8	203	5.4
21-24	87	3.3	107	2.9
25-34	323	12.2	322	8.6
35-44	299	11.3	433	11.6
45-54	329	12.4	390	10.4
55-64	335	12.6	469	12.4
65 and over	495	18.7	781	20.9
Total	2,649	100.0	3,747	100.0

Sources: 1950 and 1960 U.S. Census.

Table 15. Compared Population Characteristics

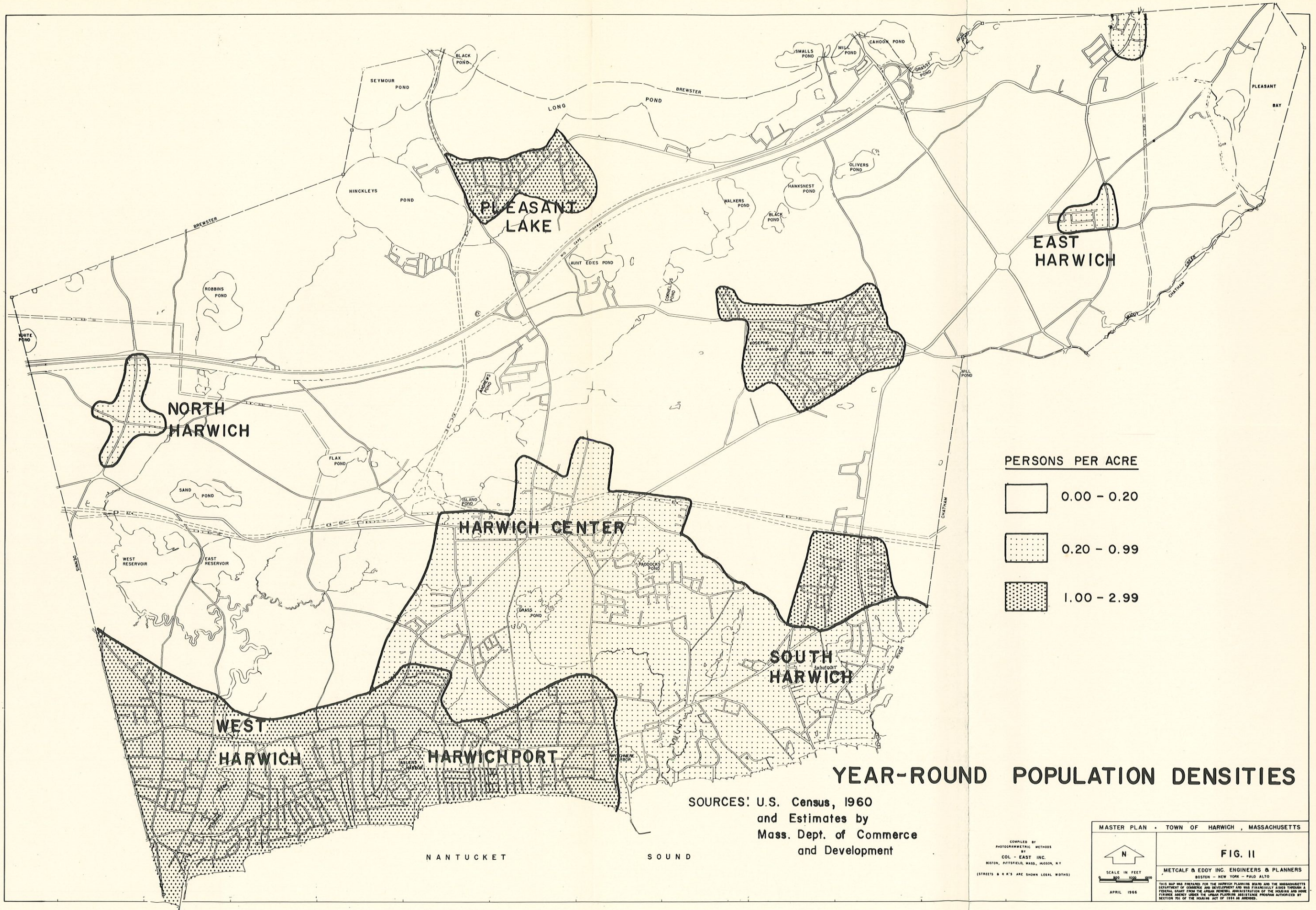
Area	Median family income	Percent foreign stock	Percent persons in families	Median school years completed	Percent live same house 1960 as in 1955
Brewster	\$5,817	27.8	89.8	12.4	53.2
Chatham	5,338	19.8	90.4	12.3	52.3
Dennis	5,119	20.6	91.5	12.2	53.5
Harwich	5,211	25.8	80.7	12.2	47.2
Orleans	5,833	21.1	89.9	12.5	44.4
Cape Cod	5,386	26.2	90.6	12.2	48.3

Source: 1960 U.S. Census.

Harwich appears to have a relatively low median family income, a relatively high percentage of residents whose parents were born outside the United States, a low percentage of persons in families, a low number of median school years completed and a relatively high turnover in housing occupancy.

Only 102 persons or 2.7 percent of Harwich's total population in 1960 were listed as nonwhite. Eighty-three of these nonwhites live in Planning District 16A, East Harwich, east of Pleasant Lake Road and north of Chatham Road (see Fig. 5).

Only a general hypotheses can be made regarding the characteristics of the summer resident families. It is expected they are headed by an above-average income wage



PERSONS PER ACRE

- 0.00 - 0.20
- 0.20 - 0.99
- 1.00 - 2.99

YEAR-ROUND POPULATION DENSITIES

SOURCES: U.S. Census, 1960
and Estimates by
Mass. Dept. of Commerce
and Development

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS

FIG. II

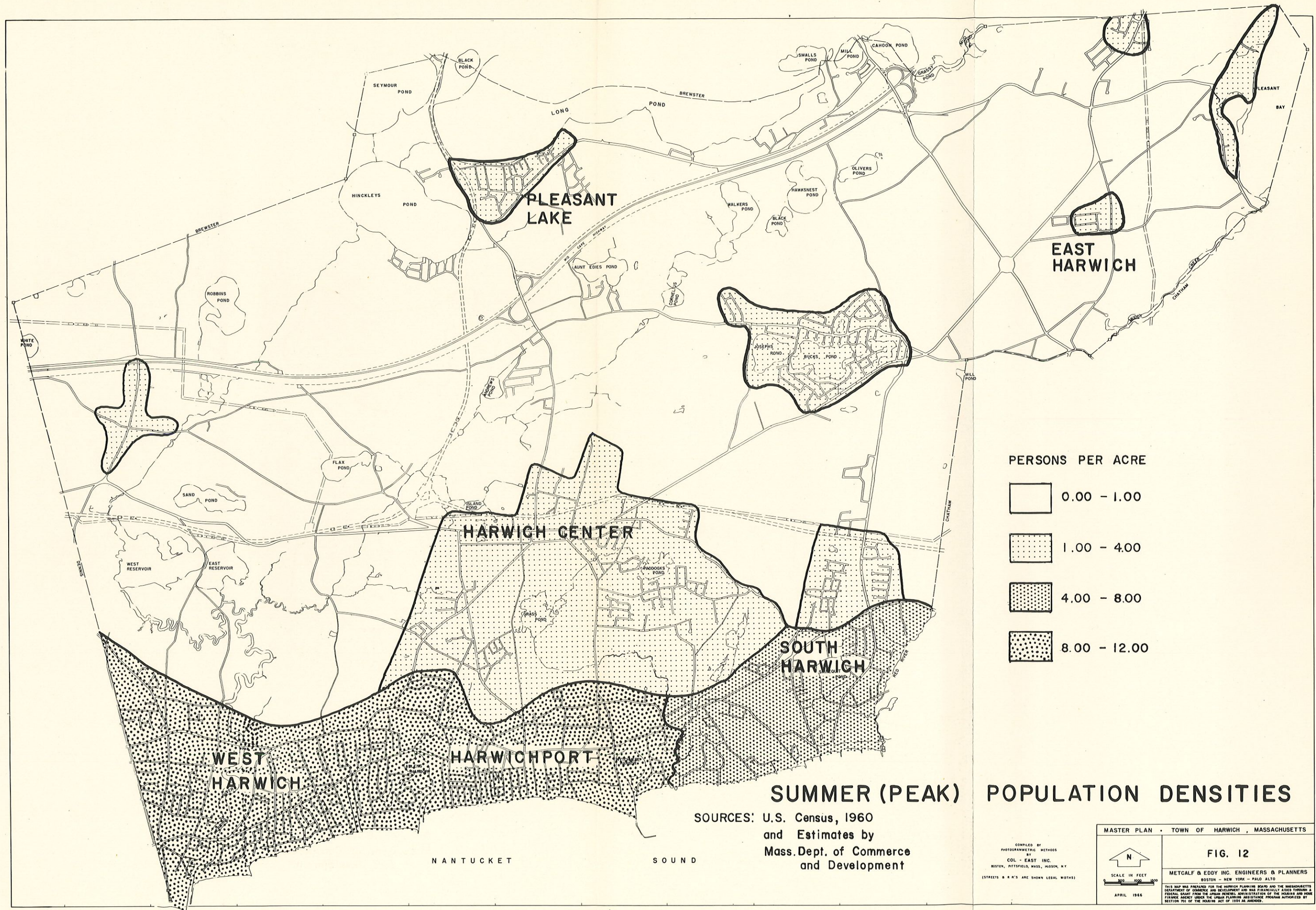
METCALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALO ALTO

COMPILED BY
PHOTODUPLICATION METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.
(STREETS & R.T.'S ARE SHOWN LEGAL WIDTHS)





SCALE IN FEET
0 500 1000

APRIL 1966

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD UNDER THE MASSACHUSETTS DEPARTMENT OF COMMERCE AND DEVELOPMENT AND WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN HOUSING ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.



PERSONS PER ACRE

-  0.00 - 1.00
-  1.00 - 4.00
-  4.00 - 8.00
-  8.00 - 12.00

SUMMER (PEAK) POPULATION DENSITIES

SOURCES: U.S. Census, 1960
and Estimates by
Mass. Dept. of Commerce
and Development

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS

N

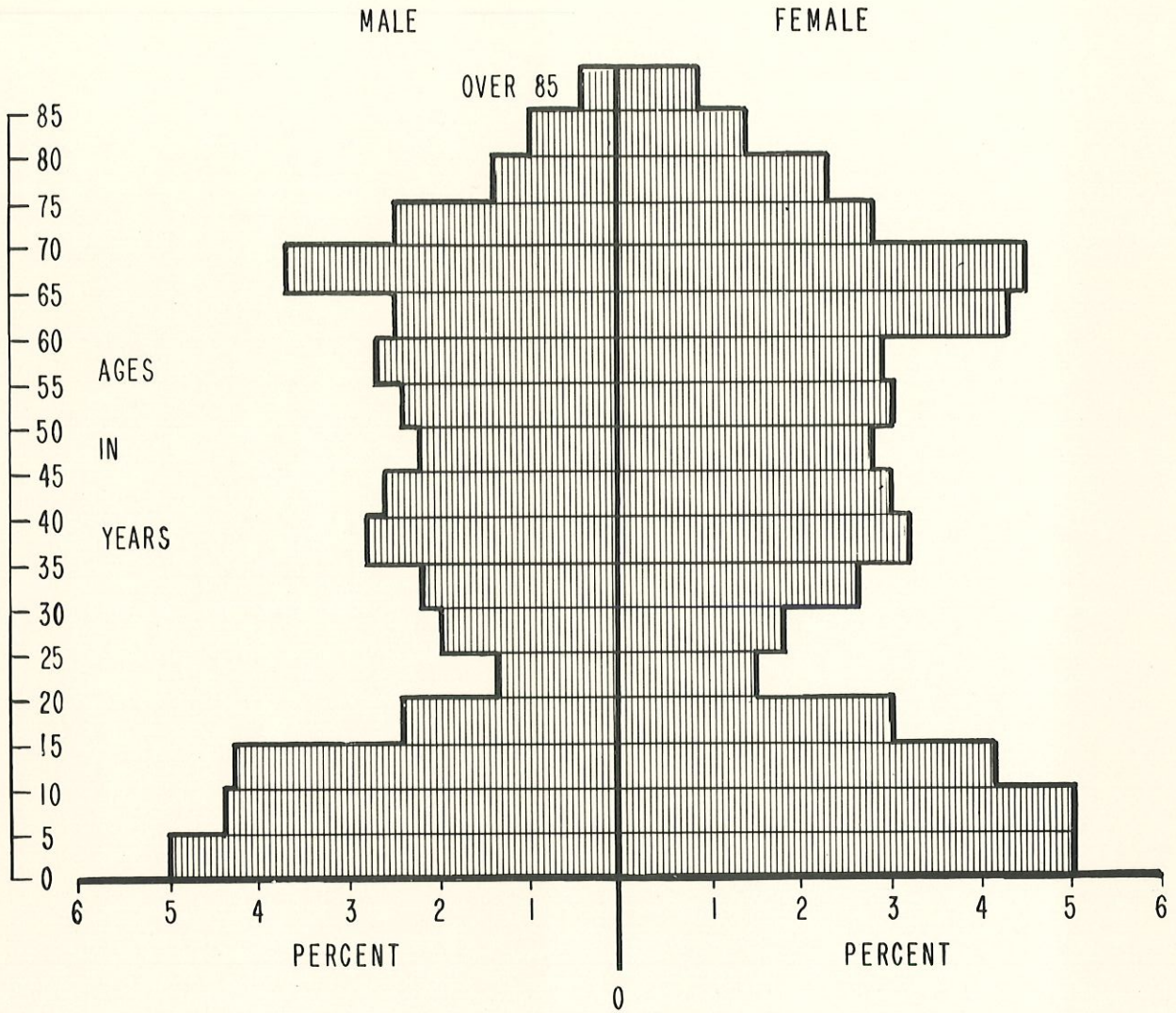
SCALE IN FEET
0 500 1000 1500

APRIL 1966

FIG. 12

METCALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALO ALTO

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF COMMERCE AND DEVELOPMENT AND WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN REDEVELOPMENT ADMINISTRATION OF THE HOUSING AND URBAN FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.



Total Population : 3747
 Source : U.S. Census , 1960

MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

AGE-SEX COMPOSITION OF YEAR-ROUND POPULATION

METCALF & BERRY, INC. • ENGINEERS & PLANNERS • BOSTON • NEW YORK • PALO ALTO

earner, usually above 35 years old and one that spends only summer weekends in Harwich. We suspect further that the average age of the children of the summer resident families is higher than that of the year-round resident families. However, an unusual phenomenon is observed. In many cases the second generation or grandchildren will offset an emphasis on the older children of other summer resident families. Also many of the older year-round resident families are visited in the summer by their children and grandchildren.

Overnight guests in hotels, motels, cottages, and other accommodations are attracted from all over the United States to Harwich. No general hypotheses can be made regarding their characteristics, other than they have above average incomes.

Components of Change

The population of any geographical area changes because of two factors: one, natural increase or decrease, i.e., the difference between births and deaths, and two, the difference between in- and out-migration.

Natural increase and decrease for the period 1955 through 1964 are shown in Table 16.

Table 16. Natural Increase and Decrease

Year	Allocated births	Allocated deaths	Natural increase or decrease
1955	84	52	+32
1956	71	60	+11
1957	87	54	+33
1958	89	84	+5
1959	69	72	-3
1960	72	69	+3
1961	84	71	+13
1962	73	79	-6
1963	90	94	-4
1964	70	58	+12

Source: Secretary of State, Annual Report.

A downward trend will be noticed in natural increase and for several of the later years even a decrease is shown. Since during this same period of time the town grew in population size, it is evident that the cause of town growth is in-migration.

Because of the approximate doubling in number of individuals aged 65 years and over between 1950 and 1960 (not accounted for by those aged 55-64 years in 1950), the increase in deaths (most apt to occur in ages 65 and over) between these two years, and a corresponding decrease in births during the same period, it is concluded that the principal in-migrants are retired persons, or those aged 65 and over.

Future Year-Round Size and Composition

The forecasting year-round population is based on a continuance of present growth from an in-migration by the older age groups. The age composition trend between 1950 and 1960 was projected through 1980.

The resultant year-round population forecasts for 1970, 1975, and 1980 are shown on Fig. 14.

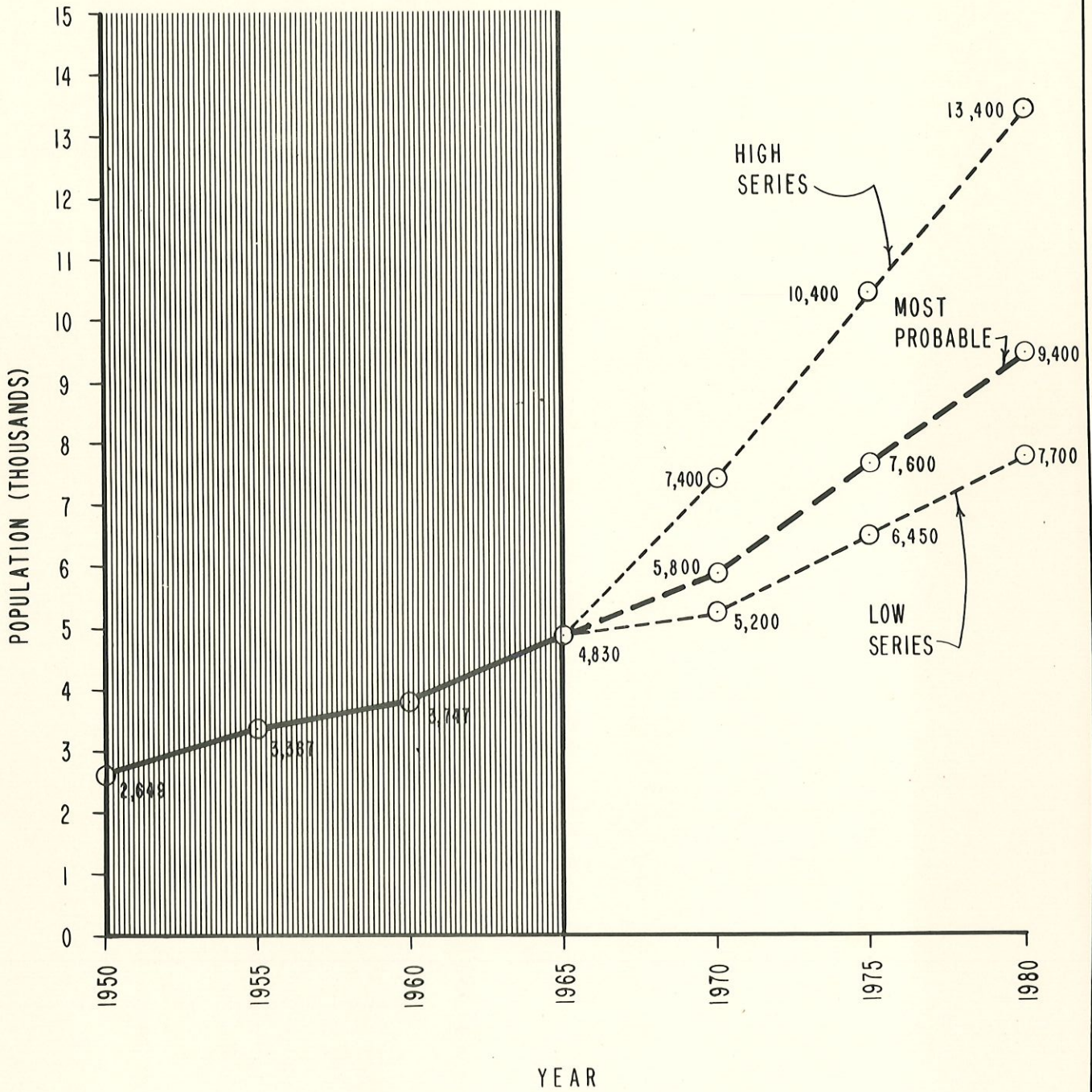
The age composition forecasts for 1970 and 1980 are presented in Table 17.

Table 17. Future Year-Round Age Population Composition

Age groups	1970		1980	
	Number	Percent	Number	Percent
Under 5	438	7.5	684	7.3
5-14	943	16.2	1,344	14.3
15-20	354	6.1	533	5.7
21-24	259	4.5	529	5.6
25-34	470	8.1	750	8.0
35-44	555	9.6	829	8.8
45-54	658	11.3	1,062	11.3
55-64	760	13.1	1,248	13.3
65 and over	<u>1,363</u>	<u>23.6</u>	<u>2,421</u>	<u>25.7</u>
Total	5,800	100.0	9,400	100.0

Source: Forecasts by Metcalf & Eddy, Inc.

FIG. 14



SOURCES: U.S. Census, Mass. Dept. of Commerce & Development;
Forecasts by Metcalf & Eddy, Inc.

MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

FUTURE
YEAR-ROUND POPULATION

METCALF & EDDY, INC. • ENGINEERS & PLANNERS • BOSTON • NEW YORK • PALO ALTO

Future Peak Summer Size

Two conflicting forces are acting on the rate of increase in summer resident population. Desirable vacant land near the ocean is becoming scarce and expensive. This would tend to slow the growth of the summer resident population. On the other hand, the national economy is growing and more and more people are finding that they can afford a second home. Considering these two factors, it is our judgment that the best projection through 1980 for this component of the summer population is still one of constant growth based on the present rate of new added summer resident housing of about 52 units per year. At 4.25 persons per unit this results in an average yearly increase of 220 persons in summer peak population. The Blair Report estimated an increase of 111.1 percent between 1960 and 1980 in overnight guests of all types on Cape Cod. Our forecast for such guests is based on Harwich receiving its share of such increase. The future number of day-trippers is assumed to be in the same proportion to year-round and summer residents as it was in 1960.

The future peak summer population for the years 1970, 1975, and 1980 are shown in Table 18.

Table 18. Future Peak Summer Population

Components of population	Year		
	1970	1975	1980
Summer residents including rental cottages	13,060	14,165	15,270
Hotels and motel guests	2,022	2,383	2,744
Other overnight guests	435	513	591
Day-trippers	4,522	5,219	5,915
Year-round residents	<u>5,800</u>	<u>7,600</u>	<u>9,400</u>
Total	25,839	29,880	33,920

Source: Forecast by Metcalf & Eddy, Inc.

Future Development

Based on the above population forecasts, it is estimated that by 1980 Harwich will need the full range of community facilities (schools, recreation and conservation, and public buildings and lands) and public utilities (sewerage and water) usually found in an urban municipality.

HOUSING

Quantities

The history of Harwich's housing inventory, based on various sources, is presented in Table 19. These figures suggest an increasing importance of summer residences including cottages. The table indicates that the number of seasonal residences has increased 239 percent since 1940, while the number of year-round residences has increased only 57 percent. Of all housing units in Harwich in 1960, 64.2 percent were summer residences. The distribution by planning district is shown in Table 20.

Table 20. Total Housing Units and Summer Residences
by Planning District

Planning district*	Total housing units	Summer residences	Summer residences as percent of housing units
15A	789	665	84.3
15B	498	265	53.2
16A	476	219	46.0
16B	582	323	55.5
17A	773	583	75.4
17B	<u>715</u>	<u>406</u>	<u>56.8</u>
Total	3,833	2,461	64.2

*See Fig. 5 for location of Planning Districts.

Source: Unpublished data, U.S. Census, 1960.

Another section of the housing supply is the lodging business. A 1962 field count by the Massachusetts Department of Commerce and Development tallied 19 motels containing 324 rooms, and 10 hotels containing 321 rooms. Building permits were issued for one motel in 1963, three in 1964, and one in 1965. It is estimated that in 1966 there were 400 motel rooms and 321 hotel rooms.

Guest houses are an unknown quantity. As far as we know, no field count of these facilities has ever been made. There are serious problems of identification and definition, so that such a survey would be quite time consuming. However, the town does issue operating permits for guest houses. According to town reports, the number of issued guest house permits declined from a maximum of 58 in 1958 to a low of 33 in 1965.

Table 19. Change in Housing Units by Planning District

Planning district (1)	Number of housing units									
	Year-round			Seasonal			Total			
	1940	1950	1960	1940	1950	1960	1940	1950	1960	1960
15A	80	85	124	211	354	665	291	439	789	
15B	129	140	233	164	126	265	293	266	498	
16A	146	154	257	43	155	219	189	309	476	
16B	153	165	259	56	145	323	209	310	582	
17A	133	136	190	178	163	583	311	299	773	
17B	233	233	309	74	290	406	307	523	715	
Total	874	913	1,372	726	1,233	2,461	1,600	2,146	3,833	

1. See Fig. 5 for location of planning districts.

- Source:
1. Mass. Dept. of Public Works, 1938 General Highway Map.
 2. USGS 7-1/2-minute Harwich Quadrangle, 1949.
 3. U.S. Census, 1960.

A field check of the Harwich operating permit counts indicate that they understate the number of establishments by at least 50 percent. A reasonable estimate of guest houses is that there are about 50 guest houses, averaging three rooms each.

Types

Table 21 presents the 1960 census count of residential structures by number of units. The number of three- and four-family structures (apartments) is surprising. These were not noted during the 1966 land use survey. Apparently, residences which have seasonal rental apartments make up the bulk of this classification. These cannot be identified without an interior investigation.

Table 21. Housing Units and Structures by Type

Type	Housing units	Structures
Single family	2,994	2,994
Two family	26	13
Three- and four-family	81(1)	216(1)
Five- to nine-family	11(1)	2(1)
Ten-family or more	21(1)	2(1)
Total	3,833	3,227

1. Not substantiated by Metcalf & Eddy, Inc. Field Survey, 1966.

Source: U.S. Census, 1960.

Characteristics

Various characteristics of housing in Harwich and neighboring towns is shown in Table 22.

Table 22. Compared Housing Characteristics

Area	Median value-owner occupied unit	Median persons occupied unit
Brewster	\$13,993	2.4
Chatham	13,860	2.4
Dennis	13,404	2.4
Harwich	12,076	2.3
Orleans	14,233	2.2
Cape Cod	12,700	2.7

Source: U.S. Census, 1960.

In comparison with its neighbors, Harwich has the lowest median value per occupied dwelling unit and the second lowest median number of persons per occupied unit. As discussed previously in the population chapter, this could connote a higher emphasis on retired persons living in Harwich than in the other towns.

Future Development

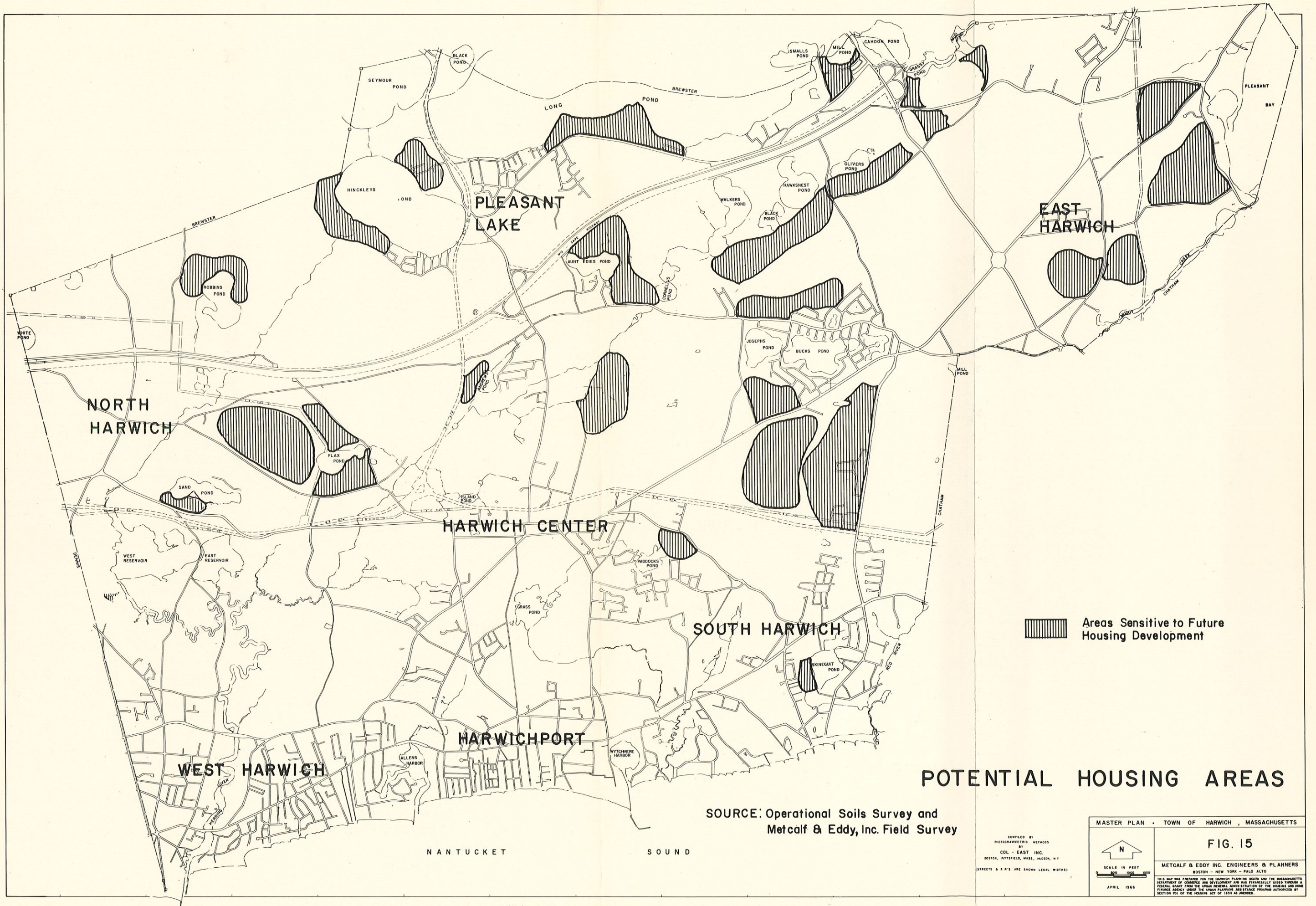
To house the estimated 1980 population, both year-round and seasonal residents, about 3,000 more housing units would be needed. Of these, about 1,000 should be seasonal residences and the remaining 2,000, year-round residences. The above would reduce the ratio of existing seasonal residences to all existing residences from the figure of 64.2 percent in 1960 to about 50 percent in 1980.

Where and how much land will be needed for these new housing units? First, it is estimated that about 1,000 new units, both year-round and seasonal, will be added in Harwich Center, Harwichport, and West Harwich, increasing the population density in these places, but hardly affecting the major available supply of vacant land.

The other 2,000 new units, both year-round and seasonal, will require some portion of the approximately 8,000 acres of vacant land usable for residential development. This makes possible a residential density which would be unusually low in many locations, but which makes good sense in Harwich in view of the importance of preserving and enhancing the natural and indigenous elements of the environment. The typical subdivisions of the next 15 years could have one-half acre lots and an open-space area in the amount of one-half acre for each lot in the subdivision. Street rights-of-way would require another 1/10 acre per house lot, which is negligible. The land use need for these 2,000 housing units, if present subdivision practices continue, would be about 700 acres. If the above low-density standard is adopted, the land use need would be about 2,000 acres.

It is also possible that a larger portion of the housing demand, particularly the summer rental market, could be satisfied by motels, hotels, and other types of apartments. A location where there was a view of the salt-water would be ideal, and the general location for these units should be south of Route 28. If about 300 units of this type were projected, the requirements for the remaining 1,700 units listed above would be reduced to about 600 acres at existing subdivision densities, or 1,400 acres at the suggested new low densities.

Areas sensitive to future housing development are shown on Fig. 15.



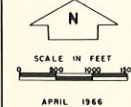
POTENTIAL HOUSING AREAS

SOURCE: Operational Soils Survey and Metcalf & Eddy, Inc. Field Survey

 Areas Sensitive to Future Housing Development

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS	
FIG. 15	
METCALF & EDDY INC. ENGINEERS & PLANNERS BOSTON - NEW YORK - PALO ALTO	
<p style="font-size: small;">THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF CONSERVATION AND DEVELOPMENT AND WAS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN HOUSING ADMINISTRATION OF THE HOUSING AND URBAN FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.</p>	

COPILED BY
 PHOTODUPLICATION METHODS
 BY
 COL - EAST INC.
 BOSTON, PITTSFIELD, MASS., HOUSTON, TX
 STREETS & R.W.'S ARE SHOWN LEGAL WIDTHS
 APRIL 1966



NANTUCKET SOUND

ECONOMY

Resident Labor Force

In April 1960, Harwich had a resident labor force of 1,299 persons, 867 men and 432 women. As shown in Table 23, in comparison with its five neighbors and the county, Harwich ranked third in both male and female labor participation. These relatively low labor force participation percentages are reflected in part by the high percentage of year-round Cape Cod residents who are retired. Also, it is expected that there are many persons in Harwich, as well as throughout Cape Cod, who are not in the labor force in the winter, but do work during the summer months.

Table 23. Compared Labor Force Participation*

Area	Percent males 14 years old and over in labor force	Percent females 14 years old and over in labor force
Brewster	68.0	32.7
Chatham	72.3	27.3
Dennis	69.9	25.0
Harwich	72.0	27.8
Orleans	76.6	35.2
Cape Cod	78.7	30.0

*As of April 1960.

Source: U.S. Census, 1960.

Year-Round Employment

Between 1950 and 1960 year-round employment increased from 352 to 540 persons. By 1964 it had risen to 632. Year-round employment increases since 1950 have, therefore, kept pace with year-round population increases.

As shown in Table 24, the principal increases in year-round employment since 1950 have been in manufacturing; retail trade; finance, insurance and real estate; and service trade.

