THE BOSTON SOUTH SHORE AREA
SOME PROBLEMS and CONFLICTS

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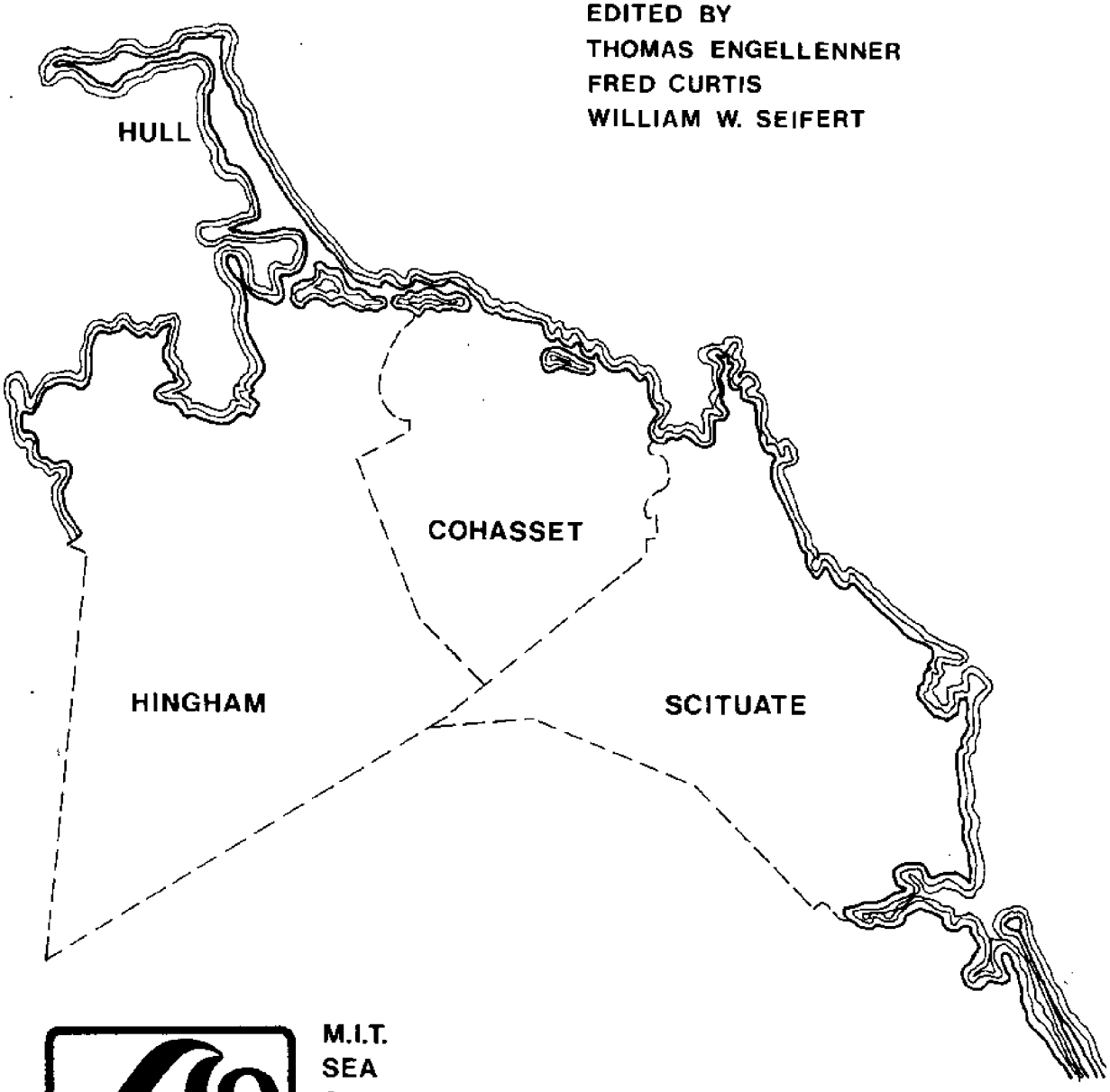

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THE BOSTON SOUTH SHORE: SOME PROBLEMS AND CONFLICTS

A report based on an interdepartmental student project in systems engineering at the Massachusetts Institute of Technology, Spring Term, 1975

Edited by:

Thomas Engellenner
Fred Curtis
William W. Seifert

This report describes the results of research done as part of the M.I.T. Sea Grant Program with support from the Office of Sea Grant in the National Oceanic and Atmospheric Administration, United States Department of Commerce, through grant number 04-6-158-44007, and from the Massachusetts Institute of Technology.

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Preface

Each year a group of students taking the M.I.T. subject "Projects in Systems Engineering" explores a different, broadly defined problem of current interest. This book describes the study initiated by such a group in Spring Term 1975. The students, whose names are given below, were drawn from several departments at M.I.T. and from the School of Law, Boston University, as you will note.

Fred Curtis	Environmental Engineering Program, M.I.T.
C. M. Dalvi	Department of Ocean Engineering, M.I.T., S.M. Program
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Jim Osborn	Department of Civil Engineering, M.I.T.

Because the effort receives support as one element under a grant from the Sea Grant Program of the National Oceanic and Atmospheric Administration (NOAA), an ocean or coastal zone related topic was sought.

During the Spring Term 1973 study, students developed modeling and gaming techniques for appraising alternative approaches for alleviating some of the problems facing the coastal region of Maine. During the 1974 Spring Term, another group examined conditions in the harbor area of the City of Gloucester, Massachusetts, and made a series of recommendations for steps