Table 24. Changes in Year-Round Employment*

Economic sector	Year**			
	1950	1960	1964	1965
Agriculture, forestry and fisheries	14	18	12	19
Construction	114	122	133	127
Manufacturing	23	85	94	80
Transportation, communications, and utilities	9	17	18	17
Wholesale and retail trade	89	154	163	168
Finance, insurance, and real estate	33	69	64	66
Service trade	<u>70</u>	<u>75</u>	<u>148</u>	<u>140</u>
Total	352	540	632	617

*Employees covered by unemployment insurance. Virtually all manufacturing jobs are covered. The majority of nonmanufacturing jobs are covered with the major exception being employment in nonprofit activities, and self-employment.

** Year-round as of November of each year.

Source: Mass. Dept. of Employment Security.

Seasonal Employment

As shown on Fig. 16, seasonal employment in both Harwich and Cape Cod changed significantly between 1950 and 1964. In general, it has kept pace with increases in seasonal population. Table 25 shows that "Wholesale and Trade" and "Service Trade" account for most of the local employment and are subject to severe seasonal variations. In 1964, the number of employees in these two industrial groups was reduced by 842 between August and November.

Fortunately, in 1964, manufacturing took up a little of the winter employment slack, with an increase of 62 jobs between summer and winter.

Table 25. Changes Between Seasonal and Year-Round Employment by Economic Sector

Economic sector	Seasonal** 1964		Year-round** 1964		Change in number of employees *
	Number	Percent	Number	Percent	
Agriculture, forestry, and fisheries	23	1.7	12	1.9	-11
Construction	147	10.2	133	21.0	-14
Manufacturing	32	2.3	94	14.9	+62
Transportation, communications, and utilities	24	1.7	18	2.9	-6
Wholesale and retail trade	497	34.6	163	25.8	-334
Finance, insurance, and real estate	56	3.9	64	10.1	+8
Service trade	<u>656</u>	<u>45.6</u>	<u>148</u>	<u>23.4</u>	<u>-508</u>
Total	1,435	100.0	632	100.0	-803

*Employees covered by employment insurance.

**Seasonal as of August and year-round as of November.

Source: Mass. Dept. of Employment Security.

Commuting

There are almost no data available on commuting into or out of Harwich. We know that some persons in Harwich in September 1960 were commuting outside of Harwich to manufacturing jobs in other towns on Cape Cod.* This information is based on a mail survey and the significance of the above statistic for Harwich cannot be determined.

The U.S. Census, 1960, included a place-of-work question, but places smaller than counties, cities, and metropolitan areas were not included. The 1960 census indicated that at least 95 percent of those reporting a place of work were working in Harwich and Barnstable county. The place of work of the other 5 percent is not specified.

*Mass. Dept. of Commerce, Division of Planning, Manufacturing Commuting Survey, Coastal Plan.

Based on an evaluation of the relationship between resident labor force, covered employment and other data, it is estimated that approximately 40 percent of the Harwich resident labor force or approximately 500 persons during the winter work outside of Harwich.

Livelihood

Some information is available, mostly from unpublished data from the 1960 U.S. Census, regarding the income and skills of the Harwich labor force. As shown in Table 26 and Table 27, in comparison with its neighbors and Cape Cod, Harwich year-round residents have the lowest median income for families and unrelated individuals; the second lowest for median family income only; the second lowest percentage of its male labor force employed as professional, technical, and kindred workers; the second highest (tied with Cape Cod) percentage as managers, officials, and proprietors, except farm; the lowest percentage as craftsmen, foremen and kindred; and the second highest percentage as laborers, except farm.

Table 26. Compared Income of the Year-Round Resident

Area	Median income - families and unrelated individuals	Median family income
Brewster	\$5,123	\$5,817
Chatham	4,586	5,338
Dennis	4,476	5,119
Harwich	4,156	5,211
Orleans	5,061	5,833
Cape Cod	4,382	5,386

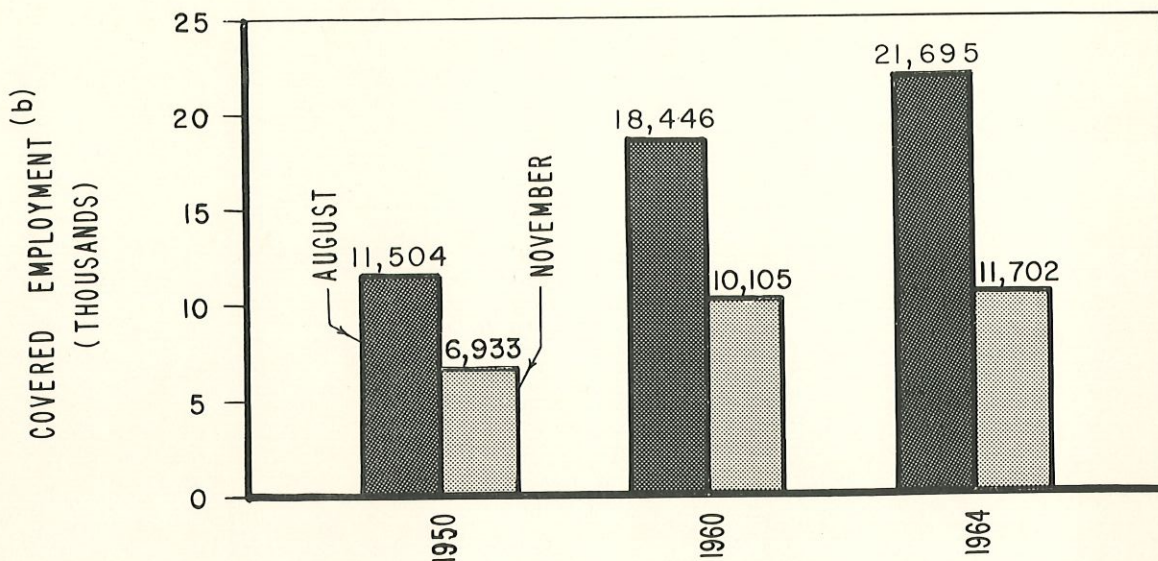
Source: U.S. Census, 1960.

Table 27. Percent of Male Labor Force in Selected Occupations

Area	Professional, technical, and kindred	Managers, officials, proprietors, except farm	Craftsmen foremen & kindred	Laborers, except farm and mine
Brewster	22.1	9.4	28.8	6.2
Chatham	8.2	11.0	27.6	20.2
Dennis	7.2	16.6	37.2	5.2
Harwich	7.7	14.9	26.4	13.1
Orleans	16.2	13.5	29.3	10.6
Cape Cod	8.9	14.9	26.5	10.1

Source: U.S. Census, 1960.

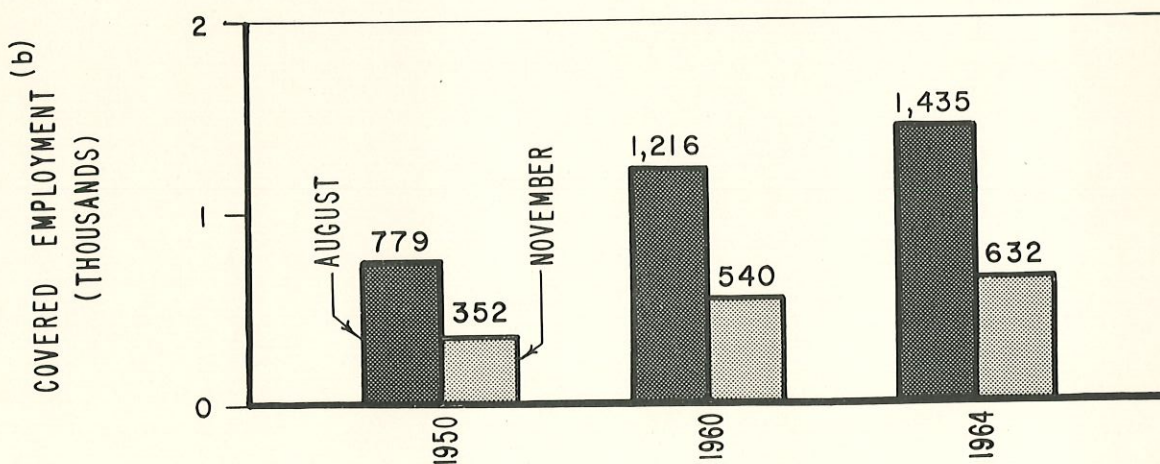
SEASONAL EMPLOYMENT ON CAPE COD (a)



(a) SOURCE: Mass. Div. of Employment Security.

(b) Employees covered by unemployment insurance.

SEASONAL EMPLOYMENT IN HARWICH (a)



(a) SOURCE: Mass. Div. of Employment Security.

(b) Employees covered by unemployment insurance.

MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

CHANGES IN SEASONAL EMPLOYMENT

METCALF & EDDY, INC. ENGINEERS & PLANNERS BOSTON NEW YORK PALO ALTO

Many Harwich year-round residents argue that they are not realizing any significant degree of prosperity from Harwich's resort industry and that they would be better off without emphasis on it.

A comparison of selected statistics for Dennis and Harwich also indicates that the average income level of the year-round residents is independent of the size of the resort industry. Dennis, with 880 motel and hotel units in 1962, had a median family income in 1959 of \$5,119. Harwich, with 645 motel and hotel units in 1962, had a median family income in 1959 of \$5,211. Harwich and Dennis have practically the same year-round population. The adjoining towns with the least amount of emphasis on resort industry in terms of motels and hotels, namely Brewster and Orleans, have the highest median family income for year-round residents. It appears that the income level of year-round Harwich residents is not directly related to the size of the Harwich resort industry.

It is estimated that over 50 percent of the resort businesses (hotels, motels, restaurants and cottages) are owned and operated by persons who are not year-round Harwich residents. In addition, many of the summer jobs in the resort industry in Harwich are taken by nonresidents. Resort jobs are usually low-paying, so this work would not be particularly attractive to regularly employed year-round residents.

There is no information available to assess the economic status of the summer residents in relation to the resort industry. As a working hypothesis, we suspect that most of the summer residents are simply vacationing, with no economic interest in the local resort industry.

On the other hand, some of the summer employees of the resort industry, or catering to it, probably rent cottages, thereby becoming summer residents with income derived from the resort industry. The property owners receiving these rents also benefit economically from the presence of the resort industry. However, if the motels and hotels and restaurants and their summer help were not present, it is likely that the property owners could still rent their cottages.

It may well be that the persons who are summer residents because they derive some economic benefit from the resort business, e.g., persons who operate gift shops, guest houses, or motels, are major contributors to the local economy. This may in fact be the point of most

important linkage between the resort industry and the local economy. If the resort industry is supporting a considerable number of summer residents, who are contributing to the local economy by purchasing and maintaining substantial local properties, then the development of the resort industry becomes more important to the residents of Harwich. It can be questioned, however, whether the properties purchased and maintained by these particular summer residents would not be purchased and maintained by others if the resort industry linkage did not exist. The demand for summer homes in Harwich exceeds the supply.

Retired Persons

In the year-round population we have the retired persons who have come to the Cape to live. The importance of this group is indicated by the large number of persons in the over 65 age group. Retired persons are a "basic industry" for Harwich, since their money comes from "off-Cape" and it is spent locally. The census figures indicate that about 100 men and 200 women were in the retired classification in Harwich in 1960. In Harwich, 13.8 percent of the present taxable property in Harwich is owned by retired year-round residents of Harwich.

Economic Sectors

In its early days, Harwich was a whaling and ship-building center, but in the 19th century cod-fishing largely supplanted whaling. Today, fishing has declined and been supplanted by principally seasonal retail and service trades and year-round construction.

Changes in number of firms, i.e., business establishments, for both Harwich and Cape Cod between 1950 and 1964 are shown in Table 28. A comparison in payroll per firm for Harwich and Cape Cod during the same period also is shown in Table 28.

Table 28. Firms and Payroll per Firm by Economic Sector

Economic sector	Harwich Number of firms			Harwich percent change 1950-64	Cape Cod percent change 1950-64
	1950	1960	1964		
Agriculture and fisheries	3	7	10	+233	-85
Construction	29	36	36	+24	+65
Manufacturing	5	5	8	+60	+41
Transportation, communications, and utilities	5	5	8	+60	+75
Retail and wholesale	36	64	56	+56	+60
Finance, insurance, and real estate	4	9	12	+200	+80
Service	23	39	53	+130	+124

Source: Mass. Dept. of Employment Security.

Economic sector	Harwich payroll per firm (in \$000)			Cape Cod payroll per firm (in \$000)		
	1950	1960	1964	1950	1960	1964
Agriculture and fisheries	6	8	4	12	11	13
Construction	11	14	16	13	25	21
Manufacturing	13	25	23	21	41	46
Transportation, communications, and utilities	4	7	8	46	47	69
Retail and wholesale	7	10	14	10	16	21
Finance, insurance, and real estate	20	30	26	9	17	22
Service	12	13	18	9	11	14

Source: Mass. Dept. of Employment Security.

In comparison with Cape Cod, in changes in number of firms, Harwich is particularly high in agriculture and fisheries, and finance, insurance, and real estate; and particularly low in construction. In terms of payroll per firm in 1964, Harwich, in comparison with Cape Cod, is low in all sectors, except finance, insurance and real estate, and services. Harwich is particularly low in manufacturing; transportation, communications, and utilities; and retail and wholesale trade.

Economic Base

Economic base theory holds that the health of a local economy is related to the ratio of "basic" jobs to "nonbasic" (or service) jobs. "Basic" jobs or activities are defined as those which bring money in from outside the town, including those which export goods to customers or labor to employers; and those which sell goods or services to customers from outside the town. "Nonbasic" or "service" jobs are activities which simply circulate money within the town. The implication of this theory is that increasing the basic activities will stimulate increased service employment, thus contributing to a general local growth and prosperity. Theoretically, the higher the ratio of basic to nonbasic jobs, the more prosperous is the town. A 2 to 1 ratio is a desirable goal.

During the summer Harwich's ratio of basic to nonbasic jobs (2.62) is very high. However, during the winter the ratio is only 0.61.

The number of jobs in nonbasic activities remains about the same, winter and summer. The big change is in basic activities. The dominant basic industry is the resort industry, represented by the 842 summer jobs in wholesale and retail trade and miscellaneous services.

Economic Potential

Harwich's economic structure is a response to location, resources, and population growth. However, it is possible that deliberate local efforts can influence this economic structure to the benefit of the Harwich residents.

As the local population increases, more year-round jobs will be required. If these are not supplied locally, the present amount of commuting must increase. Some commuting is a healthy thing for the local economy, but the same jobs furnished locally would be of greater benefit to the local economy.

Manufacturing in Harwich lacks any advantages of nearness to market, large labor supply, or low transportation costs. The best basis for manufacturing in Harwich is the processing of locally produced raw materials. The cranberry cannery and the ice plant exist for this reason. Boat building, of a type in competition with big mainland boat yards, seems unlikely to succeed because of transportation costs. However, there is always a chance that a specialty item like a "Harwich Dinghy" could become popular enough to support a small local boat yard. Boat repair work can, of course, be competitive. Potential manufacturing sites are limited (see Fig. 17). Limited amounts of water are available, but there are no public sewerage facilities and the present zoning by-law does not encourage the development of manufacturing.

For local-year-round employment, perhaps the best opportunity for Harwich is a space-using, locationally free institutional use. The establishments which best fit this description are the educational institutions. In particular, a music school, a preparatory school, small college, or an arts and crafts school are possibilities (see Fig. 17).

Extremely advanced research might be possible in a location remote from library or specialized facilities. However, this would not be a high-employment activity.

Year-round commercial potential is based principally on population growth. Seasonal commercial potential is based on a combination of actions by both the town and private interests.

Encouragement of motel development through zoning could increase this commercial base. At the same time, the setting of increased lot size, setback and parking requirements along Route 28 also could decrease the future seasonal commercial base. Potential locations for commercial sites also are shown on Fig. 17.

The clearing up of property title problems in the northern portion of the town would increase its potential use for all types of economic activities.

Retired persons in Harwich represent a relatively untapped resource for use as a labor force. Many retirement communities in Florida are attempting to attract small arts and crafts industries employing large percentages of retired persons. Harwich could encourage this economic activity through proper promotional efforts.

Forecast of Future Labor Force and Employment

Based on present trends, by 1980 Harwich should have a labor force of 3,000-3,500 persons. This assumes a higher percentage of retired persons in the population and, hence, a lower ratio of labor force to population.

During the same period, the year-round employment in Harwich should increase to 1,200-1,500 persons. The high figure assumes encouragement to manufacturing through water and sewerage improvements and zoning, obtainment of a small private institution such as a private school, a continuance of the present rate of annual construction, and a drop off in the percentage of those living in Harwich who work elsewhere. The lower range assumes no particular encouragement to manufacturing, no obtainment of any private institution, a drop off in the annual rate of construction, and a continuance of the present percentage of those living in Harwich who work elsewhere. The actual employment figure should fall somewhere between the high and low range.

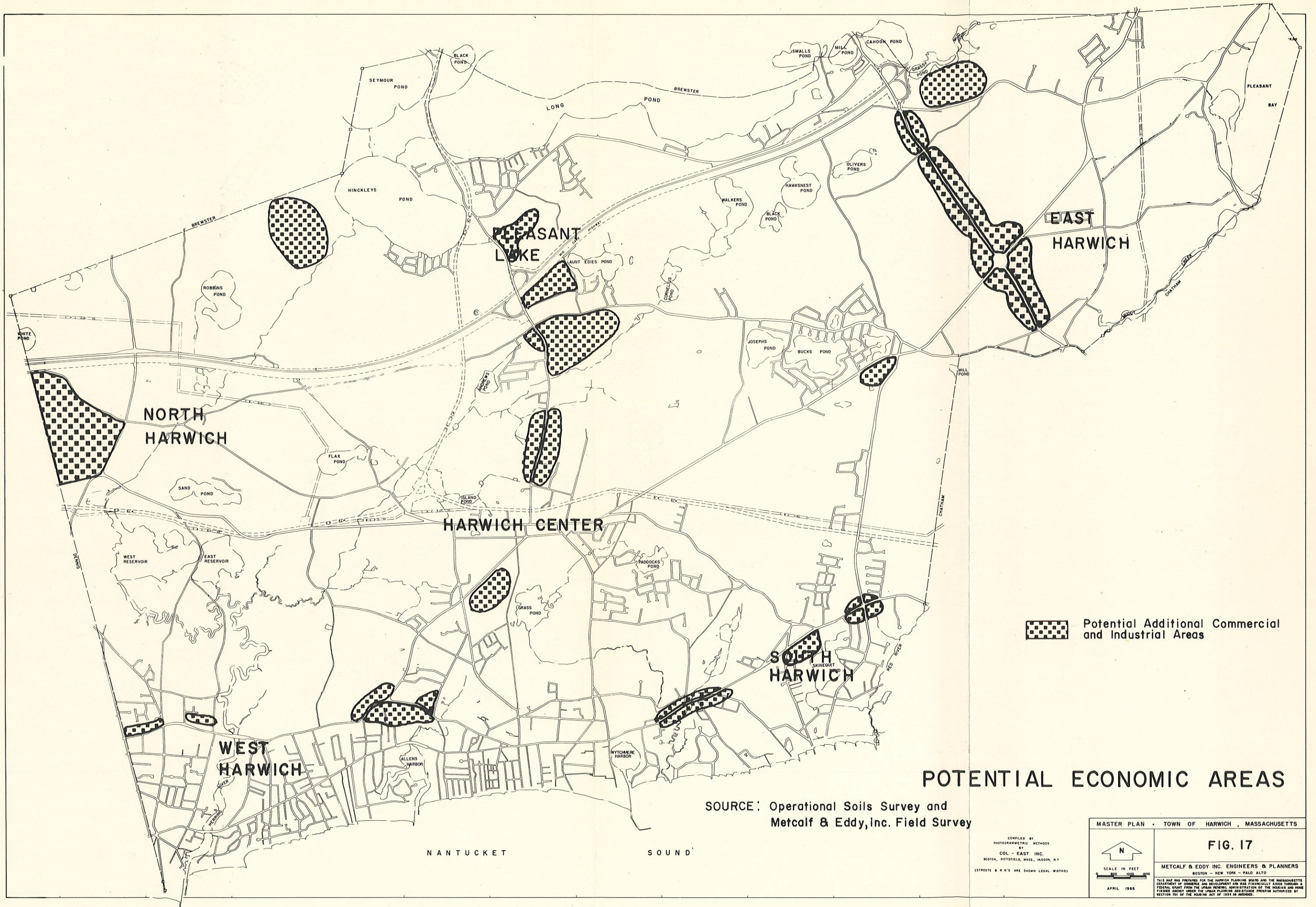
By 1980, the seasonal employment should increase to 2,000 to 2,500 persons. The high range is based on the encouragement and the low range on the discouragement of seasonal commercial activities.

Future Development

Based on existing uses, present trends, land suitability, availability of public water and sewerage service, highway accessibility, and location of vacant land, it is predicted that by 1980 there will be 250-300 acres of commercial land (retail and service and lodging) and 250-400 acres of industrial and kindred (not including institutional uses).

The lower commercial figure is based on the discouragement and the higher on the encouragement of the resort industry.* The same is true for the lower and higher figures for industry.



*See chapter on Economic Development in Part III of this report.



 Potential Additional Commercial and Industrial Areas

POTENTIAL ECONOMIC AREAS

SOURCE: Operational Soils Survey and Metcalf & Eddy, Inc. Field Survey

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS	
 SCALE IN FEET  APRIL 1966	FIG. 17 METCALF & EDDY INC. ENGINEERS & PLANNERS BOSTON - NEW YORK - PALO ALTO <small>THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF COMMERCE AND DEVELOPMENT AND WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN REDEVELOPMENT ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.</small>

COMPILED BY
PHOTOGRAMMETRIC METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., MOSON, N.Y.
(STREETS & R. R.'S ARE SHOWN LEGAL WIDTHS)

PLANNING DISTRICT ANALYSIS

Delineation of Planning District Areas and Boundaries

For the purposes of this Planning District Analysis, the most satisfactory planning district areas and boundaries are the U.S. Census "split-out" areas or enumeration districts for which the unpublished census data are available. These delineated districts meet the tests of reasonable social grouping and similarity in land uses and result in approximately the same number of persons and housing units in each district.* The districts delineated on this basis are shown on Fig. 18.

Field Surveys

Field surveys were made to identify buildings which are structurally deficient, as evidenced from external inspection. There was no means of determining the existence of plumbing facilities from such exterior survey. The presence or absence of adverse environmental factors such as traffic congestion, inadequate off-street parking, or lack of open space also was noted.

Information on Residential Conditions

The 1960 census determined the condition of housing, whether sound, deteriorating, or dilapidated and, in addition, the existence or absence of plumbing facilities. The 1960 U.S. Census reported 3,833 housing units in Harwich, of which 466 or about 12.2 percent were classified "substandard." This compares to 16.3 percent on entire Cape Cod.** Thirty-nine housing units were classified as dilapidated and 90 as deteriorating (see Table 29).

Based on our field surveys we estimate that the present numbers of deteriorating and dilapidated housing units is 125 to 140 and 40 to 50, respectively. These figures shown an increase in deteriorating units since 1960. Obviously from our external field surveys there was no way of determining the change in the existence of plumbing facilities.

The 1950 U.S. Census did not include a determination of deteriorating units, but considered "substandard" as indicating dilapidation or lack of a private bath. Two hundred and three such units were found in Harwich in 1950. By 1960 this had increased to 374 units. There is a definite trend towards an increase in number.

*The planning districts set forth in the Existing Land Use, Population and Housing chapters of Part I of this report are the same as these planning districts.

**Similar information for neighboring towns is not available from the published census information.

Table 29. Condition of Housing - 1960

Housing condition and plumbing	Planning district*						Total town
	15A	15B	16A	16B	17A	17B	
Sound but lacking plumbing facilities	142	65	2	105	21	2	337
Deteriorating	11	5	18	39	9	8	90
Dilapidated	1	0	16	7	2	13	39
Total substandard	154	70	36	151	32	23	466
Percent total units	19.5	14.0	7.6	25.9	4.4	3.2	12.2
Total units	789	498	476	582	773	715	3,833

*See Fig. 5 for location of planning districts.

Source: U.S. Census, 1960.

Information on Nonresidential Conditions

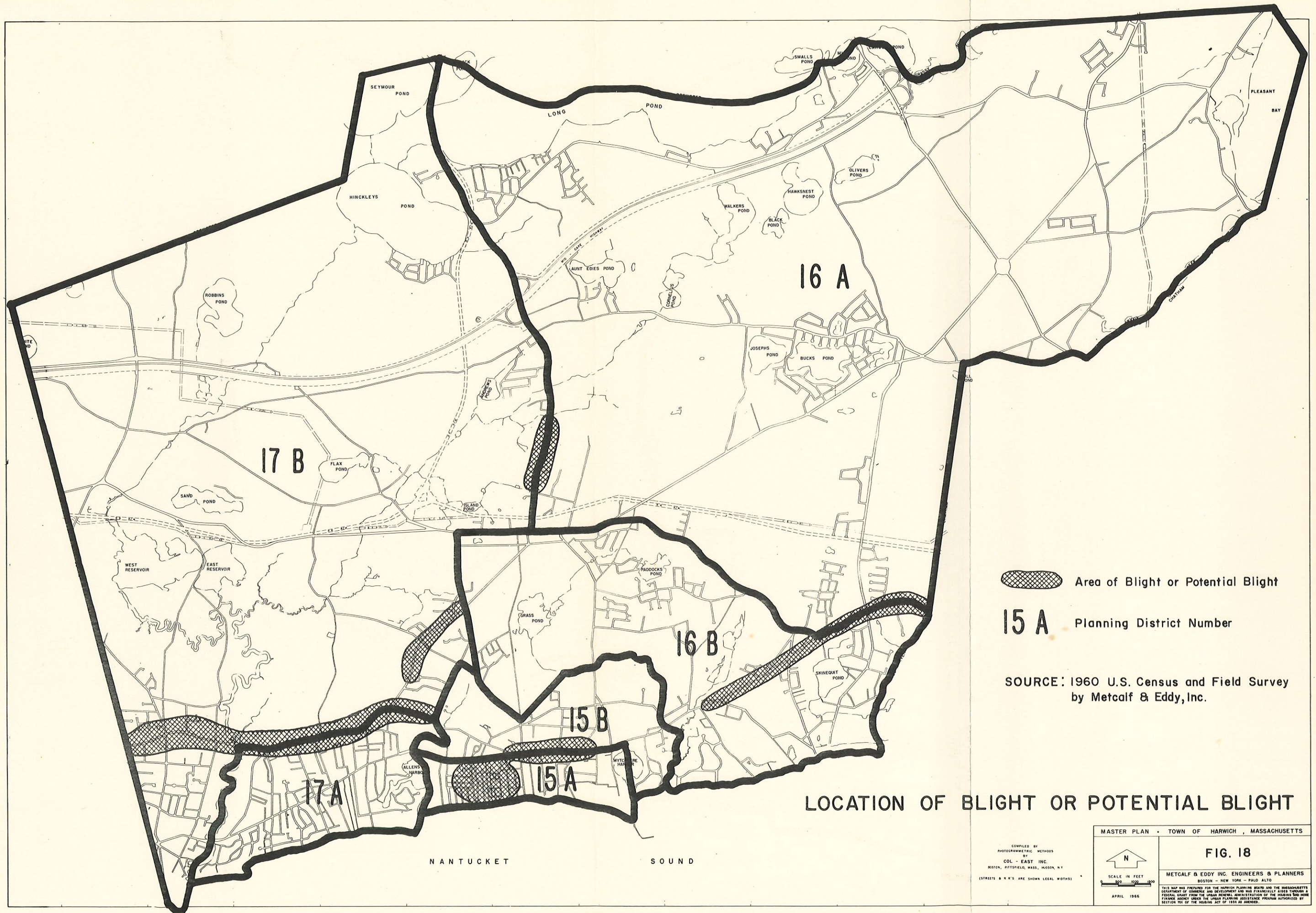
The 1960 U.S. Census does not provide information on nonresidential building conditions.


Approximately 60 dilapidated and deteriorating non-residential buildings were found by field survey. In most cases these consisted of inadequate original construction. Most of the nonresidential buildings built since World War II are in relatively good condition.

Location and Extent of Blight or Potential Blight

As shown on Fig. 18, six concentrations or areas of blight or potential blight were found from field surveys. Three were along Route 28, one in the "campgrounds" in the Harwichport business area, one along Route 39, and one along Route 124.

In addition, there are many scattered dilapidated and deteriorating individual buildings located particularly in planning districts 16A and 17B of the town. A summary of planning district characteristics is presented in Table 30.



 Area of Blight or Potential Blight

15 A Planning District Number

SOURCE: 1960 U.S. Census and Field Survey by Metcalf & Eddy, Inc.

LOCATION OF BLIGHT OR POTENTIAL BLIGHT

MASTER PLAN - TOWN OF HARWICH, MASSACHUSETTS

FIG. 18

METCALF & EDDY INC. ENGINEERS & PLANNERS
 BOSTON - NEW YORK - PALO ALTO

SCALE IN FEET
 0 500 1000 1500

APRIL 1966

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF COMMUNITY AND DEVELOPMENT AND WAS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN FEDERAL ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

COMPILED BY
 PHOTODIAGRAMMETRIC METHODS
 BY
 COL. - EAST, INC.
 BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.
 (STREETS & R.R.'S ARE SHOWN LEGAL WIDTHS)

Table 30. Planning District Analysis Summary

Item	Planning district*					
	15A	15B	16A	16B	17A	17B
Population (year-round)	280	503	705	715	545	999
Housing units (year-round and seasonal)	789	498	476	582	773	715
Area (acres)	222	411	6,583	1,429	489	5,208
Population density (year-round in persons per acre)	1.3	1.2	0.1	0.5	1.1	0.2
Facilities and services needs**						
Street improvements	X	X	0	X	X	X
Off-street parking	X	X	0	X	X	X
Schools	0	0	0	0	0	0
Recreation	X	X	0	X	X	0
Public water	X	X	X	X	X	X
Public sewerage	X	X	0	0	X	X
Drainage	X	0	0	0	0	0
Sidewalks	X	X	0	X	X	X
Number of substandard residential units***	154	70	36	151	32	23
Number of substandard nonresidential units****	15	10	5	15	10	5
Principal causes of blight or potential blight*****	A,C, D,E, F,G	A,B, C,D, E,F, G	B,D, H	A,B, C,D, E,F, G	A,B, D,E, F,G	B,D, H
Planning district classification and program recommended*****	C	B	A	C	A	A

*See Fig. 5 for location of planning districts.

**"X" indicated facility need, "0" indicated facilities adequate or satisfactory.

***From 1960 U.S. Census.

****From field survey by Metcalf & Eddy, Inc.

*****Incidental causes of blight: (A) age, and/or inadequate original construction; (B) poor building maintenance; (C) excessive building and population density; (D) lack of adequate plumbing facilities; (E) inadequate facilities and services; (F) incompatible or mixed land uses; (G) heavy traffic flow and congestion; (H) poor yard maintenance.

Notes continued on next page.

NOTE

*****Planning district classification and program recommended:

- (A) Sound planning district, minimum local program needed, including code enforcement and public improvements
- (B) Average planning district, planning needed, special attention to public improvements and adoption and strict enforcement of adequate housing; plumbing, subdivision, building, and zoning regulations.
- (C) Deficient planning district, spot clearance may be needed, should be re-examined by interior surveys for possible use of urban renewal.

Adequacy of Community Facilities and Services, Both Public and Private

The observed problems of adequacy of community facilities and services also are shown in Table 30. The principal problems relate to street improvements, public sewers, public water and sidewalks. The correction of these situations is discussed in detail in the chapters on Circulation Facilities, Community Facilities, and Public Utilities of Part II of this report.

Causes of Blight

The causes of blight throughout the town resulting in both concentrations and isolated cases of deteriorated and dilapidated building are also shown in Table 30. These causes consist principally of: age and/or inadequate original construction, poor building maintenance, excessive building and population density, lack of adequate plumbing facilities, inadequate facilities, and incompatible or mixed land uses, heavy traffic flow and congestion and poor yard maintenance.

The principal causes of blight in the southern or built-up portions of the town are heavy traffic flow and congestion along Route 28, age and/or inadequate original construction of commercial buildings in the Harwichport business area along Route 28, lack of adequate plumbing facilities, and lack of off-street parking facilities.

The principal cause of blight in the northern or largely undeveloped portions of the town is poor yard

maintenance. Some danger also exists regarding excessive building density on soils unsuitable for development without both public water and sewerage systems. This situation occurs principally in areas adjacent to ponds.

Characteristics of Families Affected by Poor Housing

The only readily available source of information on the economic and social characteristics of Harwich families is the 1960 census. Since the number and percentage of substandard units is small, it would be virtually impossible, without a house-by-house survey, to obtain accurate information regarding the characteristics of families living in these substandard houses. Such a detailed survey is beyond the scope of this study.

From field observations it is expected that there is no single major characteristics of these families. They consist of a combination of retired persons living on a low income, large families whose "breadwinner" does not have a steady year-round job, and "fatherless" families on public welfare. In Planning District 16A many such substandard units appear to be occupied by minority families.

Of the town's 466 substandard houses an estimated 375 are seasonal. The characteristics of the families occupying these houses during the summer months are probably not a factor in the condition of their houses. Their classification is more apt to be the result of lack of adequate plumbing facilities, inadequate original construction and lack of proper building maintenance, than lack of economic ability to improve their substandard house.

Identification of Steps Needed to Eliminate Present Blight and Prevent Future Blight

The principal steps needed to eliminate present or prevent future blight consist primarily of: elimination of heavy traffic and congestion on Route 28; provision of adequate indoor plumbing facilities for all units; construction of a public sewerage system in the southern portion of Planning District 17A and through Planning Districts 15A and 15B; extensions to the public water system in Planning Districts 17A and 16B; provision of open space land in Planning Districts 15A and 17A; construction of off-street parking facilities in business areas, particularly Harwichport Center; and adoption and strict enforcement of housing, plumbing, building, subdivision, and zoning regulations. In certain cases spot clearance may be needed.

Only after detailed interior inspection could it be determined if the business area of Harwichport Center would qualify as an urban renewal project.

Consideration of Selected Applicable Federal Financial Programs

The various financial assistance programs of the U.S. Department of Housing and Urban Development (HUD) including Urban Renewal, Public Housing, Public Facilities Planning, Urban Beautification, Open Space, Code Reinforcement, Demolition Grants, etc., were considered in carrying out the objectives of eliminating present blight and preventing future blight.

Harwich already has taken advantage of the Public Facilities Loan Program of HUD for both sewer and water planning. Under this program the town receives an interest-free loan for preparing a sewer or water plan. Of the remaining programs under which Harwich should be eligible to receive financial assistance, it is suggested that the town participate in both the Open Space and Urban Beautification Programs. Under these two programs Harwich could receive up to 50 percent of grants for acquiring, clearing, developing, and beautifying the land. If an interior survey substantiates the suspicion that Harwichport business area is eligible as an urban renewal project, Harwich should consider applying for financial assistance under the Title I Urban Renewal Program.

While it does not appear desirable at this time to establish a Public Housing Authority and construct elderly housing, this conclusion should be re-examined within the next five years.

PART II

1980 DEVELOPMENT PLAN

In the first chapter of Part II are presented development goals, a design philosophy and various design schemes upon which to base the Future Development Plan. In subsequent chapters are presented the individual elements of the Plan including recommended policies and improvements. Subjects covered include Circulation Facilities (highways and streets, parking, and other facilities) Community Facilities (schools, recreation and conservation, and town buildings and lands), and Public Utilities (sanitary sewerage, water, storm drainage, and refuse disposal and collection).



DEVELOPMENT GOALS*

Proposed Goals

Basis of Selection. These goals were selected in collaboration with the Planning Board and other town officials after discussion of alternatives and their implications upon the future development of Harwich.

Criteria. The proposed goals should meet certain criteria based upon:

1. Assurance of sufficiently wide support within Harwich so that actions based on them are politically feasible.
2. Reasonable relationship to both present and future population and land use projections for Harwich.
3. Consistency with one another.

Goals. The following goals are proposed:

1. The unique scenic qualities of Cape Cod should remain forever a part of Harwich life.
2. Man-made elements of the environment should be appropriate and harmonious in the natural setting and in relation to other man-made elements.
3. Harwich should continue to remain principally a town of one-family detached homes. Only a small portion of the town should be devoted to apartments, hotels, or motels.
4. Various village names, such as Harwichport, South Harwich, West Harwich, etc., should be gradually subordinated in favor of emphasizing the municipality of Harwich.
5. The median value per dwelling unit should be increased.

Where does tax money come from?

*Planning standards establishing space and location requirements and, in a few cases, accompanying construction specifications for guiding future development are contained in later chapters as appropriate by subject.

6. The commercial base should be sized principally for service to the year-round and summer residents of the population. Except for businesses in existing villages, future retail and service commercial areas should consist of a relatively few shopping centers distributed throughout Harwich and several small limited business areas along Route 28 - both dependent upon automobile transportation. The average lot and building size of all commercial establishments should be increased significantly.
7. No particular encouragement should be given to attracting manufacturing, except where it will employ retired persons or will not require a public sewerage system.
8. Appropriate areas for private or public institutional uses should be provided, and some institutions encouraged to locate in Harwich.
9. Future lot sizes should be determined by land suitability. Whereas a public water system should be designed and extended to serve almost the entire town, a public sewerage system should be designed and built only where it is needed as a definite public health measure. Minimum lot sizes set by the zoning by-law for undeveloped portions of the town should be based on suitability for on-lot sewerage systems.
10. Over 20 percent of the town area should be set as permanent open space. There should be a system of greenways connecting various activity centers throughout the town.
11. No further encouragement should be given to increasing public use of existing salt-water beaches or salt-water landings, or constructing additional such facilities. The public use of similar inland fresh-water facilities should be encouraged.
12. High median quality should be striven for in all public school facilities.
13. Additional town buildings and lands should be built with due regard to proper facilities to serve retired persons.
14. The operation of cranberry bogs should be encouraged.

15. Large-scale extraction of sand and gravel should be discouraged because of the destruction of scenic values.
16. Future design should be in accordance with a definite design philosophy (see next section).
17. The target date for the Future Development Plan should be 1980 but any design scheme should be based on a much longer time consideration.

Design Philosophy

A basic design philosophy for Harwich can be outlined as follows:

1. Harwich is beautiful and vulnerable. The native plants and wildlife are especially sensitive to overdevelopment. Their destruction is visible at the sites of old villages, and on old farmland, where the plants are weeds and the soil is barren, years after all human habitation has ceased. The unique plant communities of Harwich should be identified, and preserved through the maintenance of open, natural areas free from destructive development. This will also serve to preserve and protect the songbirds and other wildlife, which can only survive under the proper ecological conditions.

2. Development is inevitable and must be accommodated. Today large areas of Harwich are undeveloped, but high and rising land values are testimony to the imminence of development. Harwich's advantages of amenity, the availability of developable land, and improved accessibility make inevitable a continuing attraction of summer residents and retired persons. Through the technique of public purchase of lands for conservation and recreation purposes the expected development can be confined to a desirable pattern of private areas, but the amount of development will not be appreciably affected by this or any other available public control.

3. Uncontrolled growth is inevitably destructive. Occurring sporadically, spreading without discrimination, it will slowly but surely level the pines, crowd around the ponds, cover the landscape with its smear, and destroy all that is beautiful and memorable. No matter how well designed each individual subdivision may be, no matter if small parks are interfused with housing, the great landscape will disappear and become only a receding memory. Should no new open-space

program be carried out, growth will assume the same form in Harwich as it does elsewhere on Cape Cod. Large portions of Upper Cape towns illustrate the general effects of unchanneled development on Cape Cod.

4. Development must conform to development goals. Only an action program of open-space acquisition and the promotion of good design can enable Harwich to achieve these goals.

5. Observance of planning principles can avert destruction and ensure enhancement. If, indeed, uncontrolled growth inevitably destroys, what principles can preserve natural beauty and determine the appropriate locations and character of development? The physical landscape itself holds the answer. The landforms (hills, valleys, etc.), the wetlands, the vegetation, and existing development must be allowed to shape the form and character of future development.

The design schemes presented in the next section illustrate the necessary approach. Designs appropriate to beach, salt marsh, salt creek, freshwater creek, pond, cranberry bog, pine woods, and town center are illustrated.

The basic requirement in building is to realize that open space is as important to a subdivision as streets and septic tanks. Houses must not be cut off from the view in this basically open landscape.

6. Harwich can absorb all prospective growth without despoliation. Since there is not a scarcity of land, but an abundance, the problem is one of controlling development, partially through zoning and subdivision regulations, and partially through the green skeleton of conservation and recreation land. By using these techniques, despoliation can be averted with lower densities of housing development than is now being built, yet all the projected growth can be accommodated with room to spare.

7. Planned growth is more desirable and more profitable than unplanned growth. In other words, growth that is controlled and channeled expressly to benefit a town is far more likely to produce results favorable to the town, than is growth that is not planned for the town's benefit. In the matter of profit to a town, figures show that the cash balance of receipts over costs to the towns from land development will usually be greater when such development is planned. This is because the land is put to the best use from the point of view of the over-all town. There are also matters such as the beauty of the town and

over-all environmental factors, compatibility of developments, and long range integration of municipal facilities with land development. Under planned growth these factors can be controlled for the financial benefit of the town; if uncontrolled they can mean development that is uneconomical for the town or even costly.

In short, all development in a town should be both of a type that enhances the town, not detrimental to it, and financially profitable to it. Both these ends can be better realized through planning.

8. Public and private powers can join in partnership to realize the plan. The private developer in Harwich must become aware of the problem and its solution. He must understand that the natural form of the land and the character of surrounding development must be considered in planning and designing new subdivisions and other private developments. The Planning Board must furnish design criticism to help the developers to achieve a desirable and pleasing environment. See next section for suggested design schemes.

Design Schemes

Waterfront Development. It is possible that motel-restaurant-amusement complexes may be developed at appropriate points along the shore of Nantucket Sound. The first requirement of such a complex is convenient and appropriate spatial relationships between the various activity locations. Sleeping rooms in the motel should be separated from nighttime activity centers such as a theater or a nightclub. A restaurant would benefit from being close to the beach - the diners would have the view and the breeze, and the bathers would have the convenience of a restaurant "on the beach."

The second basic requirement is that enough land be available to accomplish the necessary arrangement of facilities. Each complex should have a gross area of at least 20 acres. There is the possibility that some of the older housing adjacent to the Sound might be purchased and removed, thereby creating such a site. Fig. 19 illustrates a general type of layout and some of the features which might be included in a new resort complex.

Salt Marsh Development. The importance of salt marshes to the well being of shellfish, birds, and wildlife in general has been established. The preservation of the marshes also will benefit the community by maintaining the important scenic values associated with them. The objective in development of salt marshes in Harwich is to allow the enjoyment of the view for as many residences as possible, while protecting the marsh from pollution or encroachment by filling, dumping, or construction.

The salt marshes near the coast are already surrounded by development, and there is little likelihood that any change in the pattern will occur before 1980. However, further inland, we have the small marsh north of Allen's Harbor, and the great Herring River marshes.

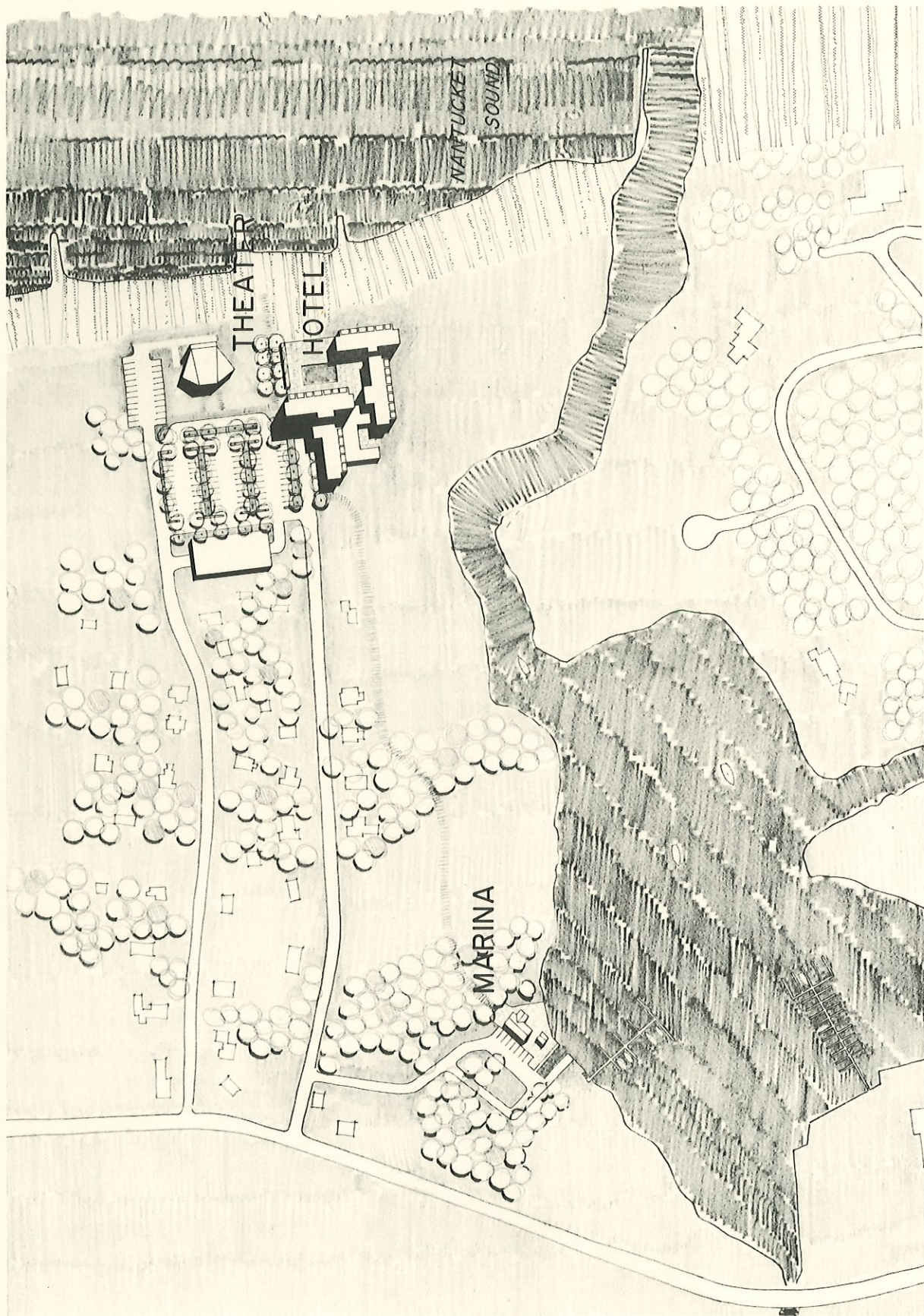
An opportunity exists to create a very pleasant residential area around the Allen's Harbor salt marsh. The proximity of Route 28 creates a problem of conflicting land uses, which could be overcome by the effect of the increased economic values associated with more intensive development. Fig. 20 indicates a possible development pattern.

The Herring River marshes, because of their vast expanse and value to students of natural science, present a different sort of design opportunity.

Within the general area of the Herring River marshes there are occasional low hummocks or "islands." Houses have been built on some, while others are still vacant. Further development of these islands is not recommended. Filling would have a detrimental effect on the marsh and the high-water table would prevent the proper operation of septic tanks. Access roads or causeways to these islands would disrupt the pattern of the marsh and destroy large sections of the original ecology. These hummocks and islands should be preserved in an undisturbed state.

It is recommended that no fill be permitted around the edge of the Herring River salt marshes, and only land above the 10-ft. contour be considered for development. Fig. 21 shows the area below the 10-ft. contour and the areas of encroachment by existing structures. The Harwich Conservation Commission should seek expert assistance for determining the best way of realizing the potential research and educational values of these marshes.

FIG. 19



MASSACHUSETTS

TOWN OF HARWICH

MASTER PLAN

SKETCH OF POSSIBLE RESORT DEVELOPMENT
NEAR NANTUCKET SOUND

THIS MAP WAS PREPARED FOR THE HARWICH TOWN BOARD BY METCALF & EDDY, INC. ENGINEERS AND PLANNERS AND WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE ADMINISTRATION AUTHORITY AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.



OCT., 1966

BOSTON · NEW YORK · PALO ALTO

ENGINEERS AND PLANNERS

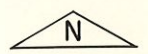
METCALF & EDDY, INC.



MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

DEVELOPMENT ADJOINING MARSH LANDS

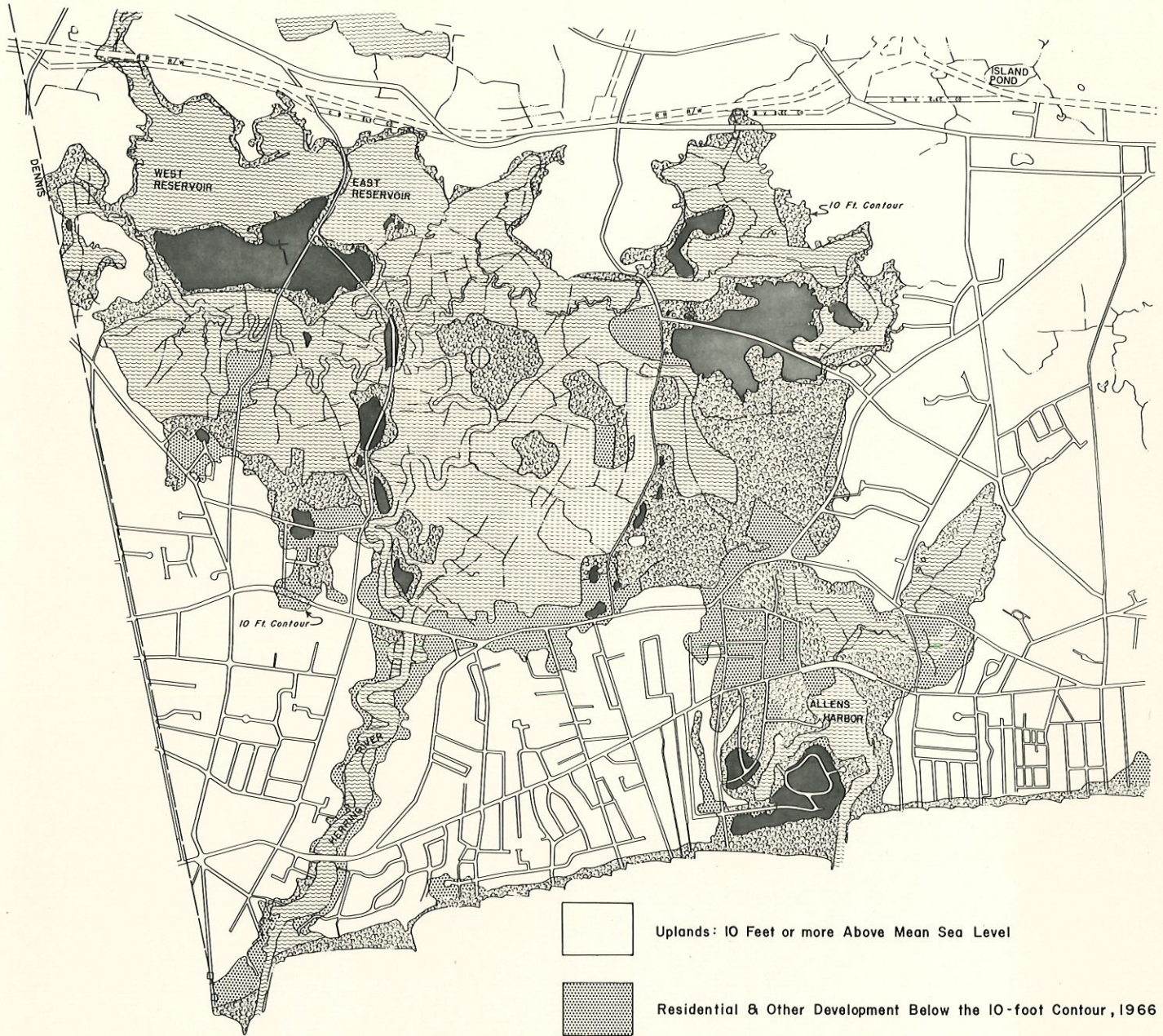







OCT., 1966

METCALF & EDDY, INC. • ENGINEERS & PLANNERS • BOSTON NEW YORK PALO ALTO

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
57 SOUTH EAST ASIAN AVENUE
CHICAGO, ILLINOIS 60607



RECEIVED
DEPARTMENT OF CHEMISTRY
UNIVERSITY OF CHICAGO
MAY 17 1964



-  Uplands: 10 Feet or more Above Mean Sea Level
-  Residential & Other Development Below the 10-foot Contour, 1966
-  Wetlands: Salt Marsh, Swamps, Ponds, Cranberry Bogs & Herring River
-  "Islands", 10 Feet or more Above Mean Sea Level.
-  Lowlands: Below the 10-foot Contour, Not Developed & Not Wetlands

HERRING RIVER MARSHES & ASSOCIATED AREAS

SOURCE: U.S.G.S. Map and Land Use Survey, Aerial Photos.

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS	
 	FIG. 21
	METCALF & EDDY INC. ENGINEERS & PLANNERS BOSTON - NEW YORK - PALO ALTO
	<small>THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF COMMERCE AND DEVELOPMENT AND WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE FEDERAL ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.</small>

Salt Creek Development. Along Muddy Creek the wooded hillsides are too unique and valuable for development in an intensive manner. Any development should be kept back about 300-500 ft. from the creek. Access to the creek for boating and related purposes should be provided only at two or three public landings.

Along the Herring River, the banks are fully developed on both sides south of Route 28. North of Route 28 the salt marsh begins, and intensive development is not recommended.

Freshwater Creek Development. The only freshwater creek of consequence in Harwich is the Herring River, north of the salt marshes and south of Hinckley Pond. Here the Herring River flows in a fairly rugged valley, with steep sides, through a series of marshes and cranberry bogs. This valley has been recommended as a greenway conservation area by the Massachusetts Department of Natural Resources.*

As in the case of Muddy Creek, development should be kept back about 300-500 ft. from the river. Within this greenway only recreation, education, and conservation uses should be permitted. It should serve as a focus for residential development in the surrounding area.

The Blair Report recommends a minimum lot size of 80,000 sq. ft. north of Great Western Road, except for the area around Hinckley, Seymour, and Long Ponds. This is an over-all density of about one-half housing unit per acre. Perhaps along with establishing a minimum lot size of 80,000 sq. ft., the developer could be given the option of meeting the maximum density of one-half housing unit per acre, with freedom to design more desirable house groupings, achieving preservation of open space, and reducing the amount of streets necessary to serve the residences. This would be what is usually called a "planned unit" or "cluster" subdivision.

Fig. 22 illustrates the kind of development which would be possible in the kettle-and-hummock terrain south of Hinckley Pond. Fifty homes are sited on a tract of 100 acres, with proper relationship to the topography and with free pedestrian access from all houses to the Herring River greenway.

*Mattheisen and Toner, A Study of the Marine Resources of Barnstable County, Massachusetts, 1963, p. 107 and Fig. 16.

Pine Woods Development. Pine woods cover most of the existing undeveloped land in Harwich. Many recent subdivisions have been in the woods, with no pond or cranberry bog for view or focus. They have failed to take advantage of the only opportunity on these sites - topography. The scale of this topography is very small, and, consequently, a varied rather than uniform pattern of house siting is needed. The basic mistake of most of the recent subdivisions in Harwich has been to attempt to impose a uniform and repetitive arrangement of house lots on this distinctively nonuniform land surface. The result has been wasteful development, with unbuildable house lots, excessive area in streets, and excessive grades and a difficult maintenance situation with respect to the streets.

Fig. 22 illustrates the kind of development which could be accomplished in the wooded lands.

Pond Development. The Blair Report commented on this type of development as follows:*

"As the supply of ocean-front land is used up and because some people enjoy a freshwater site for a summer home, the shores of the inland ponds can be expected to develop with some rapidity. There are a number of problems involved in this development, chief of which is the role of the public.

"Access must be open for the general public to use any of the great ponds, that is, ponds which are 10 acres or more. In these perhaps a form of use-control can be effected by the facilities which are offered. A parking lot at the water's edge, with a boat launching ramp, will aid the owner of a motorboat; a long walk from the road to the shore, and no dock or launching ramp, will limit boating to portable boats. Coordinated action by the owners of pond property will help in obtaining what the majority desires. Public use of ponds can be compatible with pleasant residential development if towns will control the traffic, parking, and such problems as the use of outboard motors.

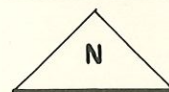
*See the Blair Report, pp. 37 & 38.

Hinckleys Pond

MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

FRESHWATER CREEK AND PINE WOODS DEVELOPMENT



OCT., 1966

"The shores of other ponds might be kept in community ownership for the joint use of the town property owners, and a group of ponds might be linked by connecting strips of community land. This would set up a trail for hiking, or, if the connections between ponds were along streams, would allow canoeing and fishing over a greater distance. Making it community land would also be a valuable method of keeping construction off a fragile swamp bordering a pond or stream.

"Where a sightseeing road comes close to the edge of a handsome pond a scenic easement might be considered to preserve the view without taking the land out of private ownership. At present, this may not seem desirable, but as pond shores become built up, without such provision the pond views open to sightseers will eventually disappear."

As shown in Table 9, there are 16 ponds in Harwich with an area of 10 acres or more (great ponds). A means of public access should be established for each of these ponds. This might be accomplished, in some cases, by the Planning Board through use of its power to reserve recreation areas in subdivisions for three years, during which time the town has the opportunity to purchase the access area.

The area around Long, Hinckley, and Seymour Ponds is a naturally unified area with a common focus on the lakes. The portion of this land within Harwich has been mostly subdivided, except for the southwest side of Hinckley Pond. Fig. 23 shows a possible development pattern for the area south of Hinckley Pond. Instead of a minimum lot area of 15,000 sq. ft., as presently permitted by the prospective by-law, a maximum density of 2-1/2 housing units per acre was used.*

The major design principles illustrated by Fig. 23 are: creating house sites in accordance with topography, providing direct and convenient pedestrian access to the water for all houses; reducing service road footage through judicious use of the cul-de-sac; and eliminating through traffic within the residential area.

*Two and one-half times 15,000 sq. ft. does not quite equal 1 acre. This is because in the ordinary subdivision about 25 percent of the land would be in streets. Therefore, the true density is somewhat less than a density based on only lot area.

Cranberry Bog Development. Cranberry bogs are an important scenic and economic feature of Cape Cod. Unfortunately, economic pressures for other uses places such existing use in jeopardy. When this low swampy land will return more money as house lots than it will as a cranberry bog, the developer will move in and the farmer will move out. This is apt to happen particularly in smaller bogs owned individually by farmers who are unable to compete with the farmers with large land holdings.

The Blair Report suggests the scenic importance of the cranberry bogs, as follows:*

"Cranberry bogs are traditional on Cape Cod, agriculturally and scenically. As a source of supplementary income for the year-round residents, they should be encouraged; but, more than that, their lovely ruddy color in the autumn is one of the great attractions to the picture-taking sightseer. For this purpose alone their protection is important."

In order to create building sites in cranberry bogs, extensive filling is necessary. This tends to destroy the scenic values of the area. The use of septic tanks in such locations can create pollution of the groundwater. If the septic tank is set too low, it will not function properly. If the fill material is not properly selected and placed, the leaching bed will not function.

Cranberry bogs are covered by the State Wetlands Act** because when they are abandoned for agricultural purposes, they cease to be cranberry bogs. If someone fills a cranberry bog for nonagricultural purposes, it is classified as an abandoned cranberry bog. There are many other instances in Harwich of abandoned cranberry bogs slowly reverting to their original natural state of swamp or marsh.

Therefore, the proper location of residential development is around and not within a cranberry bog. House sites should have a view across the bog, but not close enough to it to be affected by the chemical sprays used on the bog. In some cases the bog is at the edge of a pond, and a house overlooking the bog can also have a view of the pond. In other cases the ground is rather low,

*See Blair Report, p. 31

**Wetlands Act (Chapter 130, Section 27A, and Chapter 131, Section 117C, G.L.).

FIG. 23

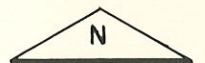


Hinckleys Pond

MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

POND DEVELOPMENT



OCT, 1966

METCALF & EDDY, INC. ENGINEERS & PLANNERS BOSTON NEW YORK PALO ALTO

but wooded around the bog, and it is possible to set houses into the woods so that each house has a view out across the bog, but the houses are not visible to one another.

Some bogs are in "kettles" with high ground all around, presenting the possibility of house sites 20 or 30 ft. above the bog surface, with an excellent view down into and across the bog.

The possibilities of siting houses around a cranberry bog are indicated on Fig. 24. Space is provided for access roads, storage space, and working areas for the cranberry grower. Pedestrian movement is provided for by a path along the edge of the cranberry bogs, leading to the shore of a nearby pond or to the Herring River greenway. The density of the development, including the cranberry bog, is not greater than one-half housing unit per acre.

Town Center Development. A design opportunity exists for accommodating most of the expected year-round population increase in villages in Harwich. The nuclei of these villages already exist. West Harwich, the Lower County Road area, and Harwichport are fairly well built-up now, but expansion is possible at South Harwich, North Harwich, Harwich Center, Pleasant Bay, and East Harwich (including the Bucks Pond area).

It is expected that the year-round population of Harwich will increase by 4,570 persons by 1980. If two-thirds of this increase occurs in the villages, the five centers listed above could each grow an average of 600 persons, or about 200 housing units.

The basic pattern of village layout is illustrated on Fig. 25. This diagram is schematic only and would never be exactly reproduced in application. However, it is useful to illustrate the combination of certain design ideas.

The commercial area is all on one side of the major intersection instead of surrounding it, in order to reduce the amount of pedestrian traffic across the intersection.

Both commercial and public and institutional uses are placed in the center of the village for maximum accessibility from all residential sections. Large public facilities, however, such as schools, should be placed at the edge of the village.

In at least two quadrants, the open space which surrounds the village is carried as a greenway to the commercial-public-institutional center, to provide pedestrian access separated from vehicular traffic and to give the active center the relief of some adjoining open space.

The streets are arranged to encourage the use of the major streets by through traffic, while keeping traffic levels low on the residential streets.

"Fingers" of residential development are extended out into the surrounding open space, to maximize the number of good house sites.

The population of one of these villages could range from 1,000-3,000 persons. This would be from 300-1,000 housing units. The area required for such a village, assuming a gross density of two housing units per acre, would be from 150-500 acres.

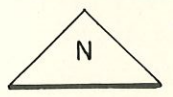


MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

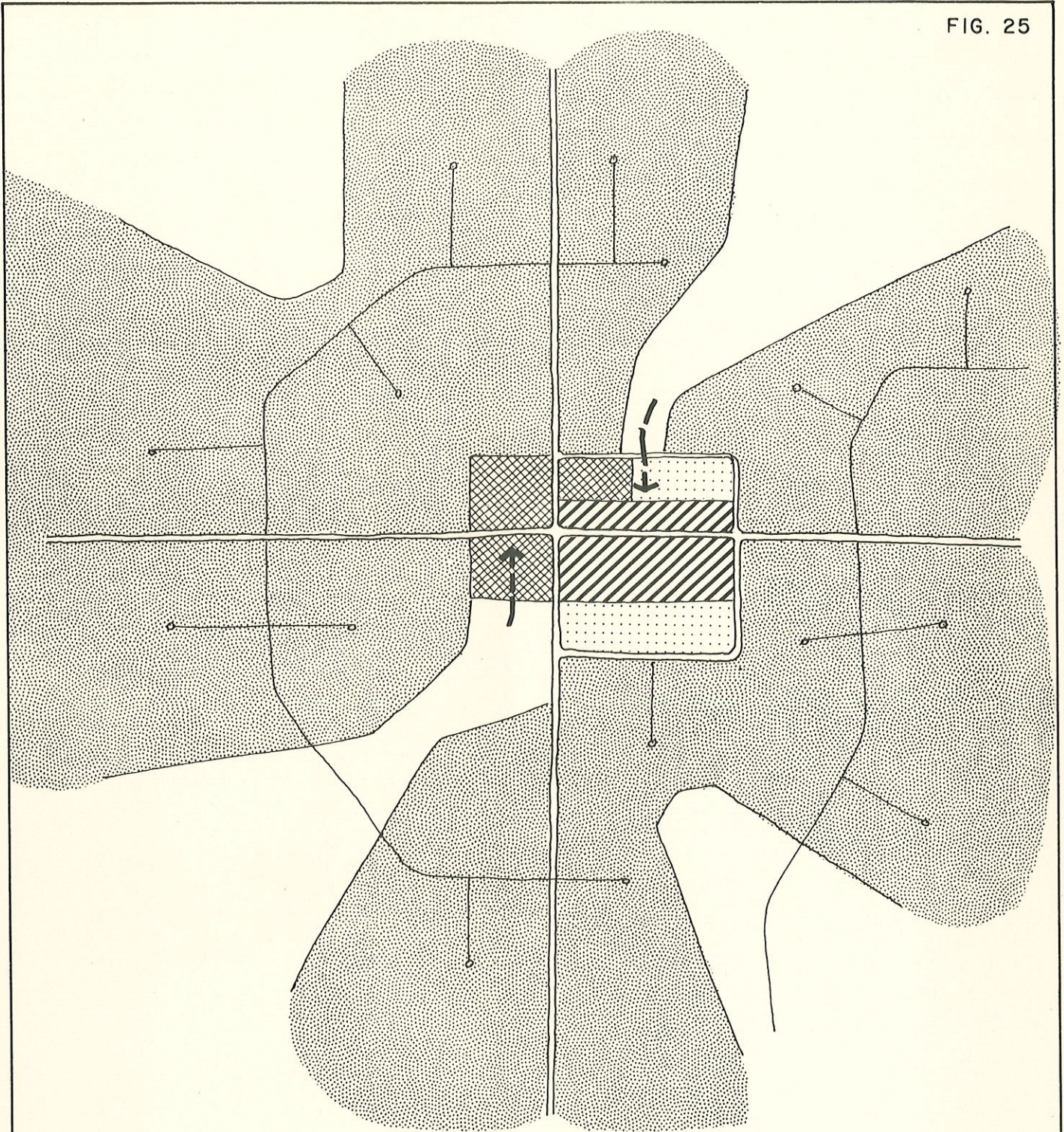
CRANBERRY BOG DEVELOPMENT

METCALF & EDDY, INC. ENGINEERS & PLANNERS BOSTON NEW YORK PALO ALTO



OCT., 1966

FIG. 25



Commercial



Residential



Open Space



Institutional



Parking



Pedestrian Path

MASTER PLAN • TOWN OF HARWICH • MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

VILLAGE SCHEMATIC LAYOUT

METCALF & EDDY, INC. ENGINEERS & PLANNERS BOSTON NEW YORK PALO ALTO

OCT., 1966

FUTURE LAND USE

Pattern

A variety of land uses have been recommended. Generally, these include: Developed (agricultural, residential, commercial, industrial, institutional, and circulation) and Open Space (wetlands and water). These uses are shown on Fig. 26, and are based upon the considerations listed below. (Note: Only major land use areas are shown, not each individual parcel such as town hall, fire station, etc.)

Agricultural

These are generally existing cranberry bogs.

Residential

Four types of residential densities are shown - rural estate, low, medium, and high. Different densities are needed to provide proper adjustment to variations in existing development patterns, land suitability, proposed service areas for sanitary sewers and water, and distance to the beach.

Rural Estate (minimum lot size 50,000 sq. ft.):
These are generally located in inland areas not now or expected to be served in the near future by a public water or sewerage system, but where land, in most cases, is at least generally suitable for development.

Low Density (minimum lot size 40,000 sq. ft.).
These are areas served by a public water system, but where there exist predominantly larger lots. In many cases, the land is classified as difficult to develop.

Medium Density (minimum lot size 20,000 sq. ft.).
These are the predominant year-round residential areas and are generally located in areas now served by a public water system, but where the land is generally suitable for development and on-lot sewerage systems.

High Density (minimum area per family 3,000 sq. ft., exclusive of parking). These are principally existing seasonal high-density areas located near Nantucket Sound that are now served by a public water system and in the near future are recommended for service by a public sewerage system. Apartments, guest houses and cottages, but not hotels or motels, are proposed for these areas.

Commercial

Four types of commercial areas are proposed - general, highway and shopping center, resort and service, and resort and hotel.

General. These are the existing older village or main street shopping areas.

Highway and Shopping Center. These are areas proposed for both year-round and seasonal highway service, retail, personal, and other services and shopping centers, and located adjacent to existing highways.

Resort and Service. These are areas proposed for limited low-density personal and retail seasonal service establishments.

Resort and Hotel. These are existing high-density areas for seasonal hotel, motel and related overnight rental places.

Industrial

These are areas proposed for service-type manufacturing and related small establishments that are highway-oriented and do not require large amounts of water and for special commercial establishments such as wholesale establishments, automotive garages, truck terminals, laundries, etc., that are not compatible with other commercial establishments.

Institutional

These are existing and proposed large publicly-owned lands such as schools, water department, active recreation,* etc., and also proposed sites for new institutions such as a preparatory school, college, etc.

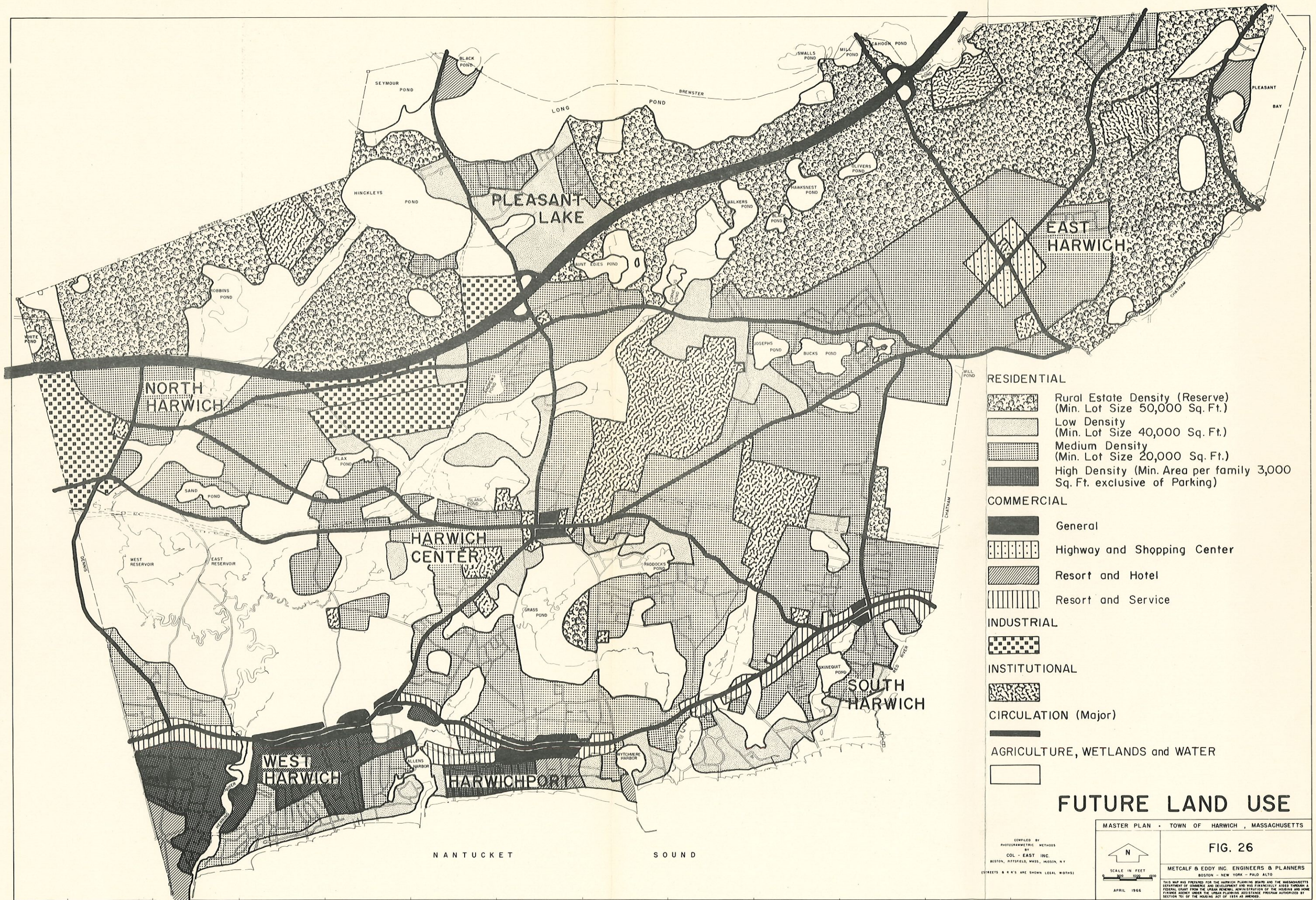
Wetlands

These are intended to provide maximum protection for natural wetlands, other than existing cranberry bogs, and to conserve large existing open areas not suitable for residential, commercial, or industrial building development, but which are valuable environmental assets.

Water

These are ponds, rivers, bogs, and harbors.

*Large conservation areas are listed under Wetlands - Conservation.



- RESIDENTIAL**
- Rural Estate Density (Reserve) (Min. Lot Size 50,000 Sq. Ft.)
 - Low Density (Min. Lot Size 40,000 Sq. Ft.)
 - Medium Density (Min. Lot Size 20,000 Sq. Ft.)
 - High Density (Min. Area per family 3,000 Sq. Ft. exclusive of Parking)
- COMMERCIAL**
- General
 - Highway and Shopping Center
 - Resort and Hotel
 - Resort and Service
- INDUSTRIAL**
- Industrial
- INSTITUTIONAL**
- Institutional
- CIRCULATION (Major)**
- Major Circulation
- AGRICULTURE, WETLANDS and WATER**
- Agriculture, Wetlands and Water

FUTURE LAND USE

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS

COMPILED BY
PHOTOGRAMMETRIC METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.

(STREETS & R.R.'S ARE SHOWN LEGAL WIDTHS)

N

SCALE IN FEET
0 500 1000 2000

APRIL 1966

FIG. 26

METCALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALO ALTO

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF COMMUNITY AND DEVELOPMENT AND WAS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

NANTUCKET SOUND

Amounts and Intensity

The amounts and intensity of future residential land uses are shown in Table 31.

Table 31. 1980 Residential
Land Use by Amounts and Intensity

Use	Proposed acres	Population(1)		Intensity, acres per person(1)	
		Year- round	Year-round and summer peak	Year- round	Year-round and summer peak
Rural- estate	2,140	500	800	4.3	2.7
Low	625	1,000	2,000	0.6	0.3
Medium	3,350	5,000	11,200	0.7	3.0
High	<u>425</u>	<u>1,000</u>	<u>5,000</u>	<u>0.4</u>	<u>0.1</u>
Total	6,540	7,500	19,000	0.9	0.3

1. Includes year-round and summer residents plus persons in cottages but not in hotels, motels, other overnight guests, day trippers or persons living in other than residential land use areas.

Source: Estimates by Metcalf & Eddy, Inc.

Analysis

An analysis of the predicted relationship of the 1980 existing land use pattern to the Future Land Use Plan is shown in Table 32.

Table 32. Land Use Analysis,
Future Land Use Plan

Use	Acres used, 1966	Estimated acres used, 1980	Acres provided, Future Land Use Plan
<u>Developed</u>			
Agricultural	560	600	1,800
Residential	1,671	3,700	5,800
Commercial	161	275	300
Industrial	198	300	500
Institutional	87	200	300
Circulation	1,108	1,400	1,600
<u>Open Space</u>			
Wetlands	9,597	6,907	3,082
Water	<u>960</u>	<u>960</u>	<u>960</u>
Total	14,342	14,342	14,342

Sources: Existing Table 4.
Estimated acres used, 1980 - Existing Land Use,
Population, Housing and Economy sections of Part I
of this report.
Future Land Use Plan - Fig. 26.

CIRCULATION FACILITIES

Highways and Streets

Definitions. Technical terms used in this section are defined as follows:

Freeway. A four-lane highway with a median strip for through or inter-community traffic with full control of access and with grade separations at intersections.

Arterial Highway. A two- or four-lane highway without a median strip, designed primarily for through or inter-community traffic without any control of access along its route or at intersections.

Collector Street. A street contained wholly within Harwich and which connects residential areas with an arterial highway.

Minor Street. A street designed primarily for access to adjacent properties.*

Average Daily Traffic (ADT). The total number of cars in both directions passing a point on a street during a 24-hour period. This is a yearly average, and during any particular day a street may carry far more or less than the ADT.

Inventory. Fig. 29 shows the existing highways and streets in Harwich in 1966. Route 6, the Mid-Cape Highway, is presented as a two-way road, but it is expected that by 1980 it will be a freeway with a median strip and two lanes in each direction. Access to Route 6 is possible only at interchange points. In Harwich, the two interchanges are located at Route 24 (Pleasant Lake Avenue) and at Route 137 (East Chatham Road).

Harwich is well served by arterial highways, such as State Routes 28, 124, 39, and 137. Most of the local traffic is carried on these two-lane facilities. Route 28 is the most important street and highway in Harwich;

*Except for isolated cases, such streets are considered as too detailed for the scope of this general plan.

it connects the areas of highest population density along Nantucket Sound. The major traffic generators in Harwich are along or within a block or two of this route and consist of retail and service establishments, residences, guest houses, motels, and hotels.

Present and Future Requirements. Fig. 27 shows the pattern of 1960 traffic volumes. Average daily traffic on Route 28 is greater than on the Mid-Cape Highway. Traffic volumes show a distinct decrease as one goes eastward toward the Lower Cape. Route 6 enters Harwich from Dennis with about three times the traffic volume with which it passes on into Brewster and Orleans. Route 28 shows the same reduction of traffic volumes by two-thirds as we move from Dennis to Chatham.

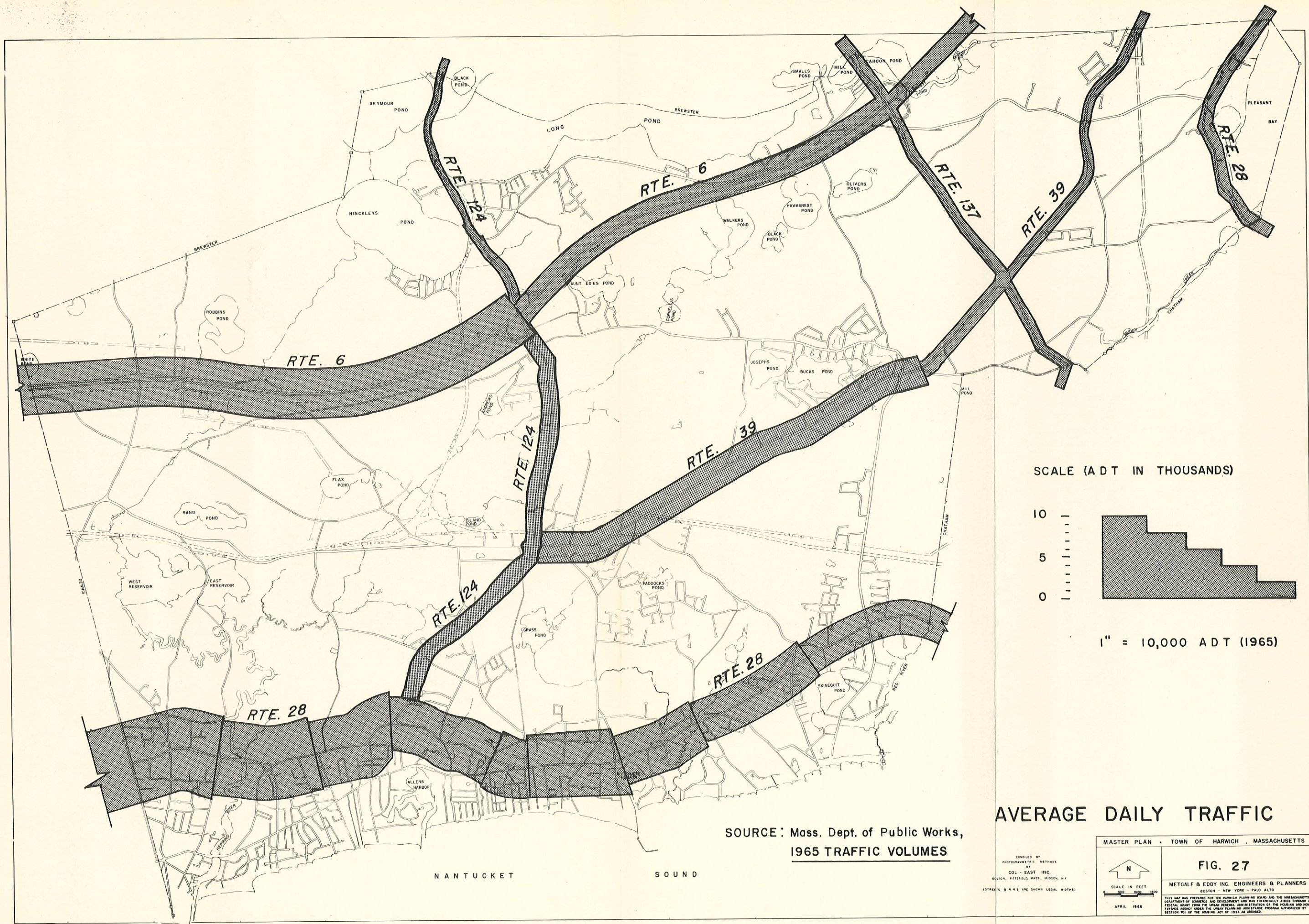
Since 1960 the ADT on Harwich highways other than Routes 28 and 6 has increased about 20 percent per year. During this period the ADT on Route 28 has increased about 15 percent per year and on Route 6 about 10 percent per year. In actual numbers of vehicles, the ADT on Route 28 has increased about 1,400 vehicles per year. On Pleasant Lake Avenue, as a contrasting example, the annual increase in ADT has been only about 400 vehicles per year.

However, ADT does not give a true picture of traffic volumes in Harwich. During the summer months, particularly on weekends and holidays, daily traffic has been 10 to 20 times the ADT.

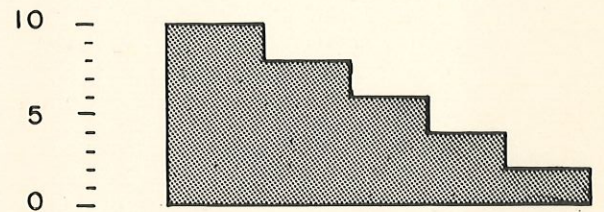
Based on past trends the 1980 ADT on highways in Harwich will be two to three times the present traffic. However, the pattern of increase by individual highway could change drastically. The addition of another two lanes to the entire length of Route 6 could increase dramatically the traffic on this highway. An increasing congestion of Route 28 would cause drivers to seek alternative means, such as a combination of Great Western Road, Main Street, and Route 39, to travel east and west through the town.

Recommended planning standards for the design of highway and street cross-sections and characteristics are shown in Tables 33 and 34.

Adequacy. Fig. 28 indicates observed circulation deficiencies. Most of these deficiencies are based on safety rather than a reduction in capacity to tolerable limits.



SCALE (A D T IN THOUSANDS)



1" = 10,000 ADT (1965)

AVERAGE DAILY TRAFFIC

SOURCE: Mass. Dept. of Public Works,
1965 TRAFFIC VOLUMES

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS

FIG. 27

METGALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALM ALTO

COPILED BY
PHOTOGRAMMETRIC METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.

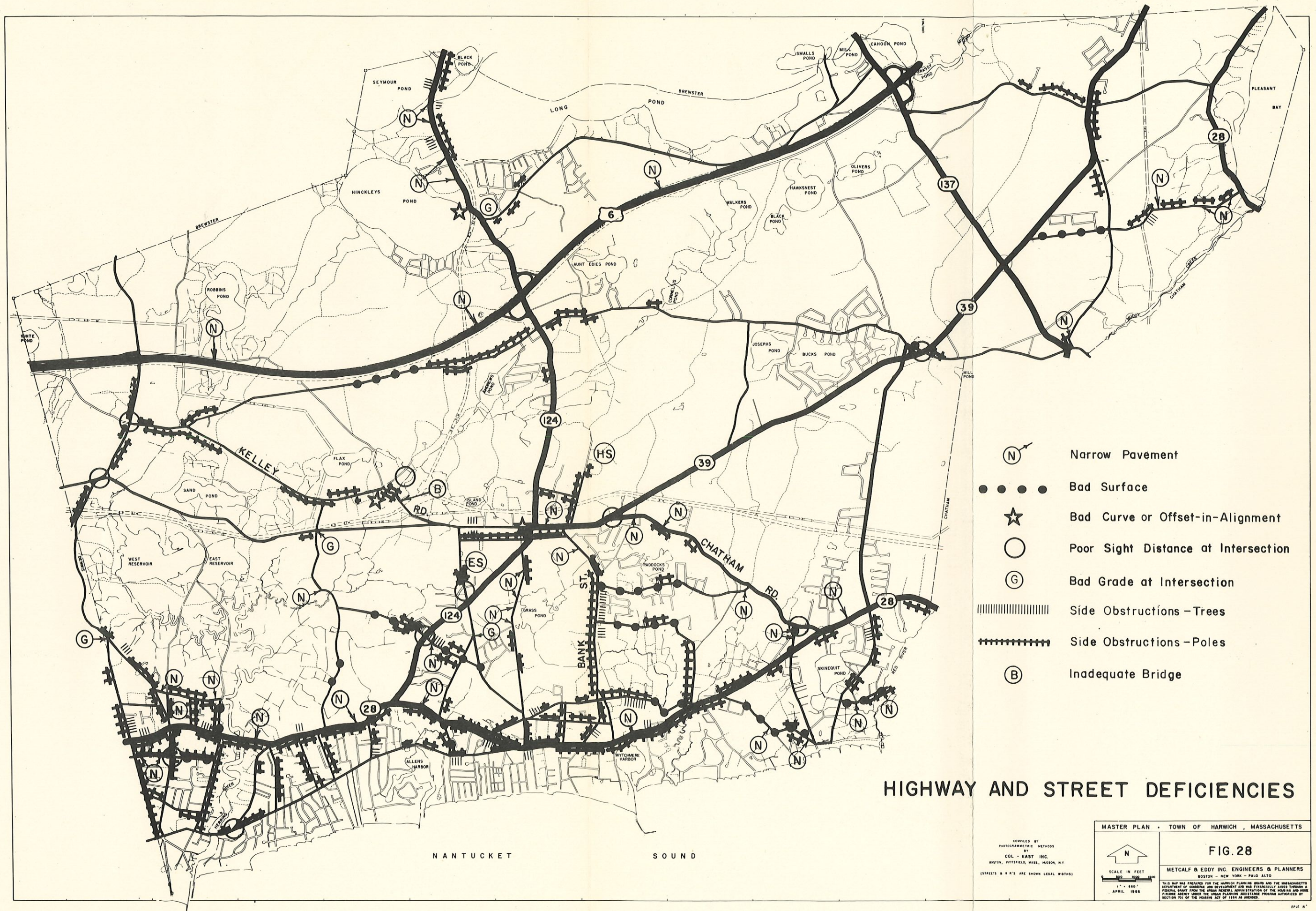
SCALE IN FEET
0 500 1000 1500









APRIL 1966

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF COMMERCE AND DEVELOPMENT AND WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING AND URBAN FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

NANTUCKET SOUND


(STREETS & R.R.'S ARE SHOWN LEGAL NOTICES)



-  Narrow Pavement
-  Bad Surface
-  Bad Curve or Offset-in-Alignment
-  Poor Sight Distance at Intersection
-  Bad Grade at Intersection
-  Side Obstructions - Trees
-  Side Obstructions - Poles
-  Inadequate Bridge

HIGHWAY AND STREET DEFICIENCIES

COMPILED BY
PHOTOGRAMMETRIC METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HOUSTON, TX
(STREETS & A.R.'S ARE SHOWN LEGAL WIDTHS)

MASTER PLAN - TOWN OF HARWICH, MASSACHUSETTS	
 SCALE IN FEET 1" = 400' APRIL 1966	FIG. 28 METCALF & EDDY INC. ENGINEERS & PLANNERS BOSTON - NEW YORK - PALO ALTO <small>THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF CONSUMER AND DEVELOPMENT AND WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN FEDERAL ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 101 OF THE HOUSING ACT OF 1954 AS AMENDED.</small>

NANTUCKET SOUND

Table 33. Recommended Highway and Street Cross-Section Standards⁽¹⁾

Item	Arterial	Collector		Minor	
		Rural ⁽²⁾	Urban	Rural ⁽²⁾	Urban
Design speed, mph.	50	40	30	30	30
ADT	over 5,000	600-5,000	600-5,000	under 600	under 600
Right-of-way width, ft.	66-100	60	60	50	50
Number moving lanes	2-4	2	2	2	2
Pavement width, ft.	44-68	44	44	36	28

- Standards for freeways shall be as established by the Mass. Dept. of Public Works.
- Rural means within an area in which the lot size averages 40,000 sq. ft. or more.

Source: Nationally-recognized highway and street standards (American Assoc. of State Highway Officials) adjusted by Metcalf & Eddy, Inc., to meet the individual needs of Harwich.

Table 34. Recommended Street Characteristics⁽¹⁾

Characteristic	Collector	Minor
<u>Curve, horizontal alignment</u>		
Minimum radius at centerline, ft.	830	270
<u>Curve, vertical alignment</u>		
Minimum clear sight distance at 4.5 ft. above pavement, ft.	350	200
<u>Intersection, Grade</u>		
Maximum, percent	3.0	5.0
Minimum, percent	0.5	0.5
<u>Intersection, sight distance</u>		
Minimum distance, ft.	700	450
<u>Side obstructions-trees and poles</u>		
Maximum distance from edge of pavement, ft.	15	10

- Design standards for freeways and arterial highways shall be as established by the Mass. Dept. of Public Works.

Source: Nationally-recognized highway and street standards (American Assoc. of State Highway Officials) adjusted by Metcalf & Eddy, Inc., to meet the individual needs of Harwich.

Based on expected future traffic requirements, most of these observed deficiencies are considered critical. The following are the major places of concern:

Narrow Pavements. The two-lane Routes 28, 6, and 39 are completely inadequate in terms of traffic capacity during the summer months. Because of fire truck access, the narrowness of Bank Street is of particular concern. The expected increase in future use of Chatham Road between Routes 39 and 28 indicates a need for the widening of this street.

Bad Surfaces. These are located on local and not state routes. They are quite extensive and a program of street repair and reconstruction is indicated for Harwich.

Bad Curves. The principal ones are located at the intersection of Routes 124 and 39, Route 124 and the N.Y., N.H. & H. Railroad adjacent to Hinckleys Pond, and at the north end of the bridge over the abandoned railroad on Kelley Road. The offset in street alignment along Route 124 in Harwich Center is particularly bad. The generally level terrain in Harwich eases the problem of street alignment.

Poor Sight Distances. Those of major significance are the intersections of Route 39 and Chatham Road, Deep Hole Road and Chatham Road, and Depot Road and Queen Anne Road.

Bad Grades. None of the four places so rated carries any large volume of traffic.

Side Obstructions - Trees and Poles. The most common highway and street deficiency in Harwich is side obstructions - the encroachment of utility poles and trees upon the pavement. The obstructions shown are within 5 ft. of the edge of pavement. Those of major concern are along Routes 28 and 39.

Inadequate Bridges. Most of the bridges in Harwich are new, on state routes, and adequate for traffic needs. The structure on Kelley Road, where the road crosses the abandoned railroad, however, is old, with unsatisfactory vertical and horizontal alignments, causing difficult approach curves.

Recommendations. Fig. 29 illustrates graphically the following major recommendations and serves as the proposed highways and streets plan.

Policy. The existing highway and street framework should be used as the basis for the plan.

Freeway. Route 6 - add the proposed two other lanes to the Mid-Cape Highway and build an additional interchange with Depot Street. This would relieve Harwich streets of a portion of the heavy truck traffic generated by proposed industries in North Harwich.

Arterial Highways.

1. Route 28 - (see separate subsection titled "Route 28").
2. Route 39 - widen and realign to meet arterial highway standards shown in Tables 33 and 34, and correct deficiencies shown on Fig. 28.
3. Route 124 - widen and realign to meet arterial highway standards shown in Tables 33 and 34 and correct deficiencies shown on Fig. 28. The present offset in alignment should be eliminated in Harwich Center by moving Sisson Road (Route 124) in an easterly direction between Parallel and Main Streets to again meet up with Pleasant Lake Road (Route 124).
4. Route 137 - widen and realign to meet arterial highway standards shown on Tables 33 and 34.
5. Great Western, Chatham, Depot, and Queen Anne Roads - improve to meet arterial highway standards shown on Tables 33 and 34 and to correct deficiencies shown on Fig. 28. If the proposed new Depot Street-Route 6 interchange is not constructed when the freeway is increased to four lanes, the improvement of Queen Anne Road should be given a high priority.

Collector Streets. Kelley Road, Bank Street, South Street, Lower County Road, Lothrop Avenue, Belmont Road, Chase Street, Julien Road, Uncle Vienes Road, Church Street, Pleasant Bay Road, and Long Pond Drive - improve to meet collector street standards shown in Tables 33 and 34 and to correct deficiencies shown on Fig. 28, including the relocation of Bank Street between Parallel Street and Main Street to meet Oak Street and the extension of Oak Street to Queen Anne Road. The improvement of Depot Street and Lothrop Avenue would eliminate the need for the improvement of Bells Neck and North Roads in the Herring River Marsh Conservation Area.

Minor Streets. Correct deficiencies on all remaining streets shown on Fig. 28.

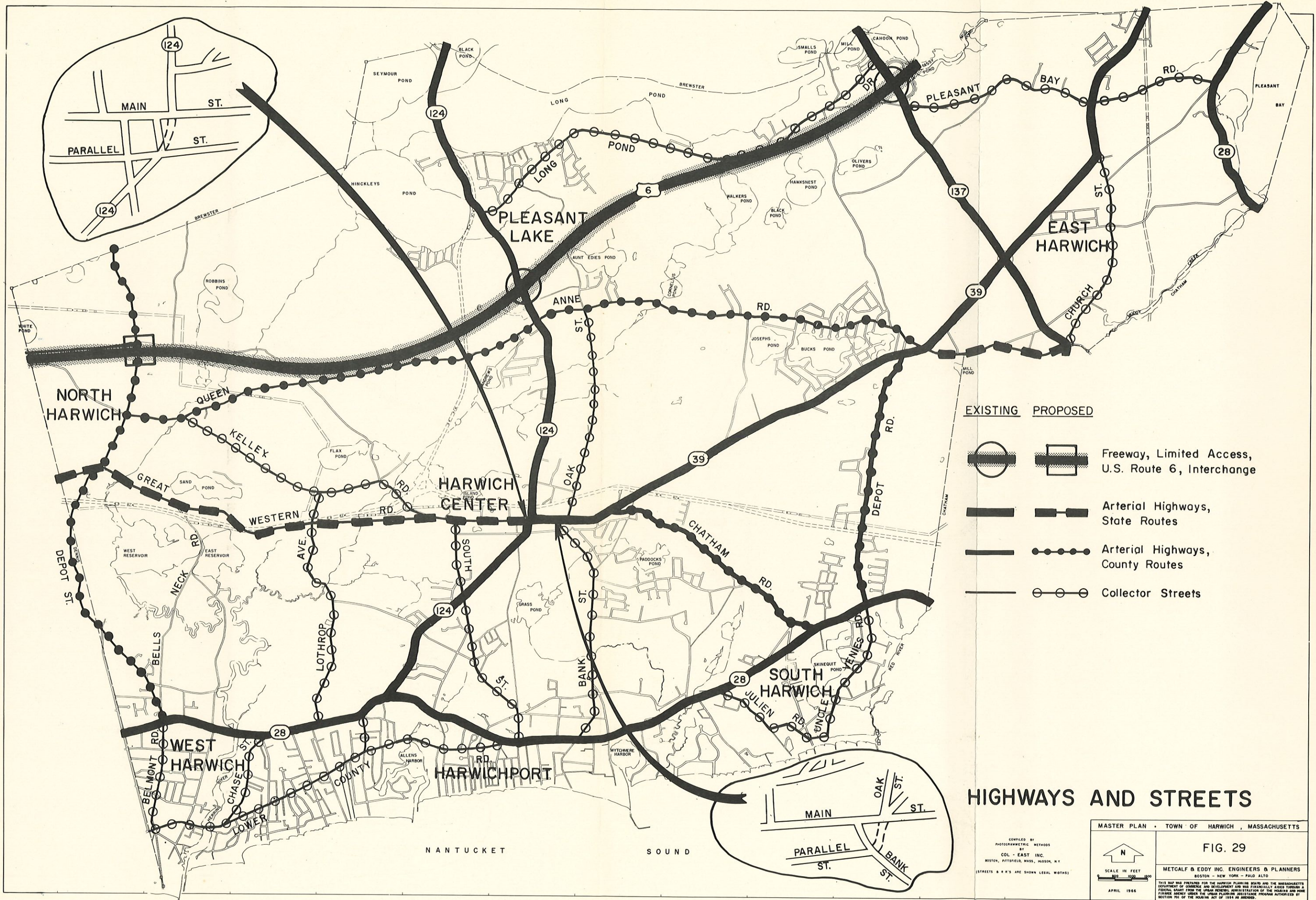
Route 28. Problems of business and amusement development along Route 28 will be discussed here.

Many persons believe that only through the property tax is there any clear benefit to the town as a whole from resort-commercial activities. For some activities, such as small restaurants and outdoor amusements, tax income is relatively small. As a result there appears to be no economic reason for permitting these small businesses to erect gaudy signs, build continuous driveway entrances, use flapping pennants and flashing lights to attract customers, build on small lots, or have inadequate building and sign setback. For traffic safety reasons alone, these practices should be discouraged.

There are several alternative means of reducing traffic congestion along Route 28 during the summer months. Generally speaking, these consist of the following.*

1. Widening the pavement to four lanes.
2. Constructing a parallel east-west two-lane route within a mile of Route 28 and making each of them operate only in one direction.

*These do not include changes in lot size, setback, etc., for adjacent properties which are covered in other elements of the Future Development Plan.



- | EXISTING | PROPOSED | |
|----------|----------|--|
| | | Freeway, Limited Access, U.S. Route 6, Interchange |
| | | Arterial Highways, State Routes |
| | | Arterial Highways, County Routes |
| | | Collector Streets |

HIGHWAYS AND STREETS

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS

FIG. 29

COMPILED BY
PHOTOGAMMETRIC METHODS
BY
COL. EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.

SCALE IN FEET
0 500 1000 1500

APRIL 1966

METCALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALO ALTO

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF CONSERVATION AND DEVELOPMENT AND WAS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN REGENERATION ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

3. Reducing conflicts between traffic entering and leaving Route 28 from adjacent properties by eliminating left-hand turns, reducing the number of intersecting streets and driveways, improving traffic channelization and other similar controls; increasing minimum lot sizes and setbacks of buildings and signs in the zoning by-law; eliminating all utility poles and trees within 15 ft. of the pavement; and applying similar measures and design controls.

Of the above three alternative means, No. 1 appears impractical. The resulting property damage would be excessive and probably unwarranted. The application of No. 2 by possible use of Great Western Road, Route 39 and a portion of Queen Anne Road as a two-lane parallel route is desirable. Regardless of the success of No. 2, it is recommended that the Harwich town officials immediately request to meet with the State Highway officials for the purpose of discussing the joint implementation of alternative No. 3.

Other Circulation Facilities

Airport. There are presently three major airports on the Cape, at Hyannis, Chatham, and Provincetown. Only the Hyannis Airport can handle commercial trunk-line planes. The Massachusetts Aeronautics Commission's master plan recommends additional airports for private planes in Falmouth and the Bourne-Wareham area. Harwich is adequately served by the Hyannis Airport for commercial flights and the Chatham Airport for private aircraft. An airport in Harwich is not recommended. The development of vertical lift aircraft might make this a reasonable possibility, but no decision can be made at this time.

Possible Use of Vertical Lift Aircraft (VTOL). It appears unlikely that such equipment will have any place in Harwich's transportation system, during the foreseeable future. Even in July and August surface transportation between Harwich and the Chatham Airport is good enough, so that a helicopter would not effect an appreciable saving in travel time. In addition, there is no industrial or commercial demand in Harwich for rapid movement of executive personnel.

The primary responsibility of Harwich, if helicopters or other VTOL's begin to land in the community, is to provide appropriate recognition of heliport

characteristics in its future land use plan and zoning by-law. The principal problem is the effect of noise and prop-wash on adjacent properties. At this time, the regular use of VTOL's in Harwich is considered so remote that pertinent revisions in the local zoning by-law are not recommended.

Pedestrian and Bicycle Ways.* It is recommended that walking and bicycling be encouraged, not only for health and recreation but also as an alternative to the automobile. If facilities are provided for the pedestrian and the bicyclist, a portion of the present traffic problems in Harwich could be eliminated.

In the past, the pedestrian and the bicyclist in Harwich have been largely ignored. Before automobiles become so dominant, people could walk safely in the street. Such practice is now extremely hazardous. Sidewalks are needed for safety.

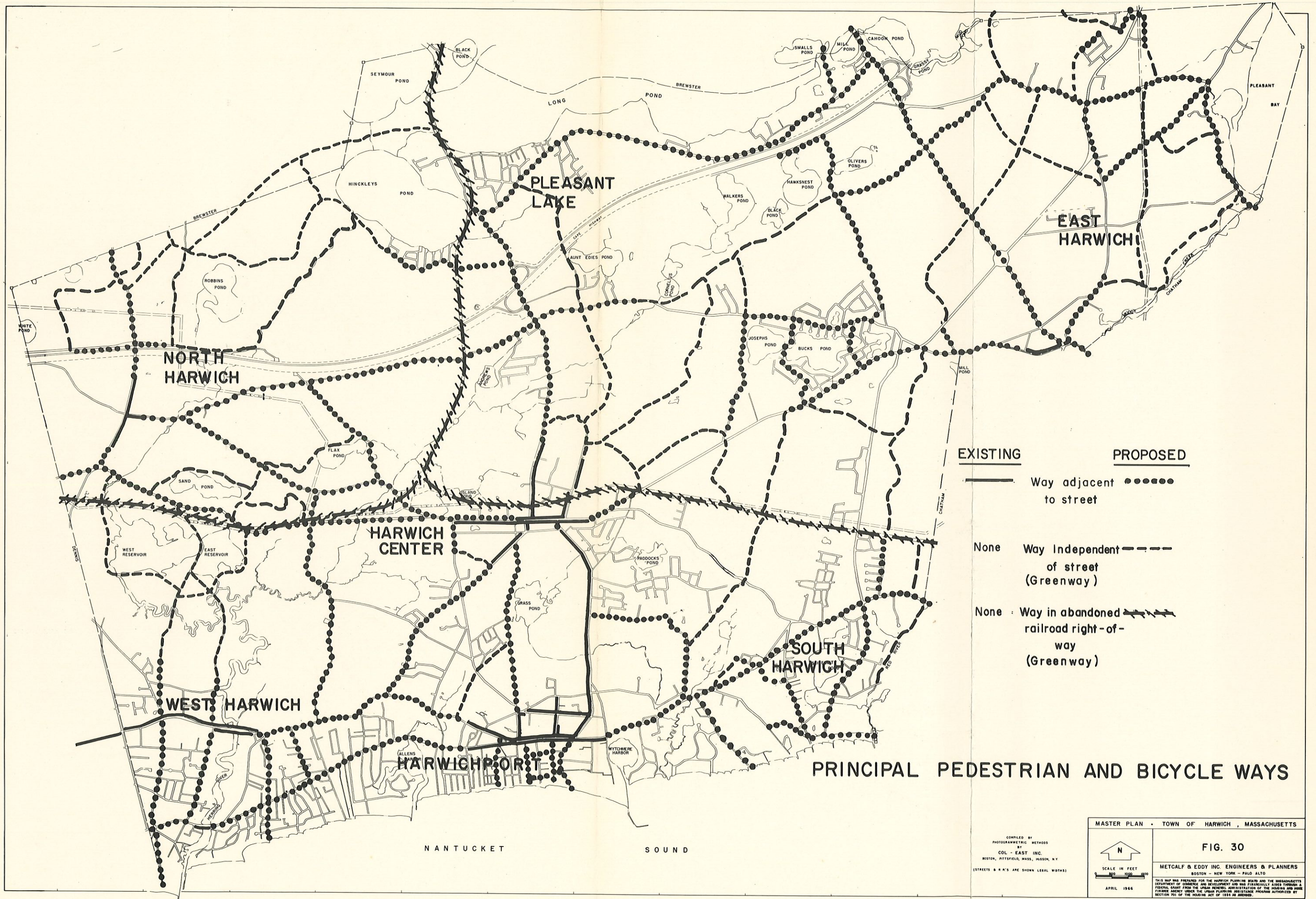
Fig. 30 indicates existing pedestrian and bicycle ways. The only extensive system is along abandoned railroad rights-of-way. Because of improper location for service to the majority of summer walkers going to and from the beaches, and in some areas closeness to cranberry bogs and their hazardous chemical sprays, the existing system is totally inadequate. The sidewalk along Bank Street should be well used, but it has the deficiency of being only a paved berm for part of its length between Harwichport and Harwich Center.

A plan for a major system of pedestrian and bicycle ways also is shown on Fig. 30. This plan relies upon a combination of sidewalks along highways and streets and off-street trails and parks. The objective is to provide safe, convenient ways connecting residential areas with beaches, other recreational facilities, and activity centers.

Parking

Waterfront Areas. The adequacy of parking spaces at town beaches is related more to problems of rationing the scarce commodity (the beaches) than to the existing or potential demand for such spaces. On the grounds that residents and guests who can walk to the beach deserve protection against overcrowding caused by outsiders attracted by available parking spaces, a good case can be made for not providing as many spaces as might be used on a peak summer day.



*These phrases are used to cover sidewalks, walkways, paths, and trails. In the Recreation and Conservation Plan ways outside of street right-of-ways are called "greenways."



- | | |
|-----------------|---|
| EXISTING | PROPOSED |
| — | ●●●●● |
| None | Way adjacent to street |
| --- | Way Independent of street (Greenway) |
| None | Way in abandoned railroad right-of-way (Greenway) |

PRINCIPAL PEDESTRIAN AND BICYCLE WAYS

COMPILED BY
 PHOTOGRAMMETRIC METHODS
 BY
 COL - EAST INC.
 BOSTON, PITTSFIELD, MASS., HOUSON, N.Y.
 (STREETS & R.R.'S ARE SHOWN LEGAL WIDTHS)

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS	
 SCALE IN FEET  APRIL 1966	FIG. 30 METCALF & EDDY INC. ENGINEERS & PLANNERS BOSTON - NEW YORK - PALO ALTO <small>THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE BRIDGESBOROUGH DEPARTMENT OF CONSERVATION AND DEVELOPMENT AND WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN REDEVELOPMENT ADMINISTRATION OF THE HOUSING AND URBAN FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.</small>

It is recommended that parking problems in water-front areas be solved principally through the provision of the pedestrian ways shown on Fig. 30.

Harwichport and Other Village Centers. The most important commercial development in Harwich is in Harwichport along Route 28. From the 4th of July to Labor Day, parking space is usually available within 400 ft. of the driver's destination. Persons attending the evening performance at the theater in Harwichport may have difficulty finding a parking space within this distance. However, this is not the same as a general shortage of parking spaces which affects all businesses in a commercial district.

Recommendations. In Harwichport the town has already provided a large off-street parking area. Considering these factors, it is suggested that the Town of Harwich should not feel obligated to provide additional off-street parking for businesses at public expense. It is recommended that the town cooperate with any businessmen who wish to improve or enlarge their off-street parking facilities, insofar as such a proposal involves the street, and utilities within the public right-of-way. Recommended planning standards for off-street parking and loading are shown in Tables 35 and 36.

Table 35. Recommended Off-Street Parking Standards

Use	Number of parking spaces per unit
Dwelling	Two per unit
Roadside stand	Ten spaces
Lodging house, motel or hotel	One and one-half per rental unit
Retail, service, finance, insurance or real estate establishment	One per each 75 sq. ft. of floor space
Wholesale establishment	One per each 300 sq. ft. of floor space
Manufacturing or industrial	One per each 600 sq. ft. of floor space
Auditorium, church, or other place of public assembly	One for each 300 sq. ft. floor space

Table 35. Recommended Off-Street Parking Standards cont.

Use	Number of parking spaces per unit
Hospital or nursing home	Two per bed at design capacity
School or college	Two per classroom in an elementary and junior high school and four per classroom in a senior high school plus spaces needed for auditorium or gymnasium whichever has the larger capacity
Other community facility (town building, recreation, etc.) or public utility	Dependent on individual needs but not less than one per each 300 sq. ft. of floor space
Lumber yard or similar establishment	One per each 75 sq. ft. of retail sales area
Contractor's yard, heavy equipment sales or rental, cesspool service establishment, etc.	One per each 600 sq. ft. of heavy equipment parking area

Source: Metcalf & Eddy, Inc.

Table 36. Recommended Off-Street Loading Standards

Use	Number of loading spaces per unit
Business, industrial community facility (school, church, town building, recreation, etc.) or public utility establishment with over 5,000 sq. ft. of floor space	One per 15,000 sq. ft. or fraction thereof of floor space

Source: Metcalf & Eddy, Inc.

COMMUNITY FACILITIES

Schools

Characteristics and Background. The Town of Harwich presently operates its public schools on a K4-2-2-4* grade-level system, i.e., kindergarten and Grades 1 through 4 in the elementary school; Grades 5 and 6 in the intermediate school; Grades 7 and 8 in their own building, separate from the senior high school; and Grades 9 through 12 administered as the senior high school. (See Fig. 31 for location of these schools.) The junior and senior high schools share the campus-type group of buildings on Oak Street. The seventh and eighth grades occupy one building and the ninth through twelfth grades occupy two buildings. Gymnasium, auditorium, and cafeteria are shared.

Harwich is a member of Joint Supervisory Union No. 16 and shares with Chatham a school superintendent and his office staff, and a few educational specialists, including counsellors and speech therapists. Without this arrangement, it would be difficult for a small school district such as Harwich to employ these specialists.

In the past there have been attempts to include Harwich in one or another proposal for a regional high school, but without success. At the present time Harwich's best opportunity for consolidation is with Chatham. However, the consolidation with Chatham has been attempted three times, and defeated by vote in Chatham each time. There is little likelihood that a consolidation could be accomplished at the present time, in the opinion of those closest to the situation. The attitudes toward consolidation in the two towns are indicated by the fact that Harwich is willing to pay \$880 per year per pupil in Grades 9-12, compared to about \$550 per year per pupil in large high schools (1,000 to 3,000 pupils) which offer a full range of educational opportunities. Chatham is spending about \$940 per year per pupil in Grades 9-12. Dennis is consolidated with Yarmouth, and Brewster is about to join the Eastham-Orleans-Wellfleet Regional School District.

*The State Department of Education calls it a 6-2-4 system in its Annual Report for the Year Ending June 30, 1965 (ignoring the kindergarten). This is correct administratively, but physically K4-2-2-4 is more descriptive.

In 1965 Holy Trinity School in West Harwich became the first parochial school to be established in Harwich. For that year, the parochial school taught Grades 1-4, with the intent of adding a grade each year until the school teaches Grades 1-8. Total enrollment in March 3, 1967, was 187 in Grades 1-5, of which 72 students were from Harwich. Students are mostly from Harwich, Dennis, Yarmouth, and Hyannis.

Inventory. The major physical features of the existing public schools, both sites and buildings, in Harwich are presented in Table 37.

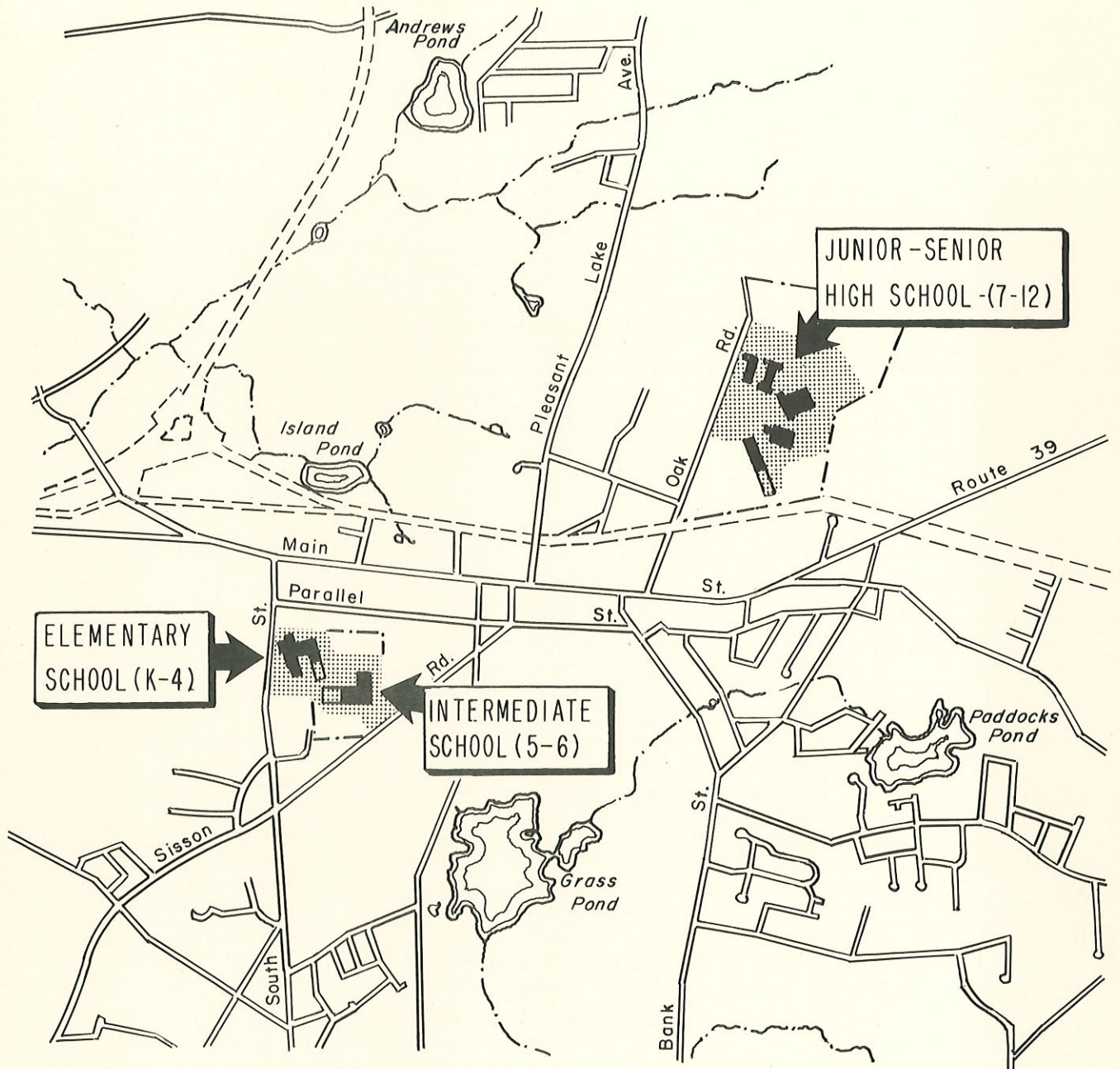
Table 37. Inventory of Public School Data



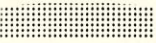

School	House grades	Year built	Const. mat.	Hght. stor.	Tch. spac.	Spec. cl. rms.	Ext. site size ac.	Site exp. poss.
Elem.	K-4	1952 (1956 add.)	Conc.& mason.	1	21	Comb. audi. gym	8+	Good
Inter.	5-6	1936	Conc.& mason.	2	13	Comb. audi. gym	10+	Poor
Jr.-sr.	7-8 9-12	1963	Conc.& mason.	1	32	Audi. & gym lang. lab.	50+	Good

Source: Supt. of Schools and Field Survey by Metcalf & Eddy, Inc.

Enrollments. Enrollment figures for Harwich have shown a moderate but steady increase for the past few years. Table 38 shows enrollment increases between 1955-56 and 1965-66.

As part of any enrollment projection, those factors such as births, deaths, migration of families both in and out of town, and the general age composition of the town residents, which affect the school population, must be considered.



-  Existing Building
-  New Building or Addition
-  Existing Property
-  Proposed Property Line

MASTER PLAN

TOWN OF HARWICH

MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

PUBLIC SCHOOLS

METCALF & BEDDY, INC. ENGINEERS & PLANNERS • BOSTON • NEW YORK • PALO ALTO

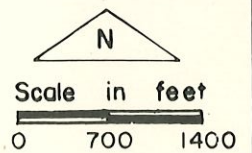


Table 38. Past School Enrollment Increases
by Grade Levels

Year	Grade levels					Special students	K-12
	K-4	5-6	7-8	9-12			
1955-56	322	106	106	124		6	664
1965-66 ⁽¹⁾	<u>464</u>	<u>161</u>	<u>151</u>	<u>240</u>		<u>23</u>	<u>1,039</u>
Total increase in pupils	142	55	45	116		17	375
Average number of increase per year	14.2	5.5	4.5	11.6		1.7	37.5
Total ten-year percentage increase	44.1	51.9	42.5	93.5		283.3	56.5

1. Enrollments for 1965-66 include parochial school pupils who live in Harwich (53, grades K-4) for purposes of comparison.

Source: Enrollments from Supt. of Schools.

Table 39 compares births and first grade enrollments six years later. It can be seen that an increase usually occurs. This indicates that Harwich has a net in-migration of families with preschool children. This trend is expected to continue.

It can also be seen in Table 39 that the number of resident births in Harwich per year has not increased significantly over the past 10 years. This means a declining birth rate, as the total population of Harwich has increased by 43.5 percent during the same period. This trend is expected to continue into the 1970's, with a reversal about 1975, when the children of parents born between 1945 and 1950 begin entering the public school system.

School enrollment as a percentage of total population indicates the relative youthfulness of the local population. A sampling of selected towns in Massachusetts, based on 1960 U. S. Census information, indicates that this statistic is usually at the level of 20 to 25 percent, in towns of about the same population as Harwich. Since Harwich has an unusually high percentage of older persons, due to its advantages for retirement, it is to be expected that this figure would be somewhat lower than the typical levels.

Table 39. Increase in Number of Children Between Birth and Year of School Entrance(1)

Birth year	Number of births	Number of entering first graders six years later ⁽²⁾	Increase over births six years earlier
1956	71	78	+7
1957	87	83	-4
1958	89	99	+10
1959	69	89	+20
1960	72	90	+18
1961	84		
1962	73		
1963	90		
1964	70		
1965	70(est.)		

1. Births (allocated). Child listed if born to a town resident regardless of where birth occurred.
2. Includes both public and parochical school enrollments for 1965 and 1966 and does not include those repeating first grade which was estimated at 12 percent of total by principal.

Sources: Vital Statistics, Mass. Dept. of Education; Harwich Supt. of Schools; and Harwich Town Reports.

Total school enrollment projections are compared to total population projections in Table 40. It can be seen that even with a shift in age composition toward an older populace, total school enrollments (including both public and parochial) are expected to increase only by about 800 students between 1965 and 1980.

Table 40. School Enrollments Versus Population

Year	Population	Enrollment ⁽¹⁾	Percent
1955	3,367	664	19.7
1960	3,747	869	23.2
1965	4,830	1,039	21.5
1970	5,800	1,280	20.7
1975	7,600	1,480	19.6
1980	9,400	1,845	19.7

1. Includes parochical school.

Source: Projections by Metcalf & Eddy, Inc.

It is assumed that between 1967 and 1970 there will be no notable influx of young families with preschool children moving into Harwich.

An enrollment forecast has been prepared for Harwich public schools by the existing four grade levels (see Table 41). This forecast was prepared on the basis of known births to Harwich residents and projected in-migration to give first grade enrollments to 1970. A percentage of persistence from grade-to-grade and year-to-year was developed on the basis of past Harwich enrollments. Those students attending the Harwich Holy Trinity School, a parochial school, which opened in Harwich for the first time in the 1965-66 school year, were subtracted from the projections. On the basis of past experience, the parochial school enrollment should average 15-20 Harwich students per class per year in Grades 1-4.

In addition, these figures are based on the projection of population to 1980 by age-group, as presented in Table 17. The population projection assumes that the pattern of in-migration will become more similar to that presently noted in Upper Cape towns. In-migration is seen as a growing pressure which will roll down the Cape like a wave, reaching Harwich in the 1970's. The elementary grades should be the first to show the effects of this, as indicated by a projected growth of 150 students in Grades K-4 between 1975 and 1980. This represents a five year increase of 29 percent.

Table 41. Estimated Future Public School Enrollments by Grade Levels (1)

School year	Grade levels					Total enrollment
	Elementary K-4	Inter-mediate 5-6	Junior high 7-8	Senior high 9-12	Special class	
1966-67	423	161	147	244	20	995
1967-68	433	152	166	259	23	1,033
1968-69	443	172	166	275	23	1,079
1969-70	460	180	170	280	24	1,114
1970-71	470	185	180	300	25	1,160
1975-76	525	210	200	375	30	1,340
1980-81	675	250	250	475	35	1,685

1. Does not include parochial school students, estimated to amount to about 120-160 students in Grades 1-8 in future years.

Source: Projections by Metcalf & Eddy, Inc.

Adequacy. The quality of the physical plant in the Harwich School System was evaluated under five major headings with numerous subheadings.* These were rated numerically as indicated in Table 38. The headings and subheadings were as follows:

1. Site. Its accessibility for pupils, environment, size, form, elevations, nature of soil and drainage, and improvements made.
2. Building. Its placement on the site, flexibility as to design, type of construction material used, form and architecture, foundation, height, and walls, floors, and roof, entrances and exits, condition and appearance, acoustics, fenestration, stairways, corridors, and lobbys, basement areas, and attics.
3. Service Systems. Heating and ventilating, sewer systems, fire protection, electrical systems, clocks and bells, fire alarm systems, telephone, public address, and other service systems.
4. Classrooms - Regular and Special. Size and number, shape and location, natural light and light control, floors, walls, ceilings, doors, color schemes, chalk boards, tack boards, shop, science and home economics laboratories, kindergartens, and other special classrooms.
5. Special Rooms. Gymnasiums, auditoriums, multipurpose rooms, cafeteria, faculty rooms, health suites and administrative offices.

The total possible score for each school is 1,000. This score is seldom, if ever, attained. The total score is translated by the evaluator in the descriptive categories as follows:

850-1,000 - Excellent. Few or no improvements needed.

*Source: Ralph D. McLeary, Guide for Evaluating School Buildings (Cambridge, New England Development Council, 1952) (52 page pamphlet).

650-849 - Good. Certain desirable facilities are completely lacking or inadequate; such a building can often be made into an excellent one without an undue expenditure of money.

500-649 - Fair. Deficiencies are more numerous but can be corrected.

400-499 - Poor. Inadequate and lacking in most of the features of a modern school.

Below 400 - Unsatisfactory. The building should be abandoned at the earliest possible date.

In Table 42, the Harwich Elementary School is evaluated as "Good," the Intermediate School as "Fair," and the Junior-Senior High School as "Excellent."

Table 42. Evaluation of Public Schools

School	Site	Building	Service systems	Class-rooms	Special rooms	Total
Elementary	60	140	190	280	140	810
Intermediate	60	100	120	240	110	630
Junior and senior High	95	150	200	300	150	895
Possible scores	120	170	225	315	170	1,000

Source: Field survey by Metcalf & Eddy, Inc.

From the inventory forms, apparent deficiencies exist in the Elementary School in the older (1952) three-story section. Building settlement has caused cracks and water damage to interior walls. The kitchen is in need of updating, especially the gas appliances, lights and metal counters.

Certain deficiencies also exist in the Intermediate School. Flooring materials are worn. The science and home economics laboratories are very inadequate for present day requirements. The mechanical equipment is old and difficult to repair when broken. The outside slope from the rear service area up to the playfield needs immediate attention for erosion control.

The new Junior-Senior High School is deserving of special recognition. There are five buildings, arranged along a curving driveway, all connected by enclosed walkways. There are two class and laboratory buildings for high school level work only. These are separated from the junior high school class-laboratory building by the two dominant structures of the group. These are the gymnasium and the auditorium-cafeteris building. Expansion of this building grouping system would be possible at the junior high school end, where another building, duplicating the existing junior high school building, could be built in what is now a parking area.

Space Requirements and Utilization. Harwich schools are in a very good position regarding classroom space. Presently each school has classrooms that are either not used for instructional purposes or used only occasionally, i.e., two or three times each week.

The Elementary School could accommodate 500 pupils at 25 pupils per space or 600 at 30 pupils per space. In 1965-66 enrollment was 411 or 82 percent of capacity at 25 pupils per space and only 69 percent of capacity at 30 pupils per space. The Intermediate School could accommodate 220 students at 20 students per space or 275 at 25 pupils per space. In 1965-66 enrollment was 161 or 73 percent of capacity at 20 pupils per space and 59 percent at 25 pupils per space. The Junior-Senior High could accommodate 520 pupils at 20 pupils per space or 650 at 25 pupils per space. In 1965-66 enrollment was 391 or 72 percent of capacity at 20 pupils per space and 58 percent at 25 pupils per space. These figures indicate that presently no classroom construction crisis exists in Harwich. In a following section projected enrollments will indicate what provisions shall be made in the future for additional classrooms.

Future Teaching Space Needs. With the information from the enrollment projections and the building surveys the enrollment capacity for each existing school was developed and is tabulated in Table 43 which follows.

Harwich public schools presently have 66 teaching spaces available for use, three of which are used for special education classes. At the elementary level there are, in Grades K-4, 20 spaces available; at the intermediate level, in Grades 5 and 6, 13 spaces available; and at the secondary level, in Grades 7-12, 32 spaces available.

Table 43. Estimated Future Public School Space Needs

School year	Actual or projected enrollment (1)	Deficient (-) or surplus	Deficient (-) or surplus
		enroll. cap.	space capacity
Grades K-4			
at start	21 $\frac{-1}{20}$	spaces special class	at 25 pupils per space (500)
			at 25 pupils per space (20)
1966-67	423	+77	+3
1967-68	433	+67	+2
1968-69	443	+57	+2
1969-70	460	+40	+1
1970-71	470	+30	+1
1975-76	525	-25	-1
1980-81	675	-175	-7
Grades 5-6			
at start	13 $\frac{-2}{11}$	spaces (80% of cap.)	at 20 pupils per space (220)
			at 20 pupils per space (11)
1966-67	161	+59	+3
1967-68	152	+68	+3
1968-69	172	+48	+2
1969-70	180	+40	+1
1970-71	185	+35	+1
1975-76	210	+10	-1
1980-81	250	-30	-2
Grades 7-8			
at start	11 $\frac{-2}{9}$	spaces (80% of cap.)	at 20 pupils per space (180)
			at 20 pupils per space (9)
1966-67	147	+33	+1
1967-68	166	+14	0
1968-69	166	+14	0
1969-70	170	+10	0
1970-71	180	0	0
1975-76	200	-20	-1
1980-81	250	-70	-4
Grades 9-12			
at start	21 $\frac{-4}{17}$	spaces (80% of cap.)	at 20 pupils per space (340)
			at 20 pupils per space

Table 43. Estimated Future Public School Space Needs cont.

School year	Actual or projected enrollment ⁽¹⁾	Deficient (-) or surplus enroll. cap.	Deficient (-) or surplus space capacity
1966-67	244	+96	+5
1967-68	259	+81	+4
1968-69	275	+65	+3
1969-70	280	+60	+3
1970-71	300	+40	+2
1975-76	375	-35	-2
1980-81	475	-135	-7

1. Figures do not include parochical students.

Sources: Mass. Dept. of Education.
Projections by Metcalf & Eddy, Inc.

Elementary Grades (K-4) are assigned 25 pupils per space at the desirable standard. This standard usually applies through Grade 6 but housing Grades 5 and 6 in the old high school makes smaller class sizes more reasonable. Therefore, the intermediate school Grades (5-6) as well as the junior high school Grades (7-8), and senior high school Grades (9-12) are assigned 20 pupils per teaching space as the desired standard. The total number of teaching spaces in each school has been adjusted to incorporate the usage that is practical, considering scheduling the wide variety of courses offered and the special rooms required for modern teaching techniques. Elementary schools generally can schedule one class per room per period per day or at a 100 percent utilization factor. However, secondary schools have rooms that are only able to be scheduled for use three or four times per day; therefore, the effective and desired utilization factor in a secondary school is about 80 percent.

The new junior-senior high school appears to have barely enough capacity for the expected 1975-76 enrollment. The intermediate school, Grades 5 and 6 in the old high school, also is expected to experience a mild space squeeze about 1975. The elementary school (K-4) is expected to be more seriously crowded, but only after 1975. Enrollment projections, then, do not indicate the need for the town meeting approval of the design of new school structures before 1970 or three years prior to opening.

School Planning Standards. In all school planning the prime concern should be the educational situation of the student. The standards for physical facilities should be related to educational policies. The following policies and planning standards are recommended:

1. Physical separation of age-levels is desirable, and this need not be in conflict with the use of expensive facilities, such as the gymnasium, by different age-levels.
2. The existing two-campus arrangement can and should be continued into the future.*
3. Minimum site size standards:

Elementary schools: 5 acres plus 1 acre
(Grades K-6) per 100 students, a
minimum of 10 acres

Secondary schools: 10 acres plus 1 acre
per 100 students, a
minimum of 20 acres
4. Schools should be able to be combined with other appropriate civic uses, such as youth recreation activities, adult education, and general community uses.
5. Schools should have core facilities for the projected maximum enrollment constructed in the initial facility.

Recommendations. Fig. 31 illustrates graphically the following major recommendations and serves as the proposed school facilities plan:

Policy. The two campus school system should be continued and, when extensions or new buildings are needed, they should be built on either the existing elementary or high school campus.

*These school planning standards assume a major dependence upon the bussing of students and, therefore, no walking standard is presented. It is expected, however, that those students within the required minimum radius established by the Mass. Dept. of Education still will walk to school.

Elementary (Grades K-6).

1. Before 1972, the older part of the existing intermediate school should be renovated and modernized.
2. Before 1975, the existing campus should be enlarged by about five acres and another building (10 to 12 classrooms) should be erected on this site extension. Classes could be divided so that three buildings could serve the lower, middle, and upper elementary Grades (K-2, 3-4, and 5-6).

High School (Grades K-6).

Before 1975, 6 to 10 teaching spaces should be added to the existing junior-senior high school.

Recreation and Conservation

Definitions. For the purposes of this report, public recreation and conservation facilities are those operated by a governmental agency or other nonprofit association with or without the payment of a fee. Private facilities are those operated by a private concern primarily for the making of a profit.

The definitions used to guide the study and evaluation of public recreation facilities in Harwich are listed below. These are substantially in agreement with those recommended by the National Recreation Association.

Outdoor Facilities

1. Playground - for children aged 6-12, providing for open field games, paved areas for court games, softball and Little League field, play apparatus such as swings, slides, etc.
2. Playfield - primarily for children aged 12-18, but also for adults, providing for team games on grassed areas, such as baseball, softball, soccer, track field hockey, archery, drill team, etc., and on paved areas, such as tennis, basketball, handball, etc. A large off-street parking area is necessary.

3. Park - for family groups and individuals of all ages, providing for essentially passive recreation, including such facilities as trees, grassed areas, benches, walks, etc. An off-street parking area is necessary.
4. Reservation (large park) - for family groups and individuals of all ages, providing for both active and passive recreation including such facilities as those found in a park, playground, and playfield. A large off-street parkway area is desirable.
5. Town forest - for family groups and individuals of all ages, providing for both active and passive recreation, including such facilities as camping area, picnic area, hiking trails, bridle paths, wildlife sanctuary, boating, fishing, etc.
6. Beach (salt or fresh water) - for family groups and individuals of all ages, including such facilities as sanitary facilities, bathhouse, tot lot, picnic area, and off-street parking area and served by a lifeguard.
7. Boating (salt or fresh water) - for family groups and individuals of all ages, including such facilities as boat rental, charter, marine services, anchorage, dock and launching ramp.
8. Golf course - for family groups and individuals of all ages, including such facilities as clubhouse, regulation golf course, practice putting area, driving range, and parking area.
9. Greenway - linear parks emphasizing movement, including such facilities as pedestrian paths, bridle trails, and bicycle paths.
10. Conservation and other open space - natural areas whose primary purpose is the protection of flora and fauna and the preservation of the landscape.

Indoor Facilities

1. Indoor swimming pool - a highly desirable public facility to provide exercise during the winter months. A pool suitable for competition swimming and diving is desirable, because it would then fit into the high-school physical education program, offer an addition to the community sports program, and make swimming events and exhibitions possible year-round, as well as being used for recreational swimming.
2. Ice skating rink - for family groups and individuals of all ages. This could be a key element in a winter sports and recreation program on Cape Cod.
3. Recreation center - for family groups and individuals of all ages, including such facilities as gymnasium, auditorium, and specialized library. Provision can be made for participation in arts and crafts, indoor games, movies, etc.

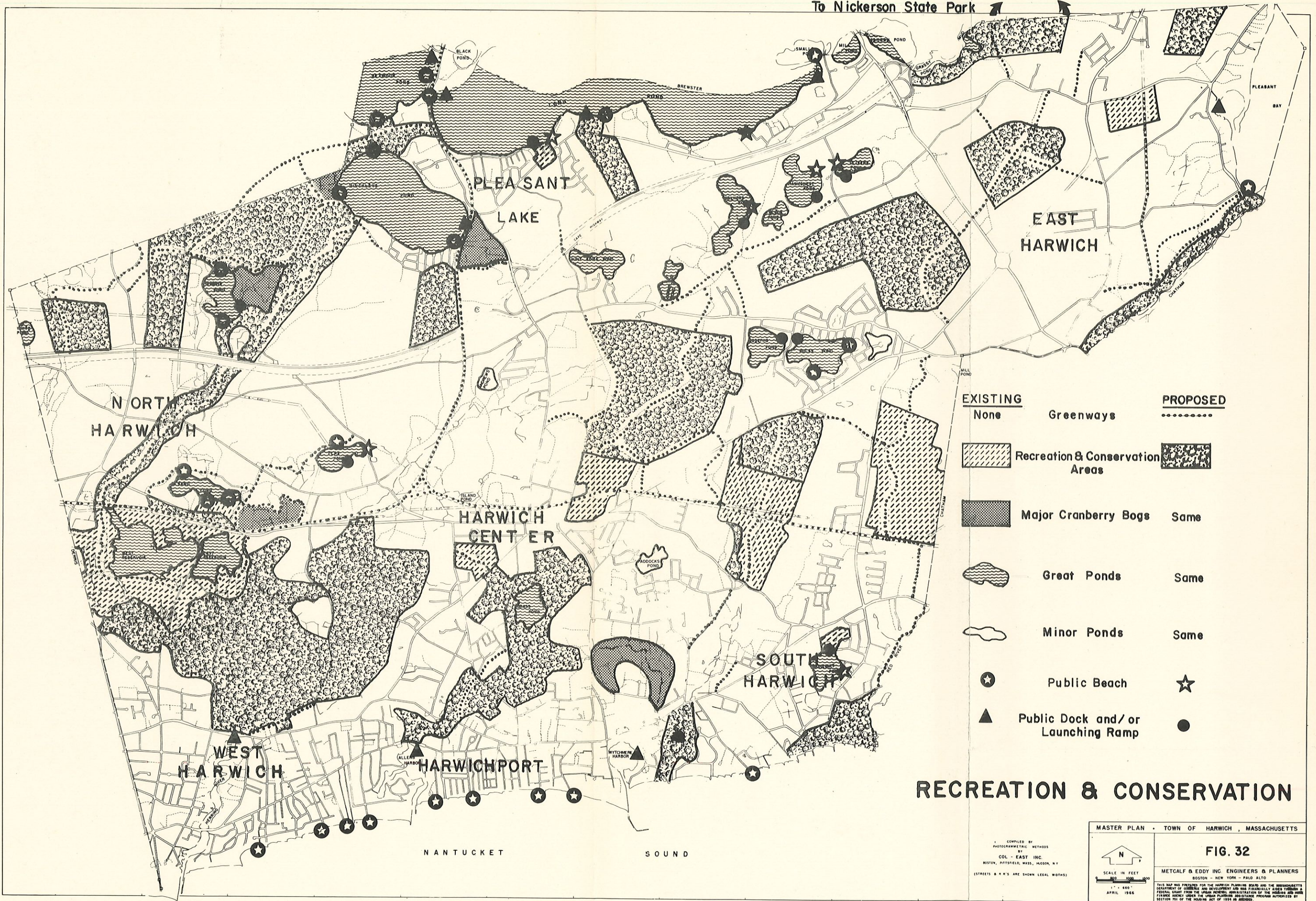
Inventory. Tables 44 and 45 present an inventory of existing public recreation and conservation facilities. The location of these facilities is shown on Fig. 32 and 33.

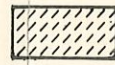

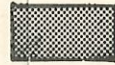

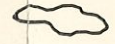


Existing Program. The Parks Department and Recreation Commission both sponsor various portions of a recreation program during the summer months. There is no publicly-sponsored program during the fall, winter, and spring months.

Table 44. Inventory of Public Outdoor Recreation and Conservation Facilities

<u>Facility</u>	<u>Space ac. (1)</u>	<u>Development</u>
<u>Playground</u>		
Elem.-inter. sch.	18.0	2 basketball courts, large pkg. area, swings, climbing gym and large grassed area

To Nickerson State Park



EXISTING		PROPOSED	
None	Greenways	
	Recreation & Conservation Areas		
	Major Cranberry Bogs	Same	
	Great Ponds	Same	
	Minor Ponds	Same	
	Public Beach	☆	
	Public Dock and/or Launching Ramp	●	

RECREATION & CONSERVATION

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS

FIG. 32

METCALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALO ALTO

1" = 400'
APRIL, 1966

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF CONSERVATION AND DEVELOPMENT AND IS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN FEDERAL ADMINISTRATION OF THE HOUSING AND URBAN FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1949 AS AMENDED.

1. COMPILED BY
PHOTODUPLICATION METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.
(STREETS & R.R.'S ARE SHOWN LEGAL WIDTHS)

Table 44. Inventory of Public Outdoor
Recreation and Conservation Facilities cont.

Facility	Space ac.(1)	Development
<u>Playfield</u> High school	49.6	Football and field hockey field, softball field, large open grassed area, Little League field, 2 basketball courts, and 2 large parking areas
<u>Park</u> Brooks	18.0	Baseball field with bleachers, 2 tennis courts, 2 shuffleboard courts, picnic area (10 tables), bandstand, and maintenance bldg.
<u>Town forest</u> Depot Rd.	170.0	None
<u>Reservation</u> None	-	-
<u>Salt water beach</u> Red River	20.0-2,267	Lifeguard, sanitary facil. and 250 pkg. spaces
Neel Rd.	0.3-33	6 parking spaces
Bank St.	2.3-327	Lifeguard, sanitary facil. and 75 parking spaces
Sea St.	0.3-33	None
Campgrounds	2.3-1,010	10 parking spaces
Wah-Wah-Taysee Rd.	0.3-30	None
Brooks Rd.	0.3-40	6 parking spaces
Earle Road	1.0-175	50 parking spaces & lifeguard
Gray Neck Rd.	0.3-40	6 parking spaces
Pleasant Rd.	1.5-181	Lifeguard & 75 parking spaces
Pleasant Bay	0.5-200	6 parking spaces

Table 44. Inventory of Public Outdoor Recreation and Conservation Facilities cont.

Facility	Space ac. (1)	Development
<u>Fresh water beach</u>		
Bucks & Josephs Ponds	2.5	Boat launching ramp
Sand Pond	10.0	Dock and parking area
Long Pond	9.0	Boat launching ramp and 2 picnic tables
<u>Salt water boating</u> (2)		
Wychmere Harbor	0.5	Landing deck, anchor- age and marine services
Allen's Harbor	0.1	Landing dock, anchorage and marine services
Round Cove	0.1	Landing dock
<u>Fresh water boating</u>		
Long Pond	0.1	Launching ramp
Sand Pond	0.1	Landing dock
<u>Golf course</u>		
None(3)	-	-
<u>Greenway</u>		
None(4)		
<u>Conservation & other open space</u>		
Herring River	225±	None
Water Dept. land	150±	None
Totals	664.1±	4,336± None

1. For beaches, second figure is feet of beach frontage.
2. The Andrews River combined anchorage and marine (provision for 153 boats) and containing approximately 18 acres is under construction jointly by the U.S. Army Corps of Engineers and the town. At the same time, the Corps under preparation a plan for navigation improvements on Pleasant Bay.
3. The 9-hole Harwich Golf Course, while open to the general public, is privately-owned and operated as a profit making enterprise.
4. Northern portion of N.Y., N.H.&H. R.R. right-of-way between Route 6 and Brewster town line in process of acquisition by the town.

Sources: Harwich assessor's maps and field survey by Metcalf & Eddy, Inc.

Table 45. Inventory of Public Indoor Recreation Facilities

Facility	Site space (ac.)	Floor space (sq.ft.)	Development
<u>Swimming pool</u>			
None	-	-	-
<u>Ice skating rink</u>			
None	-	-	-
<u>Recreation center</u>			
Recreation bldg.	1.00+	4,600	Rms. for arts & crafts meetings.
Jr. theater	0.27	6,000	Workshops for children
Total	1.27+	10,600+	

Source: Harwich assessor's maps and field survey by Metcalf & Eddy, Inc.

Present and Future Requirements. Table 46 contains the standards for conservation and recreation facilities as recommended by the National Recreation Association and adjusted to meet the individual needs of Harwich.

Where practical, conservation areas should be maintained as multi-use areas for hunting, fishing, camping, hiking, bird watching, nature trails, etc. All available wetlands in Harwich ultimately should be conserved and protected by a governmental agency and/or a nonprofit organization.

Conservation and recreation facilities should be provided for persons of all ages, for all seasons and for both active (sports, etc.) and passive (parks, card playing, etc.) activities.

Adequacy. The number and size of existing playground, playfield, and park facilities are inadequate for present, let alone future requirements.

The adequacy of public salt water beaches is the greatest problem. This is also where there is the greatest demand for recreational facilities. Most of these town-owned beaches are small (under 200 ft. along the water) and lack basic facilities such as toilets, bathhouses and parking areas. Only 18.7 percent (4,136 ft.) of the available 22,100 ft. of beach along Nantucket Sound is publicly-owned.

Table 46. Recommended Conservation and Recreation Facilities Standards

Facility	Basis of number	Site or facility size
<u>Outdoor</u>		
Playground	1 per elementary school 1 per each village	1-5 ac.
Playfield	1 per secondary school 1 per each village	3-10 ac.
Park	1 per village where average lot size is 20,000 sq.ft. or under	1/2-5 ac.
Town forest	1 per town	over 50 ac.
Reservation	1 per town	over 25 ac.
Beach (salt or fresh water)	1 per pond over 2 ac. in size 1 ft. of salt or fresh beach per person in peak summer	3-10 ac. Over 200 ft. of water frontage
Boating (salt or fresh water)	1 per harbor 1 per pond over 20 ac. in size per each navigable river	3-10 ac.
Golf course	9 holes per 5,000 summer residents	200 ac./18 holes
Greenway	System connecting all ponds, beaches, conservation areas and other recreation facilities.	Minimum width 10 ft. under restrictive conditions - desirable width 30-100 ft.
Conservation and other open space	All available wetlands over 5 ac. in size	Over 1 ac.
<u>Indoor</u>		
Indoor swimming pool	1 per 25,000 year-round population	1-5 ac. site
Ice skating rink	1 per 25,000 year-round population	1-5 ac. site

Table 46. Recommended Conservation and Recreation Facilities Standards cont.

Facility	Basis of number	Site or facility size
Recreation center	1 per town	1-5 ac. site 7,500 sq.ft. of floor space
Golden age center	1 per 1,000 retired persons	1 ac. site 10,000 sq.ft. of floor space
Summer playhouse (theater)	1 per 10,000 seasonal pop.	5 ac. site 10,000 sq.ft. of floor space

Source: National Recreation Association Standards adjusted by Metcalf & Eddy, Inc., to meet the individual needs of Harwich.

Owing to conflicts with adjacent private beaches and high cost involved in acquiring salt-water beach frontage, it appears greater emphasis should be placed on the public development of fresh water beaches. The opportunity for developing fresh water beaches is relatively untapped.

The same is true for fresh water boating areas. In contrast it appears that the most has been made of creating at least one public boat facility in each salt water harbor.

The present nine hole private course is poorly designed and almost completely inadequate in its ability to meet golfing demands.

Considering the opportunity for creating additional greenways, and conservation and other open space and the importance of protecting Harwich's unique natural environment, present areas are totally inadequate in number and size.

Harwich needs a larger indoor recreation center and also a separate "Golden Age" center for retired persons. The present recreation building is too small.

The present summer theater is too small, and the site is totally inadequate and poorly located.

Coordination. A basic need in Harwich is for all agencies and individuals directly or indirectly concerned with recreation and conservation to get together and work out a program of goals, policies, and proposed actions for the development of recreation and conservation in Harwich. The material presented here should be a useful basis for further planning.

The public agencies with direct responsibility for recreation areas are the Park Commissioners, the Trustees of Brooks Free Library, the Recreation Commission, the Waterways Study Committee, the Beach Committee, the Conservation Commission, the School Committee, and the Historical Commission. Other officials who should be closely involved in recreation and conservation planning are the Selectmen and the Planning Board. Other public officials with special interests who should be consulted include the Tree Warden, the Water Commissioners (because of recreation and conservation potential of watershed reservations), the Finance Committee, the Moth Superintendent, the Shellfish Warden, the Herring Supervisor, the Harbor-master, and the Propagation of Fish and Game Committee.

The Conservation and Recreation Plan for Harwich must be more than a collection of unrelated facilities, for because of the special importance of the Cape Cod landscape, this Conservation and Recreation Plan is a major basis for the physical plan for the future town. It is necessary to consider how all these recreation and conservation elements should fit together, and to what purpose.

Recommendations. Fig. 32 illustrates graphically the following major recommendations and serves as the proposed recreation and conservation plan.

Outdoor Facilities

Policy. Future emphasis should be placed on inland fresh water facilities in contrast to beach salt water facilities.

Playground. Five additional areas should be set aside - one each in West Harwich, Harwichport, East Harwich, Pleasant Lake and South Harwich.

Playfield. An additional combined baseball-softball ball field with lights behind the high schools is in the planning stage. An open grassed area for use as a combined football-baseball-softball field plus a hard topped basketball court should be developed in each village, except Harwich Center.

Park. Three additional small parks should be set aside - one each in West Harwich, Harwichport, and South Harwich.

Town Forest. No additional area is recommended.

Reservation. A large area adjacent to Grass Pond should be developed. Two additional areas should be considered, one adjacent to the Brewster town line east of Grassy and Mud Ponds, and the other, adjacent to Chatham east of Depot Road. Both considerations agree with actions of the two adjacent towns (see Fig. 32).

Salt Water Beach. No additional public salt water beaches are recommended.

Fresh Water Beach. Such a beach is recommended for each Great Pond.

Salt Water Boating. No additional salt water boating areas than those in process (Andrews River and Pleasant Bay) are recommended.

Fresh Water Boating. In combination with a fresh water beach for each Great Pond, a boat landing is recommended.

Golf Course. A new 18 hole public golf course just north of Harwich Center is in the planning stage. We support wholeheartedly this proposal.

Greenway. A system of greenways is recommended for the area generally north of Great Western and Chatham Roads. These should be considered in collaboration with the recommended pedestrian ways shown on Fig. 30.

Conservation and Other Open Space. All existing wetlands over 5 acres in size are recommended as part of public system of conservation and other open space areas.

Indoor Facilities

Swimming Pool and Ice Skating Rink. No such facilities are recommended for Harwich at this time. Reliance should be upon such facilities in other towns on Cape Cod, particularly in Hyannis.

Recreation Center. An addition of approximately 2,500 sq.ft. to the present recreation building is recommended (see Fig. 35 in the section on Public Buildings and Lands).

Summer Theater (Playhouse). The present junior theater should be retained for youth groups but, in addition, a new summer playhouse should be constructed on a site adjacent on the west to Brooks Academy (see Fig. 35 in the section on Public Buildings and Lands).

Golden Age Center. A portion of Brooks Academy is recommended for this use (see Fig. 35 in the section on Public Buildings and Lands).

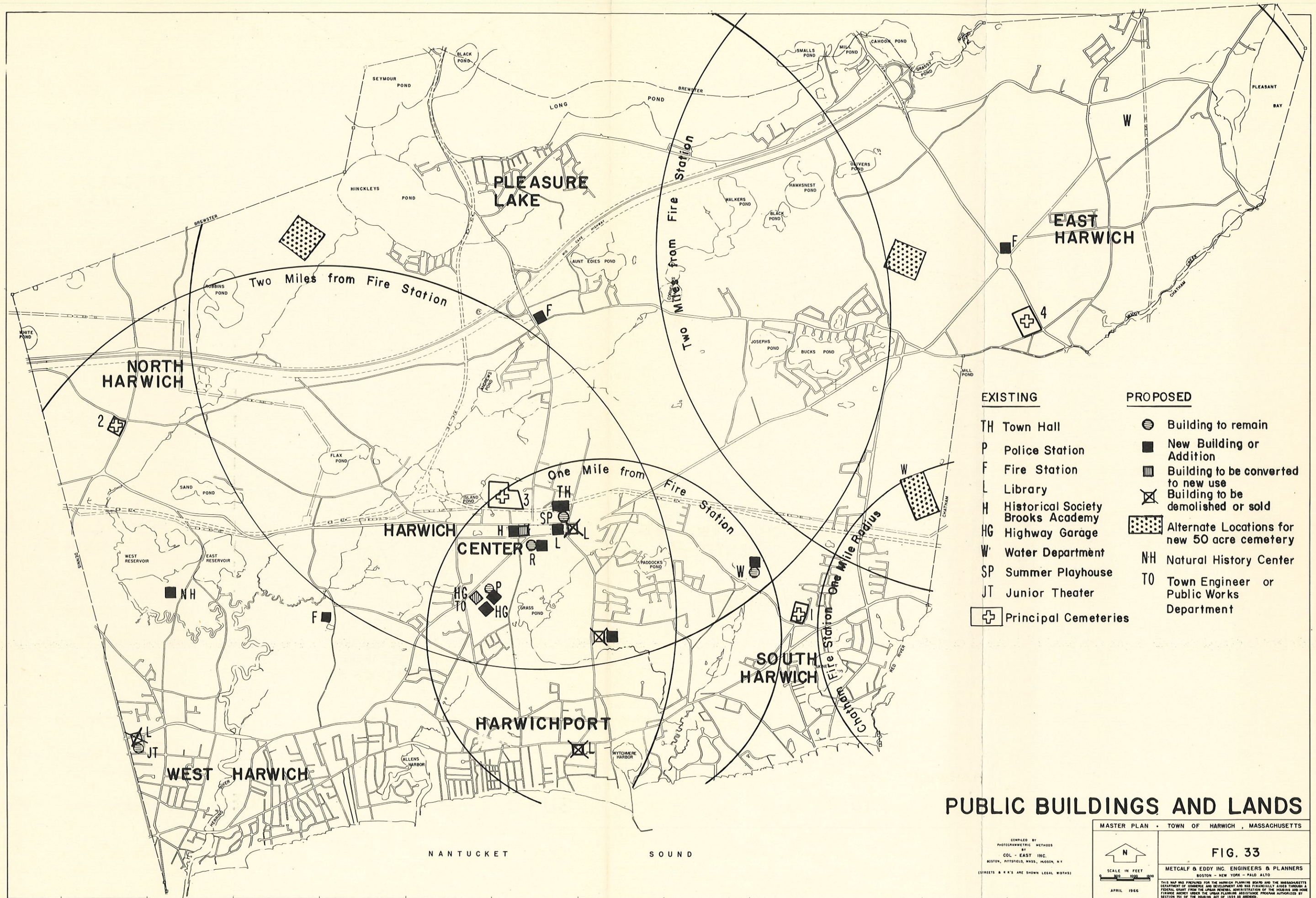
Recreation Program. A year-round program, possibly under the directorship of a high school teacher, should be undertaken by 1970.

Tax Titles. It is recommended that the Conservation Commission be given first refusal on any such land "acquired" by the town.

Public Buildings and Lands

Inventory. Table 47 is an inventory and description of existing public buildings and town-owned lands other than those associated with the public schools or recreation conservation facilities. Cemeteries are shown separately in Table 48. The various United States Post Offices are not included in this physical inventory.* The buildings and lands under consideration here include the town hall, the police station, the fire station, the three libraries, Brooks Academy, the highway garages, the Water Department's buildings and lands, and the town-owned cemeteries. Also included are buildings and lands of historical significance. The location of these buildings and lands is shown on Fig. 33.

*Each principal village in Harwich now has its own separate post office and post office address. This situation is not conducive to unifying Harwich into an integrated community. The village post office no longer offers the convenience that it did before the day of the automobile. While it is recognized that most mail distribution, particularly in summer, will continue to be at the post office, the advantages of a single post office to serve the entire town should be carefully considered.



EXISTING	PROPOSED
TH Town Hall	⊙ Building to remain
P Police Station	■ New Building or Addition
F Fire Station	▨ Building to be converted to new use
L Library	⊗ Building to be demolished or sold
H Historical Society Brooks Academy	▤ Alternate Locations for new 50 acre cemetery
HG Highway Garage	NH Natural History Center
W Water Department	TO Town Engineer or Public Works Department
SP Summer Playhouse	
JT Junior Theater	
⊕ Principal Cemeteries	

PUBLIC BUILDINGS AND LANDS

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS

FIG. 33

METCALF & EDDY INC. ENGINEERS & PLANNERS
 BOSTON - NEW YORK - PALM BEACH

APRIL 1966

SCALE IN FEET
 0 100 200

COMPILED BY
 PHOTODUPLICATION METHODS
 BY
 COL - EAST INC.
 BOSTON, PITTSFIELD, MASS., HOUSTON, TX

STREETS & R.A.'S ARE SHOWN LEGAL WIDTHS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE WRECKENHURTTOWN
 DEPARTMENT OF CONSERVATION AND DEVELOPMENT AND WAS FINANCIALLY AIDED THROUGH A
 FEDERAL GRANT FROM THE URBAN DESIGN ADMINISTRATION OF THE HOUSING AND URBAN
 DEVELOPMENT DEPARTMENT UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY
 SECTION 101 OF THE HOUSING ACT OF 1954 AS AMENDED.

NANTUCKET SOUND

Table 47. Inventory of Public Buildings and Lands

Building	Approx. age	Addit. or renov. yr.	Floor space sq.ft.	Site size, acres	Off-street parking spaces
Town hall	52	None	5,500	0.7	22
House (adjacent to town hall)	50(est.)	None	2,500	1.38	0
Police station	5	None	3,500	0.78	14
Fire station	37	1958	6,500	3.6	18
Brooks Free Library	86	1936	2,500	0.61	0
Former telephone exchange	75(est.)	None	1,200	0.12	0
Harwichport Library	15(est.)	None	3,000	0.31	3
Chase Library	50(est.)	None	2,500	0.12	0
Brooks Academy	125	None	6,200	0.94	0
Highway garage	30(est.)	None	3,200	3.4	5
Highway equipment bldg.	1	None	2,400		0
Water dept. bldgs.	30 and 20	-	3,000	over 25	3

Sources: Town offices and field survey by Metcalf & Eddy, Inc., Est. Estimated because unknown or not readily available.

Table 48. Inventory of Principal Cemeteries ⁽¹⁾

Name ⁽²⁾	Approximate area, acres		Unused capacity (lots)
	Vacant and available	Total	
1. South Harwich	0.0	2.4	None
2. North Harwich	0.0	2.5	None
3. Island Pond	11.0	15.0	300
4. Evergreen	<u>0.0</u>	<u>9.3</u>	None
Total	11.0	29.2	

1. Cemeteries smaller than 2 acres omitted.
2. Numbers refer to Fig. 33.

Source: Annual Reports and Assessor's Maps.

Present and Future Requirements. Present and future requirements for the development of public buildings and lands are listed in Table 49. These are nationally recognized standards revised as necessary to meet the individual needs of Harwich.

Table 49. Recommended Public Buildings and Lands Standards

Building	Number required	Min. site acres	Min. floor space sq. ft.	Off-street parking spaces
Town hall	1	3	12,000-15,000	50
Police station	1	1	3,000-5,000	15
Fire station	3-4	2 ea.	3,000-5,000 ea.	25
Library, main	1	1	10,000-12,000	25
Public works garage, bldg. and office	1	15	12,000-15,000	25
Cemetery	1	50	-	50

Source: Nationally-recognized standards adjusted by Metcalf & Eddy, Inc., to meet individual needs of Harwich.

Adequacy. The existing public buildings and lands are evaluated individually as follows.

Town Hall. This one-story plus basement structure, originally built as a bank in 1914, and located on Main Street in Harwich Center, is fire-resistant and in good condition. Its principal problem is its small size. The building is being used to capacity by the Selectmen, Town Clerk, Town Treasurer, and their necessary supporting personnel.

The site is well-located, but contains only about 0.7 acre. A town-owned parcel 0.26 acre in area abuts the town hall parcel on the north, providing access to Railroad Avenue (unimproved).

House (Adjacent to Town Hall). The two and one-half story wood-frame house on a 1.38 acre lot lying immediately west of the town hall was purchased recently by the town. This vacant building is in a fair condition. We understand the reason for purchasing this lot was for use as a site for an addition to the town hall.

Police Station. This one-story plus basement wood-frame building located on Route 39 in Harwich Center is only five years old, and appears to be adequate for current needs. The location is central and the site is large enough for adding a wing or a separate structure in the future.

Fire Station. The existing two-story, wood-frame fire station, located on Bank Street in Harwich Center, serves all of Harwich. It is an aggregation of additions dating from 1929 and has inadequate wiring and locker facilities. There is hazardous above-ground storage of fuel oil under wood exit stairs and next to the structure's wooden siding.

The central location of the existing station provides quick access to nearby calls, but more remote areas require runs of 10 to 12 minutes (East Harwich), 7 to 8 minutes (West Harwich), and 4 to 6 minutes (North Harwich). Immediate consideration should be given to the construction of a new fire station in West Harwich.

A site in West Harwich already has been purchased for such new station. However, it is not recommended that it be used for this purpose because of its poor location in relation to the area to be served; i.e., it is too far east and too close to the existing station in Harwich Center.

A recent report (May 14, 1965) by the New England Fire Insurance Rating Association, Boston, Massachusetts, makes many recommendations regarding the staff and equipment of the Harwich Fire Department.

Recommendations in this report receiving an asterisk for immediate attention were:

1. Construction of a fire station in West Harwich near the junction of Routes 28 and 39.
2. Purchase of a 1,000 gpm. pumper for this new station.
3. Manning of the fire alarm system at all times.

Brooks Free Library. This two-story, wood-frame building, erected in 1880 on Main Street in Harwich Center, has the style of a 19th century farmhouse, adapted to commercial use. The straightforward two-story form of this structure is unusual in this native home of the Cape Cod cottage. However, this building is typical of small town commercial structures of the period, with its use of a false roof between first and second floors, and the intended arrangement of shops on the first floor and apartments above. The building is of questionable historical significance. The building is in only fair condition and of only average quality original construction.

The library is located on the second floor, an undesirable situation in view of the number of older persons using the library. The Second District Court, located on the first floor of the library building, is planning to move in the near future to a new building. This would make the entire building available to the library, or to some other use.

The greatest deficiency of this site other than its small size, is its total lack of off-street parking. Also the building stands in the path needed for extending Oak Street to Bank Street.

Former Telephone Exchange Building. This one-story, frame structure, stands immediately west of the Brooks Free Library. The old telephone building, vacant for several years, has recently been rezoned from residential to commercial use. However, its desirability for this purpose is severely limited by its small site size (0.12 acres) and its total lack of off-street parking.

Harwichport Library. This one-story, wood-frame building, located on Bank Street in Harwichport, serves principally as a village facility. Operated by a private library association, which receives an annual appropriation from the town, the building is relatively new. The site is well-located, but inadequate in size with insufficient room for off-street parking. Owing to its small building size, annual budget and number of volumes, it serves a useful function as a reading room or lending facility, but not as a full-fledged library.

Chase Library. This one and a half-story, wood-frame building, located on Route 28, near the Dennis town line in West Harwich, serves principally as a village facility. Operated by a private library association, which receives an annual appropriation from the town, the building is in good condition. The site is poorly-located for service to the total Town of Harwich, too small and contains no parking facilities. Owing to its small building size, annual budget and number of volumes, it serves a useful function as a reading room or lending facility, but not as a full-fledged library.

Brooks Academy. This two-story, wood-frame structure, built about 1840 on Parallel Street in Harwich Center, and originally a private educational institution, was used until 1963 by the Harwich Public School System. It presently is occupied by the Harwich Historical Commission and town offices of veterans' affairs.

The Harwich Historical Commission is currently working with the State Historical Commission to have Brooks Academy declared a certified historical building. It is the only building in Harwich of any particular historical significance.

Its potential uses include a meeting place for local organizations, as an educational institution, in some relationship with the activities in the recreation building just across the street, or as a historical museum. Because of its interior arrangement, it probably is not suitable for a summer theater.

Highway Garage and Equipment Buildings. These structures, combined on one site on Route 39 (Sisson Road) in Harwich Center, appear to be in good condition, and adequate for current needs. The new equipment building, lying behind the garage, is only one year old.

Their location is good, in terms of access by road to various parts of Harwich, but less satisfactory when

site size and land use conflicts are considered. The town garage lying within 50 ft. of Sisson Road, is an industrial type of activity which, unless extreme care is taken to provide proper screening and buffering, acts adversely on adjacent residential property.

Water Department Buildings. These various structures, located on Chatham Road in Harwich Center, appear to be in good condition, and adequate for current needs.

The site is large enough for additional buildings as needed. There is good buffering between this industrial-type activity and adjoining residential lands.

Cemeteries. The Harwich Cemetery Commissioners are responsible for the care and maintenance of 12 cemeteries. Of these, only four are large enough to be listed as principal cemeteries and only one, Island Pond, is active. In 1963, it was estimated that Island Pond has enough unused land for an additional 370 lots.* Island Pond has been selling about 35 lots per year.** At this rate, Island Pond will be completely filled by about 1974.

Recommendations. Fig. 33 illustrates graphically the following recommendations and serves as the proposed public buildings and lands plan.

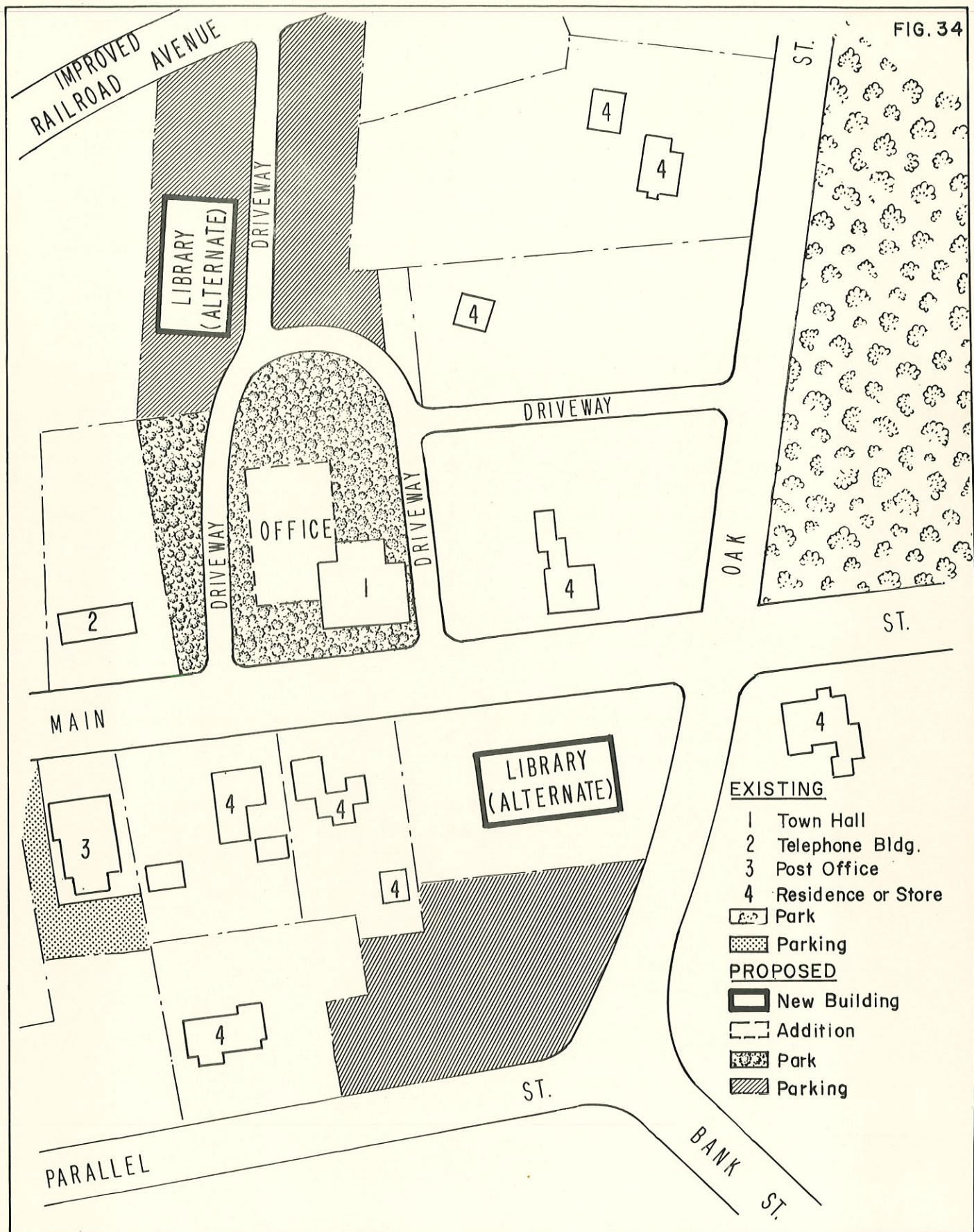
Policy. Where feasible, public buildings and lands should be grouped by functional centers such as a civic center, historical area, etc.

1. The town hall should be maintained in the existing building. An addition should be built to the west and rear of the existing building. The adjacent house to the west should be demolished and a new driveway and parking lot built. The enlarged town hall should serve as the initial building of a civic center (see Fig. 34). At a later date an office of the town engineer or then existing public works department should be erected in conjunction with the highway garage and equipment buildings.

2. The police station should be maintained on the existing site. When more space is needed, a wing should be added on the south east end of the existing station.

*Annual Report, Town of Harwich, 1963, p. 108.

**Annual Report, Town of Harwich, 1964, p. 59.

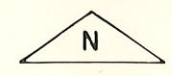


- EXISTING**
- 1 Town Hall
 - 2 Telephone Bldg.
 - 3 Post Office
 - 4 Residence or Store
- PROPOSED**
- Park
 - Parking
 - New Building
 - Addition
 - Park
 - Parking

MASTER PLAN ● TOWN OF HARWICH ● MASSACHUSETTS

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD & THE MASSACHUSETTS DEPARTMENT OF COMMERCE & DEVELOPMENT & WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING & HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

CIVIC CENTER



Not to Scale

3. At least two and possibly three fire stations are needed during the next 15 years. The exact number of fire stations and their locations will depend to a certain degree on cooperative arrangements with the fire departments of adjoining towns.

The recommended scheme for fire station location is presented on Fig. 33. This is based on an approximate service radius of 2-1/2 miles for each fire station in urbanized areas and 5 miles in rural areas.

A new station in West Harwich has the highest priority because of high property values in this area and the difficulty in serving the area from Bank Street in the summer when Route 28 traffic impedes the fire apparatus. A fire station in West Harwich on the old town dump site on Lothrop Avenue would greatly improve fire protection for all properties west of Harwichport.

The second priority goes to a station in Harwich Crossing - East Harwich at the intersection of Routes 39 and 137. Such location would provide direct and quick access to the entire northeastern portion of Harwich.*

The third priority goes to a new station located at the intersection of Route 124 and Queen Anne Road. Such location would provide direct and quick access to the north central and northwestern portions of Harwich.

The fourth priority goes to the replacement of the existing fire station in Harwich Center on an enlarged site.

For purposes of 24 hour manning of the fire alarm system, it is recommended initially that this be combined with the police communications board now located in the police station. When the existing fire station in Harwich Center is replaced, a separate fire communications center should be located in this new building.

*It is assumed that some arrangement can be worked out with Chatham, whereby South Harwich also can be protected by the Chatham Fire Station on Route 28.

4. A new town library should be built on a site created by combining the lot on which the Brooks Free Library is located with the one on which the old telephone exchange is located, the two vacant lots to the south, and the abandoned adjacent portion of Bank Street.* The two existing structures (Brooks Free Library and former telephone exchange building) should be demolished. Alternative arrangements would be the construction of the library as a wing of the junior-senior high school or behind the existing town hall.* For access purposes Railroad Avenue should be improved.

5. The two existing branch libraries (Harwichport and Chase Libraries), following the construction of the new town library, should be sold and their books, other materials, and equipment transferred to the new town library.

6. Brooks Academy should be converted for combined use as an historical museum and a "golden age" center. When Route 39 (Sisson Road) between Main and Parallel Streets is relocated east to provide a direct connection with Pleasant Lake Avenue, it is recommended that a new summer playhouse be erected west of Brooks Academy. The three existing residences, one north of Brooks Academy and the other two in the way of the new Route 39 relocation, should be relocated elsewhere or demolished. The triangular area lying between Parallel Street and Sisson Road should be improved for total use as a Memorial Park. Adequate off-street parking facilities should be provided to serve all uses in the area (see Fig. 35).

The above proposed arrangement would consolidate various interrelated historical, theatrical, and recreational activities in one area. Just east of the site is a movie theater, and many churches are in close proximity. The varying in-time use of the assembly halls (churches, theaters, etc.) would enable joint occupancy of the suggested off-street parking facilities.

The architecture of the proposed new summer playhouse and the landscape treatment of the adjacent grounds should be in keeping with the historical architecture of Brooks Academy. The proposed area should be considered an Historical Area.

7. The activities of the highway garage and equipment buildings, including the movement, maintenance and storage of trucks and other heavy equipment, should be confined to the area "out back." According to the operational soils

*These various arrangements should be discussed with state library officials as to eligibility for federal grants.

survey, there is an area suitable for construction of buildings and roads just south of the area now being used for open storage. It is recommended that a new garage be built on this site. Such building would be buffered by wetlands on all sides except the north; therefore, adverse effects on residential properties would be minimized. The existing garage on Sisson Road should be used for garaging light equipment and storage only, demolished or possibly converted for use as a town engineer or public works department office.

8. The Water Department buildings should be maintained temporarily in their present location. When a town engineer or public works office is built in the Highway Department area, all Water Department activities also should be transferred to this area and necessary buildings erected to serve them. All Sewer Commission activities also should be consolidated in the same area. The site should be increased in size to 15 acres.

9. A new cemetery containing about 50 acres should be established. Possible alternate sites are indicated on Fig. 33.

10. The possibility of a natural history center on land near the reservoir on Herring River in North Harwich is suggested for the consideration of the town. An educational program in natural history would relate to activities proposed for the Brooks Academy (Historical Museum), but the resources of the Herring River Marshes would be the primary focus for scientific and educational activity. This possibility should be explored by a local study committee.

PUBLIC UTILITIES

Sanitary Sewerage

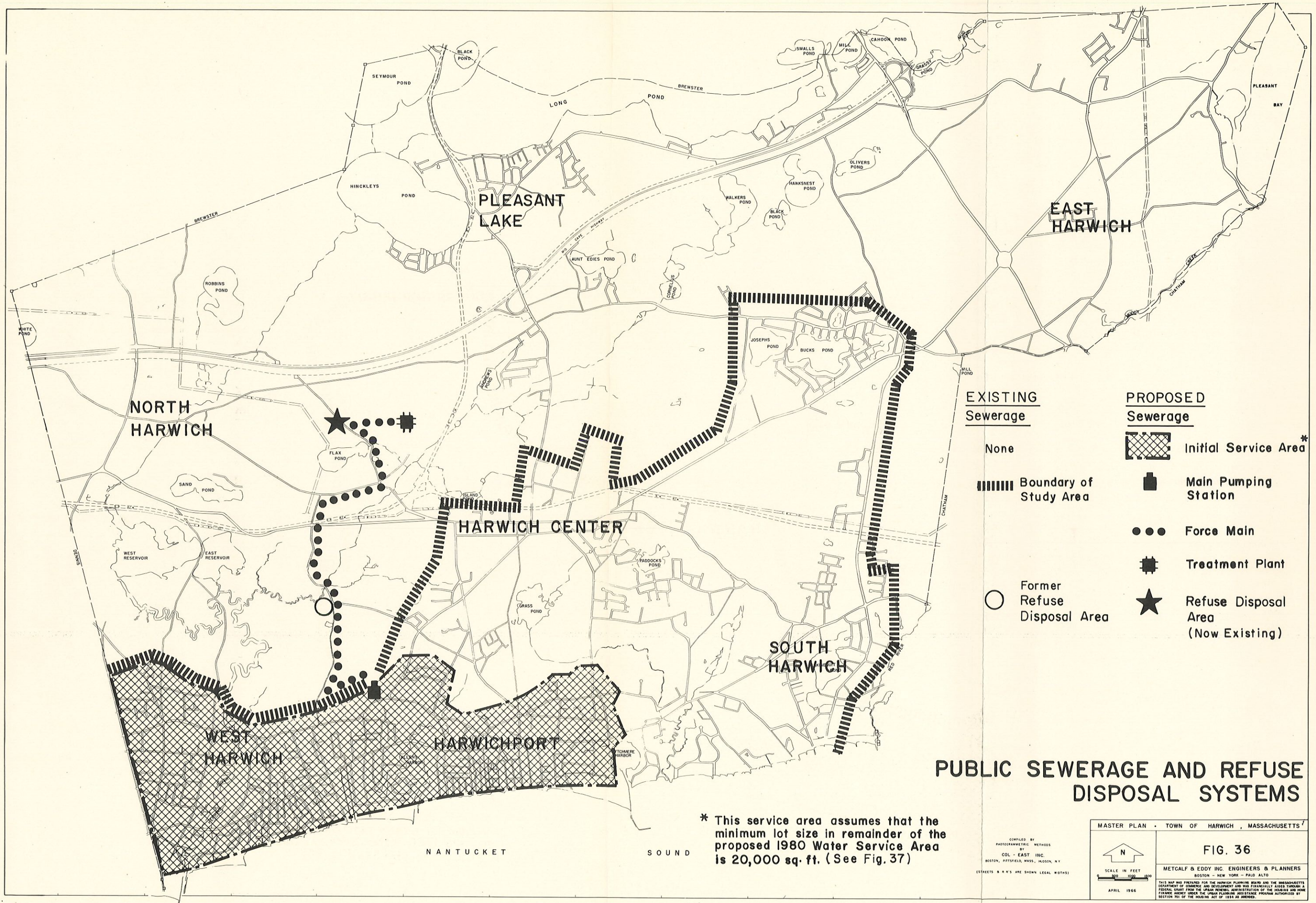
Inventory. There are no public sanitary sewerage facilities in Harwich. The entire town depends upon private on-lot systems - septic tanks, cesspools, etc.

Present and Future Requirements. A Report on Sewerage and Sewage Disposal was prepared for the Town of Harwich by Camp, Dresser & McKee, Consulting Engineers, in 1964. The study area of this report included only the more densely built-up sections of the town or those estimated to be served in the near future. The sections included were generally West Harwich, Harwichport, Harwich Center, South Harwich, and the Josephs-Bucks Ponds Area (see Fig. 36). In the report, there was no mention of possible linkages with adjoining towns.

The report recommended that all sewage originating in the study area be collected by a system of sewers, force mains and 16 pump stations, and conveyed to a main pump station to be located near the intersection of Main Street (Route 28) and Sisson Road. The sewage would be pumped to stabilization ponds near Queen Anne Road and treated. The effluent from the ponds would then be discharged into open sand beds for percolation into the ground for final disposal (see Fig. 36).

The 1964 Camp, Dresser & McKee Report on Sewerage and Sewage Disposal was based on a continuance of the relatively small lot sizes permitted by the present zoning by-law. The Operational Soils Survey prepared by U. S. Soil Conservation Service, including information on both soils types and water levels, was not prepared until 1965-66. It was not a requirement of the Engineer's report that it be determined if a public sanitary sewerage system is needed at this time throughout the entire study area.

Adequacy. As was indicated in the section on soils in Part I of this report, there are only 5,736 acres in Harwich (40.0 percent of the town's total area), which have none or only slight limitations for septic tank sewage disposal. As also indicated in that section, the minimum lot size even for these better areas, with public water available, but no public sewerage, should be



- | | |
|-----------------------------|-------------------------------------|
| EXISTING Sewerage | PROPOSED Sewerage |
| None | Initial Service Area* |
| Boundary of Study Area | Main Pumping Station |
| | Force Main |
| | Treatment Plant |
| Former Refuse Disposal Area | Refuse Disposal Area (Now Existing) |

PUBLIC SEWERAGE AND REFUSE DISPOSAL SYSTEMS

* This service area assumes that the minimum lot size in remainder of the proposed 1980 Water Service Area is 20,000 sq. ft. (See Fig. 37)

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS

FIG. 36

METCALF & EDDY INC. ENGINEERS & PLANNERS
BOSTON - NEW YORK - PALM BEACH

APRIL 1966

SCALE IN FEET
0 500 1000

THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF CONSUMER AND DEVELOPMENT AND WAS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

COMPILED BY
PHOTOGRAMMETRIC METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.
(STREETS & R.R.'S ARE SHOWN LEGAL WIDTHS)

20,000 sq.ft. With neither public water supply nor public sewerage, the minimum lot size should be 40,000 sq. ft. In another 22.4 percent of the town's area, the minimum lot size with or without public water should be 40,000 sq. ft. The remaining 37.6 percent of the town's area is not suitable for any type of private on-lot sewerage system. The minimum lot size presently permitted in these areas is 15,000 sq.ft. This indicates that there may be future problems of sewage disposal in most of the presently undeveloped areas in Harwich unless the following is done:

1. The minimum lot size is increased to either 20,000 or 40,000 sq. ft. as needed in those areas with public water supply;
2. The minimum lot size is increased to 40,000 sq.ft. in those areas without a public water supply where the land is not suitable for private on-lot water systems; or
3. A sanitary sewerage system is constructed to serve most of Harwich.*

There are some apparent existing problem areas in Harwich. Lot sizes in the "Campground" in Harwichport and in the area north of Lower County Road between the Herring River and Allen's Harbor, and below Lower County Road between Grey Neck Road and Brooks Road, all located in West Harwich, are so small that trouble with sewage disposal by septic tank or cesspool is bound to occur sooner or later.

It is also apparent that development has taken place in many spots where the water table is seasonally or permanently high enough to prevent the proper operation of septic tanks. Situations of this type occur particularly in Harwich Center, South Harwich, Harwichport, and West Harwich.

Another specific problem area is the "Great Sand Lakes" subdivision adjacent to Bucks and Josephs Ponds. This could be a problem because it is situated directly inland from the major wells now furnishing the town's water supply. While there is no evidence to date that any health hazard exists, it is necessary to consider that further development may well take place on the inland side of the town's water supply wells, and there is a possibility of future pollution.

*These proposed lot sizes, of course, are based on the assumption of a suitable water table, both permanent and seasonal.

In 1965, the summer peak population densities of the built-up areas ranged from about three persons per gross acre in Harwich Center to 15 persons per gross acre in Harwichport. This is true only in July and August. The rest of the year, the population densities drop to less than one person per gross acre in Harwich Center and less than three persons per gross acre in Harwichport.

Aside from the low areas with high water table, and the steep areas where lateral movement of effluent may cause trouble, most of the land in Harwich has a reasonable tolerance for the disposal of sewage effluent into the ground. Allowing for land for streets, and assuming 3.5 persons per dwelling unit, the recommended minimum lot size of 20,000 sq. ft., outside of wet areas and where a public water system exists, translates into a gross density of about five persons per acre. At present, only in Harwichport and West Harwich do gross densities exceed these levels, even in July and August. In the winter, no large area in Harwich exceeds five persons per acre.

Recommended planning standards for a public sanitary sewerage system in Harwich are shown in Table 50.

Alternative Solutions. It appears that there still exists a range of choice regarding public or private sewerage service in most areas of Harwich. At a minimum, Harwichport and West Harwich should be sewered. With immediate and strict use of adequate development controls and acquisition of large properly located areas of open space, the density of population in the remainder of Harwich might be kept low enough so that no further extension of the public sewerage system in the foreseeable future would be necessary.

If any relatively undeveloped areas, such as Harwich Center, are sewered, the development of these areas will be powerfully stimulated, and a spurt of local growth can be expected.

The Josephs and Bucks Ponds area, because of its location relative to the town wells which now supply all of the public water for Harwich, presents a special problem. It may develop that this area will have to be sewered in order to protect the public water supply. It is possible, since this is an isolated area, that a completely separate system may be appropriate. This question requires a detailed engineering study, which is beyond the scope of this report.

Table 50. Recommended Public Sanitary Sewerage System Standards

Item	Recommended standard
Basis of design	40 to 50 years for collection system 15 to 25 years for plant and pumping stations
Average daily flow	80 to 100 gallons per capita
Amount of infiltration	As determined by groundwater conditions
Minimum pipe diameter	8 in.
Minimum flow velocity	2 fps. (feet per second)
Maximum spacing manholes	300 ft.
Connection to system	All properties within 400 ft. of sewer

Source: Nationally-recognized standards adjusted by Metcalf & Eddy, Inc. to meet the individual needs of Harwich - generally in agreement with those recommended by Camp, Dresser & McKee.

Another special situation exists in the topographic relationship between West Harwich and Dennisport. It may be possible, when designing a sewerage system for West Harwich, to include whatever portion of Dennisport could be readily served by gravity flow. An equitable financial arrangement between the two towns, of course, would have to be negotiated for this joint service.

Recommendations. It is recommended that Harwich carry out the "Proposed Initial Construction Program," as described on page 68 of the Camp, Dresser & McKee report.* This would sewer most of Harwichport and West Harwich (see Fig. 36). Included in the area served would be the Belmont Hotel, the commercial laundry on Doane Road, the "Campgrounds," and Snow Inn, as well as businesses along Route 28. This plan for sanitary sewerage is in harmony with the Future Land Use Plan for Harwich, which recommends high intensity development in Harwichport and West Harwich, and low density residential development in the remainder of Harwich.

The above recommended plan for providing public sewers in only Harwichport and West Harwich is based on carrying out the following - otherwise the entire study area will have to be sewerred:

1. Adoption within the year of the proposed zoning by-law and map carrying out the minimum lot sizes shown on the Future Land Use Plan.
2. Strict enforcement of this new zoning by-law and map.

*Since the completion of the Engineer's sewerage report, state and federal grants for sewage treatment works have increased greatly. For example, at the time of the report the maximum grants available in Massachusetts were 30 percent. At the present time a combination of federal and state grants could amount to as much as 75 or 80 percent of the cost.

As pointed out in the sewerage report, about 120 acres of land will be needed for the stabilization ponds and buffer zones. Under certain wind and climatic conditions odors may be noticeable outside these buffer zones. The water surface on the ponds would be about 900 ft. from the Mid-Cape Highway at its closest point.

In view of the large amount of land that would be needed, which would be permanently removed from development, and the much larger grants now available, it is recommended, that the town reconsider the specific advantages and disadvantages of constructing a conventional mechanical sewage treatment plant on the selected site, instead of the recommended stabilization pond treatment facility.

3. Strict enforcement of the already-adopted Land Subdivision Regulations proposed as part of this Master Plan Program.
4. Immediate acquisition and protection of the public open spaces (conservation areas) in the sewer study area shown on the Recreation and Conservation Plan (Fig. 32).
5. Correction of existing isolated sanitary problems caused by either high water table or inadequate construction of existing septic tanks or cesspools.
6. Strict enforcement of Article XI of the State Sanitary Code for Massachusetts which sets forth minimum standards for the disposal of sewage in unsewered areas, principally by private on-lot systems. This article is a matter of law in all cities and towns in the Commonwealth and is administered in Harwich by the Board of Selectmen acting as the Board of Health.

Water

Inventory. The existing well-fields and storage tanks, and the existing distribution system, as described in local records, are shown on Fig. 37.

In its 1966 report, Whitman & Howard, Inc., Engineers, estimated that the existing wells, plus those proposed in South Harwich and East Harwich as shown on Fig. 37, would have a maximum pumpage rate of 8.9 mgd. (million gallons per day).

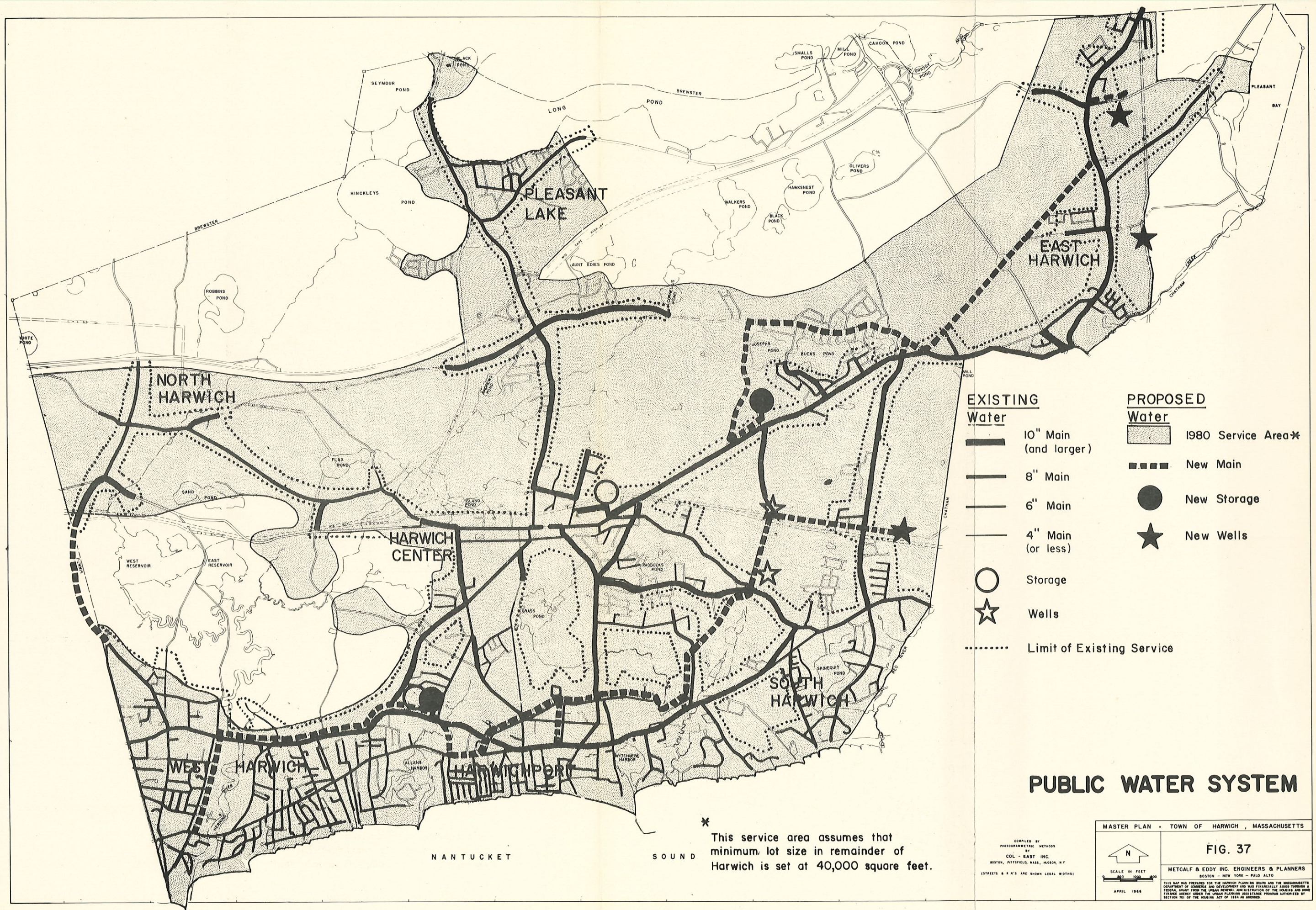
Present and Future Requirements. Current levels of demand upon the Harwich water system are indicated in Table 51. An estimate of future water demand is presented in Table 52.

The estimate for the 1980 peak day demand on the public water supply was based on projections of population and housing made in Part I of this report, together with assumptions about the number of services in 1980 and the possible demand per service.

Table 51. Water System Statistics

Year	Average day, mgd.		Maximum week, mgd.	Maximum day, mgd. Date	Amount	Number of services	Gallons per service, peak day
	Winter	Summer					
1966	0.387	1.290	16.697	July 22	2.985	3,518	848
1965	0.368	1.295	12.937	July 4	2.409	3,300	730
1964	0.362	1.132	11.546	June 21	2.210	3,129	706
1963	0.273	0.915	10.659	July 28	1.956	2,993	654
1962	0.248	0.883	9.130	July 7	1.732	2,879	602
1961	0.220	0.770	11.049	July 4	1.997	2,736	730
1960	0.202	0.754	7.488	July 11	1.441	2,573	560
1959	0.200	0.685	7.414	August 20	1.385	2,424	571
1958	0.188	0.610	7.713	August 11	1.303	2,282	571
1957	0.221	0.900	10.421	July 3	1.752	2,181	803
1956	N.A.	N.A.	7.295	July 2	1.493	2,053	727

Source: Harwich Water Dept.



- | EXISTING Water | | PROPOSED Water | |
|----------------|---------------------------|----------------|--------------------|
| | 10" Main (and larger) | | 1980 Service Area* |
| | 8" Main | | New Main |
| | 6" Main | | New Storage |
| | 4" Main (or less) | | New Wells |
| | Storage | | |
| | Wells | | |
| | Limit of Existing Service | | |

PUBLIC WATER SYSTEM

* This service area assumes that minimum lot size in remainder of Harwich is set at 40,000 square feet.

COMPILED BY
PHOTOGRAMMETRIC METHODS
BY
COL - EAST INC.
BOSTON, PITTSFIELD, MASS., HUDSON, N.Y.
(STREETS & 4" S ARE SHOWN LEGAL WIDTHS)

MASTER PLAN • TOWN OF HARWICH, MASSACHUSETTS	
 SCALE IN FEET APRIL 1966	FIG. 37 METCALF & EDDY INC. ENGINEERS & PLANNERS BOSTON - NEW YORK - PALO ALTO <small>THIS MAP WAS PREPARED FOR THE HARWICH PLANNING BOARD AND THE MASSACHUSETTS DEPARTMENT OF CONSERVATION AND DEVELOPMENT AND WAS FINANCIALLY ASSISTED THROUGH A FEDERAL GRANT FROM THE URBAN HOUSING ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.</small>

PART III

EFFECTUATION PROGRAM

To complete the Master Plan, it is necessary to present recommendations as to how the 1980 Development Plan can be put into effect. A definite program for this purpose is described in this part of the report under the following topics: Land Subdivision Regulations; Zoning By-Law; Capital Improvements Program based on a fiscal analysis of past trends and projection of financial capability over the next six years; Economic Development and Tourism Program; and steps for updating the Master Plan and ensuring public acceptance.

Table 52. Estimated Future Domestic Water Needs

	Existing 1963 mgd.	Future 1980 mgd.
Average day - winter	0.27	1.5
Average day - summer	0.92	3.0
Average day - maximum month	1.20	4.0
Average day - Maximum week	1.52	5.0
Peak day of year	1.96	6.0

Source: Estimates by Metcalf & Eddy, Inc.

The required pumpage capacity for the public water system should be at least as great as the peak day demand, so that (1) storage facilities can be kept filled for fire protection and (2) a well or a group of wells can be out of commission without creating an emergency situation. Whitman & Howard noted in the 1965 report that, with a pumping capacity of about 3.5 mgd. at that time, on the peak day of 2.31 mgd. there was no water in the elevated tank on Route 28. This suggests that the observed peak rate might have been even greater had adequate storage been provided. Whitman & Howard has recommended that Harwich develop a water supply with a maximum pumping rate of at least 8 mgd. This would provide a reasonable margin above the estimated peak day demand of 6.0 mgd. in 1980.

Recommended planning standards for a public water system in Harwich are shown on Table 53.

Adequacy. Fire flow tests indicate that the distribution system is weak in the Harwichport and West Harwich areas. The proposed new main from the well-field to Harwichport should greatly improve this situation. Until this improvement is made, fire flows will be inadequate in this area.

The New England Insurance Rating Association prepared a report on Harwich's Water Supply, Fire Department, Fire Alarm System, Fire Protection System, Building Laws, and Conflagration Hazards, dated May 14, 1965. The first 16 of the total of 52 recommendations are concerned with the water system. The report indicates with an asterisk, that recommendation No. 7 is thought to be the most urgent of the 16. Recommendation No. 7 suggests

"That an investigation be made to determine the best way to strengthen areas in town that showed inadequate fire flows." This emphasizes the importance of developing an over-all plan for the future development of Harwich's water system.

Table 53. Recommended Public Water System Standards

Item	Recommended standards
Basis of design	15 years for supply 25 years for distribution system
Water supply	Average day - 100 to 120 gallons per capita Maximum day - 250 gallons per capita
Distribution storage	Sufficient to provide 3,000 gpm. for 10 hours provided pumping capacity equals maximum day demand with largest pump out of operation.
Minimum pipe diameters	8 in. in residential and other areas 10 in. in industrial areas
Maximum hydrant spacing	at each street intersection and/or 350 ft. in commercial, industrial and high density residential areas; 500 ft. in medium and low density residential areas.
Hydrant grating	Required
Minimum fire flows	High density residential areas - 1,500 gpm.(1) Medium density residential areas - 1,000 gpm. Low-density and rural residential areas - 500 gpm. Commercial areas - 2,500 gpm. Industrial areas - 3,000 gpm.
Quality	Meet Drinking Water Standards of Public Health Service.
Connection to system	All buildings within 400 ft. of a main.

1. Gallons per minute.

Source: Nationally-recognized standards adjusted by Metcalf & Eddy, Inc. to meet the individual needs of Harwich.

Recommendations. The following improvements are recommended and shown on Fig. 37:

1. To ensure adequate fire protection, complete the carrying out of the 1965 recommendations of the New England Fire Insurance Rating Association relative to water supply.
2. Develop additional well supplies to the total capacity of at least 8 mgd. as required over the next 20 years in accordance with recommendations of the report of the town's consulting engineer dated December 1965, and November 1966.*
3. Construct additional water mains as needed to serve the recommended 1980 service area shown on Fig. 37.
4. Provide additional storage tanks of sufficient capacity not only to meet the requirements for fire reserve but also daily peak demands in excess of the pumping capacity of the wells. Such storage to be added as needed at suitable locations to best serve present and future growth of the town.
5. Develop an integrated plan for the phased construction of the additional supply, distribution mains and storage facilities with relation to the pattern and intensity of land use envisioned by the future land use plan presented herein to meet the requirements for fire protection, domestic, industrial and commercial uses of the town through 1980. The integrated plan should consider possible joint development and use of facilities with the adjacent Towns of Dennis on the west and Chatham on the east.

*Reports by Whitman & Howard, Inc., Engineers, Boston, Massachusetts.

6. Minimum requirements for water supplies in areas not supplied by public systems are being prepared by the Massachusetts Department of Public Health for subsequent enactment as part of the State Sanitary Code. When this article of the code is enacted by the Legislature it will be law in all cities and towns of the state, and should be regarded as the minimum standards for private water supplies in Harwich. Until such time as these standards are available, the joint use of the drinking water standards* and the construction standards for wells** of the Public Health Service are recommended. These standards may be used to assure that wells and private water supplies meet minimum performance standards.

Storm Drainage

Inventory. Harwich has no man-made public drainage system made up of pipes, culverts, etc. The existing natural drainage system consists mostly of chains of cranberry bogs, and scattered ponds. The Herring River, and its salt marsh, forms the only sizable exception to the cranberry bog system.

Most of the drainage in Harwich, then, is under the direct control of the cranberry growers. This has not created any significant conflict with respect to storm drainage because the amount of run-off from rain storms is very small, due to the droughty character of the sandy soil. The volume of water in the small streams in Harwich is fed more by the water-table than by surface run-off. This means that rainfall may have a cumulative effect after a long period of wet weather, but the rapid runoff type of flooding is virtually impossible in Harwich. The cranberry bogs, furthermore, are situated in low areas, typically well separated both horizontally and vertically, from residences.

Present and Future Requirements and Adequacy. At present Harwich has no major drainage problems. Fluctuations in groundwater levels between dry and wet years cause trouble with buildings in low areas. However, if development is

*U. S. Department of Health, Education and Welfare, Public Health Service, Drinking Water Standards, PHS Publication No. 956, Revised 1962, Washington, GPO, 1962.

**U. S. Department of Health, Education and Welfare, Public Health Service, Manual of Individual Water Supply Systems, PHS Publication No. 24, Revised 1962, Washington, GPO, 1963.

permitted to encroach upon marshes, swamps, ponds, streams, cranberry bogs, and areas of high seasonal water table, a considerable local cost for correction of drainage problems will be incurred. As an informed guess, it is estimated that uncontrolled development could cost the Town of Harwich at least \$250,000 by 1980, and the ultimate cost of complete drainage control would be in the millions of dollars. It should be evident that the acquisition of wetlands and lands with a high water table would be a less expensive policy.

Recommended planning standards for a public storm drainage system in Harwich is shown on Table 54.

Table 54. Recommended Storm Drainage Standards

Item	Recommended standards
Basis of design	Rational method employing data from nearest U. S. Weather Station
Design storm	5 years, except for bridges - 50 years
Minimum pipe diameter	15 in.
Minimum flow velocity	2.5 fps.
Maximum flow velocity	15 fps.
Minimum spacing catchbasins	400 ft.
Maximum spacing manholes	350 ft.

Source: Nationally-recognized standards adjusted by Metcalf & Eddy, Inc. to meet the individual needs of Harwich.

Harwich has some problems with street drainage, due to a lack of any storm drainage facilities along most of the town roads. These situations are being corrected as they occur. In new construction it will be possible to include drainage facilities when the road is built.

Recommendations. The following policies and improvements should be carried out:

1. The Board of Health should not approve any septic tank installations in land indicated as having severe limitations for this purpose in the Operational Soils Survey Report of the United States Department of Agriculture, on file at the Town Offices, without a thorough on-site investigation, and consideration of the time of year and the current level of the water-table.
2. For various reasons, including the problems of septic tanks and surface flooding, it is recommended that an exclusive cranberry bog zoning district be established as part of a revised zoning by-law to encompass all bogs and a strip of land around the bogs at least 100 ft. wide.*
3. Since many of the areas identified in the Soils Survey as having high water-table are also identified as the best areas in Harwich for growing trees, it is recommended that the Conservation Commission acquire these properties as identified by the Operational Soils Survey.
4. The acquisition by the town of all wetlands, other than cranberry bogs, is recommended as the only sure way to preserve open space, to protect drainage channels, to protect growth areas for fish, clams, etc., and to prevent filling and encroachment by developers with subsequent problems of health and sanitation as well as destruction of the natural amenity.
5. The Planning Board, in order to make precise zoning possible, should convert the zoning by-law to description by mapped areas rather than description by language.

*The other reasons include the need for working space around bogs; the need to protect the bogs against thoughtless intrusion; the need to protect the public against the noxious chemicals used to spray the bogs; and the need to ensure the continuance of cranberry growing as a part of the local economy.

6. The Selectmen should apply the State wetlands acts to the dredging or filling of wetlands in Harwich, as well as the Conservancy District provisions of the Harwich By-Laws.
7. The drainage provisions of the new subdivision regulations should be carefully enforced, to prevent future problems.
8. The town should install drainage facilities as needed on any major new construction work on town roads.

Refuse Disposal and Collection

Inventory. The town dump is located on the eastern edge of the Herring River Salt Marshes, near the intersection of Lothrop Road and Gilbert Lane (see Fig. 36).* There is a danger here of polluting the salt marshes, with consequent damage to shellfish and to the total environment of the area. The state has recommended that this site be abandoned as an open-face dump, and a suitable site be selected for a sanitary land-fill operation. The town has constructed a sand-fill dike to lessen the danger of pollution of the marsh from the many tons of refuse which have been placed in the old dump.

Harwich has no public refuse collection service. Residents either take their own refuse to the disposal facility or depend upon private collectors for such service.

Present and Future Requirements and Adequacy. Open-face dumps such as the present Harwich facility are unsanitary and unsightly. Particularly on Cape Cod, where such practice is detrimental to a large area of otherwise developable land, they should be abandoned as soon as possible.

The best solution which present technology offers for this problem is a properly designed and operated high-capacity incinerator. Such a facility probably would be too costly for any individual town on Cape Cod, but could be financed as a regional facility.

Recommended planning standards for a public refuse disposal and collection system in Harwich are shown on Table 55.

*Note: Between the times of preparation and final printing of this report the refuse disposal area was relocated.

Table 55. Recommended Refuse Disposal
and Collection Standards

Item	Recommended standards
Basis of design	25 years for refuse area
Average yearly refuse produced	0.5 tons per capita
Sanitary landfill acreage	1.1 acre-foot per 1,000 population per year
Minimum population for use of incineration	Generally 25,000 persons (1)
Minimum population for municipal collection	5,000 persons
Collection schedule	Once per week in winter and twice per week in summer
Materials collected	Refuse, garbage and rubbish (all materials)

1. Dependent also upon factors of distance and availability of open areas and fill for use in a sanitary landfill operation.

Source: Nationally-recognized standards adjusted by Metcalf & Eddy, Inc. to meet individual needs of Harwich.

Recommendations. Until a regional incinerator is available, some disposal facility must be provided for the Town of Harwich.

Camp, Dresser & McKee, Consulting Engineers have recommended an approximate 20 acre site north of Flax Pond for operation of a sanitary landfill (see Fig. 36).^{*} The Operational Soils Survey, recently completed by the U. S. Department of Agriculture, indicates that soil conditions in this area are suitable for sanitary landfill purposes, subject to slight limitations due to some steep slopes in the area.

Since the land is already acquired and the deficiency is not a serious one, no change in the proposed site is suggested. Additional public land is available adjacent to and west of the initial site, toward the power transmission

^{*}Note: Between the times of preparation and final printing of this report the refuse disposal area was relocated in accordance with this recommendation.

line. At least another 10 acres is available here, allowing for a wide buffer strip along the power transmission line, to protect future residences in this area.*

It is recommended that Harwich investigate the initiation of a public refuse collection, particularly during the summer months. The best arrangement probably would be a contract with a private collector under town supervision. A combined Harwich-Dennis refuse collection system might be more economical for both towns. This possibility should be explored.

*Based on the standard shown in Table 55, by 1980 Harwich will need to add to the proposed sanitary fill area.

LAND SUBDIVISION REGULATIONS

Existing Regulations

Control of land subdivisions, as defined and authorized by Chapter 41 of the General Laws of Massachusetts, is the responsibility of the Harwich Planning Board. Amendments to subdivision regulations, unlike changes in zoning which require town meeting approval, may be made by the Planning Board after proper notice and public hearing.

The original regulations were adopted March 29, 1949 and comprehensively amended May 20, 1954.

Adequacy of Existing Regulations

The major inadequacies of the existing by-law are as follows:

1. Several definitions, phrases, regulations and procedural requirements are not in conformity with the current state enabling legislation.
2. There is no requirement for a contour map prepared by field survey as part of the preliminary plan submission.
3. The performance guarantee procedure, which is of prime importance in protecting the town against inadequate construction, is unclear and insufficient in detail.
4. Many of the design and construction standards are questionable as to their applicability in Harwich, insufficient in detail, or not of a high enough standard to ensure quality construction. Such lower quality standards invariably lead to the assumption of higher than average maintenance costs by the town.

We recommend the adoption of a complete new set of land subdivision regulations. A preliminary draft of new land subdivision regulations was submitted to the Planning Board on March 9, 1966. A revised draft was submitted to the Board on June 1, 1966 and adopted on May 29, 1967.

CAPITAL IMPROVEMENTS PROGRAM

Capital Improvements Program

Harwich does not presently have a Capital Improvements Program. The purpose of this chapter is to examine the town's fiscal situation, evaluate the town's ability to finance a Capital Improvements Program, and recommend a practical Capital Improvements Program to implement the Master Plan.

Fiscal Pattern and Capabilities

A continuing problem for all towns is how to satisfy growing public service and facilities needs, and at the same time maintain some stability in the tax rate. Harwich appears to have the prospect of continuing growth, a result of the attractiveness of Cape Cod and increased population with increased incomes all along the Atlantic coast. Almost all recent growth in Harwich has been new single-family homes, about half seasonal and half year-round, with most of the new year-round families being older, without children.* Many of these new year-round families are retired persons.** As a result, there has been a notable increase in the demand for more services and new facilities of a more urban nature. These trends, a slow rise in state and federal aid, increases in the scope and costs for local governmental activities, and the likelihood of only moderate expansion of the town's nonresidential tax base*** appear to indicate the probability of an increasing tax rate for Harwich homeowners.

The direct tax (DT) in a town like Harwich, may be considered as the tax of last resort; i.e., the tax which, after revenue from other sources has been credited, must supply sufficient revenue to balance the local budget. It is thus a measure of the amount that a town feels it is able to expend to provide the kinds of services it wants. The direct tax is raised by a charge against the town's assessed valuation (AV), by applying a given tax rate (TR). This procedure may be expressed in the following formula: $\frac{DT}{AV} = TR$. If one assumes full and fair

*In 1967 32.0 percent of the Harwich tax base was represented by seasonal residential properties.

**In 1967 13.8 percent of the Harwich tax base was represented by properties owned by retired persons.

***In 1967 only 8.2 percent of the Harwich tax base was represented by nonresidential properties.

market value of all properties in a municipality, the TR may then be thought of as the percentage of total wealth to be expended to meet the spending level the town decides upon. These factors, and their interrelationships, are a general indication of a town's fiscal flexibility and strength. A town with a high TR, and low AV, will find it difficult to meet greater demands for service, or higher spending levels, because of increasing burden that taxes would place on the town's wealth. A town with a low TR and a comparatively broader AV is better able to support an increasing level of spending, without undue burden on its taxable wealth.

The relative position of one town to another in respect to fiscal capability may be determined by comparing figures on assessed valuation per capita, and per capita tax levies. It is important to recognize that the figures used in such a comparison are not precise. Many factors, such as the amount of institutional population and the relative amount of business and industry, differ from town to town and can affect the averages. They are, nevertheless, valuable indexes and useful in making comparisons.

A comparison of the relative fiscal position of Harwich with other municipalities in its local area of influence is made in the following table, using per capita market valuations, per capita tax levies, and an equalized tax rate for the year 1966.

Table 56. Compared Valuations, Tax Levies, Tax Rates(1)

Place	Full market valuation(2)		Per capita tax levy	Equalized tax rate (per \$1,000)
	Total	Per capita(3)		
Chatham	\$64,015,764	\$15,260	\$310.40	\$20.20
Brewster	31,092,899	20,282	209.30	10.40
Dennis	78,894,606	18,037	303.60	17.00
Harwich	77,499,147	16,045	270.30	16.00
Orleans	59,899,330	16,001	304.70	19.20

1. As of 1966.

2. Adjusted to "100 percent" valuation.

3. Based on 1965 state census figures.

Sources: Mass. Federation of Taxpayers; Boston Safe Deposit & Trust Co.

By comparing the taxable wealth in Harwich on a per capita basis with other towns in its local area of influence, we find that Harwich ranks third from the highest, while its tax rate ranks next to the lowest. Harwich has to expend only \$16 per \$1,000 of its total taxable wealth (AV) to meet its present level of services, while Chatham, for example, has to expend \$20.25 per \$1,000 of its full market valuation in order to achieve its current fiscal goals. The effect of high valuation per capita can be seen in Dennis and Brewster, where the tax rate is low relative to the per capita tax levy. Harwich is spending considerably less per capita than Orleans, Chatham, or Dennis, and considerably more than Brewster. Brewster, however, has a very different character than the four other towns. For Harwich, Chatham, and Orleans, the figure on direct tax levy per capita is a reasonable yardstick to compare governmental fiscal policies of these comparable towns. Thus, considering Harwich's lower per capita tax levy, and its equalized tax rate in comparison to Chatham and Orleans, the town appears to have a reserve taxing capacity adequate for an increase of as much as 15 percent of the total tax levy without reaching the per capita spending levels of the adjoining towns.

A comparison was also made of Harwich's municipal debt with those of neighboring towns. Measures of the relative debt in each municipality may be obtained by comparing figures on the net debt per capita, and the ratio of the net debt (excluding borrowing on public enterprise utilities such as water or electric facilities) to the town's total valuation. These data for the towns in the Harwich local area of influence are shown below:

Table 57. Compared Municipal Debt(1)

	Net debt per capita	Net debt ratio to "100 percent" valuation
Brewster	\$ 29	0.14
Chatham	302	2.01
Dennis	134	0.74
Harwich	348	2.17
Orleans	76	0.56

1. As of 1966.

Source: Boston Safe Deposit & Trust Co.

The figures above indicate that Harwich is more aggressive than its neighbors in using its borrowing power. In comparison to towns elsewhere in Massachusetts, all of these net debt ratios are low; but the special circumstances on the Cape, as to seasonal unemployment and the high percentage of retired persons on fixed incomes, must be kept in mind. Harwich appears to enjoy a comfortable level of town indebtedness, which, however, could be safely increased.

In conclusion, the combined picture of the town's fiscal resources, tax rates, and levels, indicate that Harwich is in a comfortable but not affluent condition. Many improvements will be required to meet future population demands for local services, so a careful and practical improvements program is needed to ensure the appropriate expenditure of public funds consistent with Harwich's fiscal capacity.

Fiscal Trends

The figures in Table 58 show that market valuation is increasing at about the same rate as costs of government. Both increased by about 33 percent between 1963 and 1967. The equalized tax rate increased only slightly during the same period.

A closer look at the trends of municipal expenditures indicates that the costs for schools have outpaced those for other governmental services. These increases in the costs for schools reflect gains in enrollments, rising educational standards in the Harwich school system, inflation of all costs, and the apparent desire of the municipality to have a high quality educational system.

Trends in the sources of revenue to meet the town's fiscal needs indicate a fairly stable situation. Nonlevy receipts, including state and federal aid, have grown a little faster than direct taxes.

Fiscal Projections

Projections of the town's fiscal structure are set forth in Table 59. The costs for operations show continuing rise, but the resources to offset these growing costs have kept pace. The Harwich tax rate during the next six years is expected to increase only six or seven dollars above its present 1967 level. The effect of the Capital Improvements Program on the tax rate is shown separately within the table. This demonstrates that the capital expenditures proposed for

Table 58 Fiscal Trends

	1963	1964	1965	1966	1967 ⁽¹⁾
	(All figures in \$000 except equalized tax rate.)				
<u>Expenditures</u>					
a. Operating					
1. Schools	521	610	685	750	750
2. Others	<u>539</u>	<u>590</u>	<u>655</u>	<u>695</u>	<u>822</u>
Total operating	1,060	1,200	1,340	1,445	1,572
b. Capital					
1. Debt service	224	221	230	218	224
2. Direct outlay	<u>47</u>	<u>41</u>	<u>56</u>	<u>64</u>	<u>39</u>
Total capital	271	262	286	282	263
All expenditures	1,331	1,462	1,626	1,727	1,835
<u>Receipts</u>					
a. State aid	278	450	380	438	656
b. Local nonlevy ⁽²⁾	165	196	209	256	
c. Other nonlevy ⁽³⁾	<u>94</u>	<u>130</u>	<u>100</u>	<u>108</u>	276
Total nonlevy	537	776	689	802	932
d. Direct levy	1,072	1,194	1,321	1,240	1,518
"100 percent valuation	60,690	61,180	60,690	77,499	79,878
<u>Equalized tax rate</u>					
(\$/1,000)	17.50	18.70	20.30	16.00	19.00

1. Estimated, based on adopted annual budget Mass. Dept. of Corp. & Tax.

2. Local nonlevy is sum of recoveries, water service revenues, and miscellaneous receipts.

3. Other nonlevy is sum of federal grants and county aid.

Source: Annual Reports, Town of Harwich.

Table 59 Fiscal Projections

	Projected expenditures and receipts ⁽¹⁾					
	1968	1969	1970	1971	1972	1973
<u>Expenditures</u>						
a. Operating						
1. Schools ⁽²⁾	900	975	1,050	1,125	1,200	1,275
2. Others	<u>775</u>	<u>825</u>	<u>875</u>	<u>925</u>	<u>975</u>	<u>1,025</u>
Total operating	1,675	1,800	1,925	2,050	2,175	2,300
b. Capital						
1. Existing debt service ⁽³⁾	200	200	200	200	200	200
2. New direct outlay ⁽⁴⁾	45	55	40	30	50	30
3. New debt service ⁽⁵⁾	<u>170</u>	<u>180</u>	<u>200</u>	<u>290</u>	<u>290</u>	<u>290</u>
Total capital	419	435	440	520	540	520
Total operating and capital	2,094	2,235	2,365	2,570	2,715	2,820
<u>Receipts</u>						
Total nonlevy	817	865	913	961	1,009	1,057
Direct levy ⁽⁶⁾	1,800	1,925	2,000	2,225	2,400	2,500
"100 percent" valuation	82,000	85,000	88,000	91,000	94,000	97,000
<u>Estimated equalized tax rates</u>	22	23	23	25	25	26

1. All figures in \$000 except equalized tax rates, which are in \$/1,000.
2. School costs and other expenditures projected on the basis of recent past trends.
3. A constant figure is assumed for continuing debt service, since some borrowing will continue for unpredictable purposes, and the purpose is to see if certain capital improvements can be financed in addition to the "normal" expenses of Harwich's government.
4. and 5. New Capital Improvements Program, from Table 60.
6. This figure is not a simple difference between other figures in this table because this is not a complete budget; but rather the amount to be raised by direct levy is related to the figures for total expenditures and total nonlevy, in a manner similar to the relationship in Table 58 above.

Harwich in this Master Plan are well within the town's fiscal capacity. The basis for these fiscal projections includes the assumptions concerning new home building, school enrollments, and other factors which have been developed in other sections of this Master Plan.

It is very difficult to project changes in nonlevy receipts from the state and federal government. Many programs of assistance, particularly state aid, now exist, and new ones can be expected in the future. This study projects past trends observed from 1963 to 1967. If these estimates are low, any aid in excess of these levels could provide additional funds for other capital expenditures.

Projections in assessed valuations reflect the estimates of the building inspector in past years. It seems reasonable to expect current trends in new construction to continue.

The Capital Improvements Program proposed in Table 60, for the most part, includes only those capital expenditures which may be considered as an immediate and recognized need to the town. The direct outlay figures, about \$30,000 to \$55,000 each year, include local street improvements, sidewalk improvements, payment to the Stabilization Fund, or other capital expenditures of an annual or continuing nature which are not likely to vary significantly for the next six years.

Capital Improvement Needs

The array of capital improvements needed to support population growth and to give effect to the Master Plan is presented in other sections. The needed capital improvements include the acquisition of land; recreation and conservation facilities; construction of sewers and a sewage treatment plant; new wells, water storage and supply lines; a fire station; library and other public buildings; street improvements; and the construction of a system of sidewalks and pedestrian ways.

Obviously, not all of these improvements could or should be considered within the next six years, since their need is based, in some cases, on a 15-year projection of population and land use. The items in Table 60 were selected as the ones to which immediate attention should be given. The proposed program (CIP) for the years 1968 through 1973 and the Capital Budget for the year 1968 are shown in Table 60. Items not included within this program, but mentioned in other phases of the planning study, should be considered as deferred, and subject to inclusion within later CIP's.

Table 60 Capital Budget for 1968 Capital and Improvement Program by Year 1968-1973(1)

Items	Gross cost(2)	1968	1969	1970	1971	1972	1973
<u>Education</u>							
e-1. Preliminary plans for third elementary school and renovation to intermediate school	\$	20,000	\$	\$	\$	\$ 20,000	\$
<u>Public Buildings</u>							
p-1. New West Harwich fire station	60,000	5,000	5,000	5,000	5,000	5,000	5,000
p-2. 1,000 gpm. Pumper fire engine	30,000		6,600	2,600	6,600	6,600	6,600
p-3. New library	300,000			20,000	20,000	20,000	20,000
<u>Recreation and Conservation</u>							
r-1. Open space acquisition including golf course	1,165,000	60,000	60,000	60,000	60,000	60,000	60,000
<u>Water System</u>							
w-1. New wells and connection	462,000						
w-2. New main supply lines	404,000						
w-3. Storage tank, pumping station addition and connections	409,000						
	1,275,000	108,500	108,500	108,500	108,500	108,500	108,500
<u>Sewerage System</u>							
s-1. Phase I	4,000,000				90,000	90,000	90,000
<u>Circulation Facilities</u>							
c-1. Kelley Road			25,000	10,000			
c-2. Oak Street							
c-3. Sidewalks and pedestrian ways	30,000	5,000	5,000	5,000	5,000	5,000	5,000
<u>Other</u>							
O-1. Miscellaneous capital expenditure for other departments	75,000	25,000	10,000	10,000	10,000	10,000	10,000
O-2. Stabilization fund	90,000	15,000	15,000	15,000	15,000	15,000	15,000
<u>TOTALS</u>							
Direct outlay/year		45,000	55,000	40,000	30,000	50,000	30,000
Debt serv./year		173,500	180,100	200,100	290,100	290,100	290,100
Total net cost		218,500	235,100	240,100	320,100	340,100	320,100

1. Annual payments for bond issues are estimated "on the high side" in early years with a corresponding reduction in annual payments in later years of the issue.

2. Gross cost assumes no federal or state grants (see notes on next page).

See notes on following page for detailed description of each item, and suggested financing.

Items

Education

e-1. Evaluation of need for and preparation of preliminary plans for third building on the existing elementary school campus (South Street and Sisson Road) and possible renovation of intermediate school.

Public Buildings

p-1. Acquisition of land for and construction of new West Harwich fire station on the old town dump site located on Lothrop Road. Bond issue - 20 years.

p-2. New 1,000-gpm. pumper. Bond - 5-year term.

p-3. New library. Bond issue - 20 years. Assumes a 25 percent federal grant, thereby reducing the town's cost to 75 percent or \$225,000.

Recreation and Conservation

r-1. Acquisition of permanent open space, principally in area south of Old Country Road and east of South Street, which, in the sewerage report study, is the area not recommended for Phase I public sewerage system and also for a golf course north of the high school. Bond-issue 20 years. Assumes a 50 percent federal and state grant for the conservation land, thereby reducing the town's cost to 50 percent or \$750,000.

Water System

w-1. Construction of Phase I - Part A water improvements including new wells, main supply lines, other
2 distribution mains, storage tank addition to main pumping station. Bond issue 15 years, and
and assumes no federal or state grant and a 25 percent average increase in water rates.
3

Sewerage System

s-1. Construction of initial sewer program for West Harwich and Harwichport plus main pump station, force main, and sewage treatment plant. Bond issue - 20 years. Assumes a 70 percent federal and state grant, thereby reducing the town's cost to 30 percent or \$1,200,000. Need to be verified by field testing.

Circulation Facilities

c-1. Elimination of poor site distance, side obstructions, and bad curve along Kelley Road between Main Street and Lothrop Avenue.

c-2. Extension and initial improvement of Oak Street between Main Street and Queen Anne Road.

c-3. Continuing annual program of installing new sidewalks and pedestrian ways. \$5,000 each year as a direct outlay.

Other

o-1. Annual expenditure of \$25,000 in 1968 and \$10,000 for other years as direct outlay for needed capital items for other town departments.

o-2. Stabilization fund or capital reserve fund, from which monies may be taken only for capital improvements expenditures by vote of town meeting. The fund's primary advantage is that it may provide an alternate to the long-term indebtedness incurred by bonding for large capital expenditures such as new schools. By saving in advance for capital improvement expenditures, interest can be "saved" rather than paid.

Programming on an Annual Basis

It is recommended that the CIP be reviewed each year, updated to include an additional year, and revised where necessary in keeping with changing needs and resources. Since the Planning Board, the Finance Committee, and the Board of Selectmen are likely to become involved in the responsibility or impact of new capital improvement expenditures, it is suggested they work together on this program.

An annual review of the CIP can be of immeasurable benefit to the community. By submitting each year a six-year Capital Improvements Program and Capital Budget, department heads can look ahead, and better coordinate projects one with another. As various projects approach the year scheduled, final costs, implications on financing, and other factors can be re-evaluated. Noncompletion of projects previously scheduled, unforeseen needs, or the availability of additional resources may also require changes in a CIP. For these reasons, updating of the CIP and Capital Budget each year will add greatly to their effectiveness as an instrument to ensure a continuity of long-range improvements related to an over-all view of municipal needs, and to aid in the achievement of development goals as expressed in the Master Plan.

ECONOMIC DEVELOPMENT AND TOURISM

Present Program

The town has no formal program and depends largely upon the promotional efforts of the Chamber of Commerce.

Recommended Program

A program to stimulate those aspects of economic development and tourism set as development goals in Part II of this report could include the following:

1. Creation of an Industrial and Economic Development Commission.
2. Preparation of a fact book listing Harwich's assets and interests in obtaining both an institution (private school or college) and an industry employing largely retired persons.
3. Preparation of a typical layout and rendering, for use in promotional efforts, showing how the proposed industrial area shown on Fig. 26 could look when completed.
4. Adoption of adequate housing and building codes and the recommended zoning by-law establishing stricter commercial and industrial controls.
5. A concern for the quality of tourist development and its actual importance to the town has been expressed in both the Economy Section of Part I of this report and the Development Goals Section of Part II of this report. The expressed goals indicate that protection of the natural environment will be favored in spite of any related losses in tourist development. As a result, it is recommended that no particular attempt be made to attract additional tourists to the town.

PLAN UPDATING AND PUBLIC ACCEPTANCE

A Continuous Process

The soundest Master Plan is worthless if the planning process is not continuous and the plan not flexible. Conditions and criteria change from time to time, and even though these changes may not take place rapidly, a part of the planning function is to coordinate the day-by-day activities that work toward development goals. The Master Plan gives direction to and sets standards for the interworking of development elements. It should receive daily use by officials, agencies, and private enterprise in current and proposed projects.

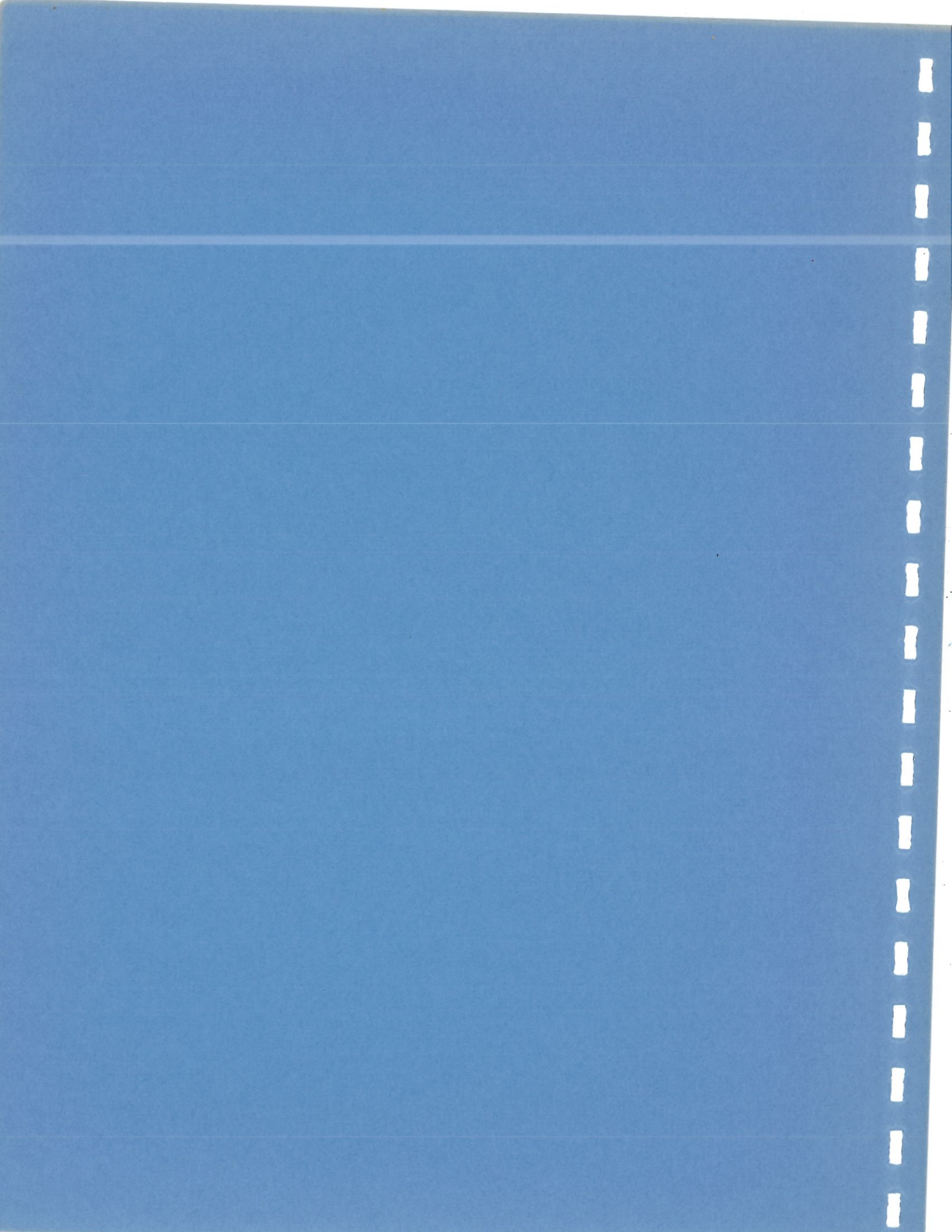
Experience dictates the need for continuous professional advice during the effectuation of the plan. By this means the plan can be kept current and should not need comprehensive updating in less than a 7 to 10 year period. Without such continuous advice it probably will need updating in 4 to 6 years.

Public Acceptance and Support

In the final essence the success of this plan lies in the hands of the citizens of Harwich.

Only public acceptance and support at town meeting for the plan's recommendations can cause this plan to become a reality.

APPENDIX A



Questionnaire No. _____

HARWICH COMMUNITY SURVEY QUESTIONNAIRE

NOTE: This questionnaire is an important part of the planning studies now underway in Harwich. The Harwich Planning Board is making this survey of the Community to (1) gather more information about the seasonal change in population, and (2) sample the attitudes of Harwich people toward certain local features.

Your answers to the questions will be confidential - your name will not be recorded and the information will be used only in statistical analysis, in combination with material from many other questionnaires.

If you are unable to answer any of the questions, just note "don't know" in the answer space and go on to the next question.

PART A: GENERAL FACTS

1. Please note today's date in the space following:

_____ (month) _____ (day) _____ (year)

- 1a. Today is (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday - check one)
2. What is the address at which you are currently living? (Street name and number; if Hotel, Motel, Apartment House, Guest House, give name of establishment and number of apartment or room):

3. Please check the blank below opposite the phrase that best describes the building in which you are currently living (describe its current status only):

_____ Single-family detached house (a house occupied only by one family and their occasional, nonpaying guests).

_____ Guest house (a house occupied only by one family and their paying guests).

_____ Duplex (two-family house).

_____ Apartment building (contains three or more housing units; unlike a motel or hotel, each housing unit has its own cooking facilities).

_____ Motel or Hotel.

_____ Other (specify): _____

4. Please note your own age and sex in the blanks below:

Age: _____ years

Sex: _____ Male _____ Female

PART B: HOUSEHOLD CHARACTERISTICS

NOTE: The next several questions are about you and the other people (if any) who are currently living in the same house, apartment, or room with you. This group of people is called a household. The place where you all live, distinct from other people's living quarters, is called a housing unit. A single-family house is a housing unit. A room in a motel or hotel is also a housing unit.

5. How many people, including yourself, are living in your housing unit (house, apartment, room, etc.) today? (If you are a member of a family operating a guest-house, include all guests currently staying there. If you are a guest in a guest house, motel, or hotel, include only the persons living in your room. If you are living alone, enter the number "1" in the blank below.)

Number of persons: _____

6. Please fill out one of the following lines for each of the persons counted in question 5 above (guessing ages where necessary). (If you are living alone, fill out only the first line for yourself.)

<u>Person No.</u>	<u>Age</u>	<u>Sex</u>		<u>Person No.</u>	<u>Age</u>	<u>Sex</u>	
		<u>M</u>	<u>F</u>			<u>M</u>	<u>F</u>
1 (self)	___	-	-	9	___	-	-
2	___	-	-	10	___	-	-
3	___	-	-	11	___	-	-
4	___	-	-	12	___	-	-
5	___	-	-	13	___	-	-
6	___	-	-	14	___	-	-
7	___	-	-	15	___	-	-
8	___	-	-	16	___	-	-

7. Please check the blank below which best describes your position in your household:

- parent
 husband or wife
 grandparent
 son or daughter
 other relative (specify relationship to head of household): _____

 guest, non-relative
 living alone
 other (specify): _____

8. Do you consider yourself to be:

- year-round resident
 summer resident (here for more than 30 days)
 vacationer (here for 30 days or less)
 other (specify): _____

9. How many people living in your household today (including yourself) would you consider to be:

	No.
Year-round residents	_____
Summer residents (here for more than 30 days)	_____
Vacationers (here for 30 days or less)	_____
Other (specify): _____	_____

10. Please check the blank below which best describes the legal interest of yourself or the head of your household in your housing unit:

_____ Own (including mortgage)

_____ Rent or lease

_____ Land contract

_____ Other (specify): _____

_____ Don't know

11. Please check the blank or blanks below which best describe the employment status of the head of your household:

_____ Self-employed full time

_____ Self-employed part time

_____ Employed full time

_____ Employed part time

_____ Retired

12. Please enter in the blanks below the number of vehicles of each type which are currently being operated in Harwich by members of your household:

	No.
Automobiles	_____
Trucks, buses	_____
Motorcycles	_____
Motorboats	_____
Other (specify):	_____

PART C: RECREATION SURVEY

13. Please check one of the three blanks for each of the activities listed below, according to whether it is done frequently (at least once a month), seldom (less than once a month), or not at all, by any person living in your housing unit:

	<u>Frequently</u>	<u>Seldom</u>	<u>Not at all</u>
Ocean swimming or beaching	_____	_____	_____
Pond swimming or beaching	_____	_____	_____
Salt-water fishing	_____	_____	_____
Fresh-water fishing	_____	_____	_____
Boating:			
Sailing, salt-water	_____	_____	_____
Sailing, fresh-water	_____	_____	_____
Motor, salt-water	_____	_____	_____
Motor, fresh-water	_____	_____	_____
Picnic	_____	_____	_____
Hiking	_____	_____	_____
Horseback riding	_____	_____	_____
Camping	_____	_____	_____
Golf	_____	_____	_____
Water Skiing	_____	_____	_____
Surfboarding	_____	_____	_____
Miniature golf	_____	_____	_____
Bowling	_____	_____	_____
Bird watching	_____	_____	_____
Shuffleboard	_____	_____	_____

	<u>Frequently</u>	<u>Seldom</u>	<u>Not at all</u>
Park bench sitting	_____	_____	_____
Tennis	_____	_____	_____
Movies	_____	_____	_____
Plays	_____	_____	_____
Dancing	_____	_____	_____
Other (specify):			
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

PART D: OPINION SURVEY

NOTE: The next several questions are concerned with your opinions about Harwich, present and future. You can answer either "yes," or "no", or "no opinion". There is space for recording any brief statements you may wish to make regarding any of the questions.

14. Do you favor more industrial development in Harwich, provided it doesn't pollute the air, the water, or the land?

_____ Yes _____ No _____ No opinion

Remarks: _____

15. Do you favor more shopping centers, like the one by the Post Office in Harwichport?

_____ Yes _____ No _____ No opinion

Remarks: _____

16. Do you favor more single-family, house-on-a-lot subdivisions?

_____ Yes _____ No _____ No opinion

Remarks: _____

17. The Harwich By-laws presently establish a minimum lot size of 15,000 square feet. Do you favor new zoning districts in some areas which would have a minimum lot size of 20,000 square feet (about 1/2 acre)?

____ Yes ____ No ____ No opinion

Remarks: _____

18. Do you favor new zoning districts in some areas which would have a minimum lot size of 40,000 square feet (about 1 acre)?

____ Yes ____ No ____ No opinion

Remarks: _____

19. Do you favor new zoning districts in some areas which would have a minimum lot size of 80,000 square feet (about 2 acres)?

____ Yes ____ No ____ No opinion

Remarks: _____

20. Do you favor making more land available for commercial activities?

____ Yes ____ No ____ No opinion

Remarks: _____

21. Do you favor more public access to more beaches and water areas for recreation purposes?

Yes No No opinion

Remarks: _____

22. Do you favor having controlled, well-managed trailer camps in Harwich?

Yes No No opinion

Remarks: _____

23. Do you favor having special areas set aside for commercial recreation, such as go-carts and golf driving ranges?

Yes No No opinion

Remarks: _____

24. Do you favor the development of a system of recreation and conservation areas that would be continuous throughout Harwich and would connect to all residential areas?

Yes No No opinion

Remarks: _____

PART E: LIBRARY SURVEY

25. Do members of your household use a library or libraries in Harwich?

_____ Yes _____ No

26. If the answer to the previous question was yes, please note the library or libraries used on the lines following:

Name of library (libraries): _____

NOTE: The Harwich Planning Board greatly appreciates your completion of this form. It may be returned to the person who gave it to you, or to the Town Hall in Harwich Center. Thank you.
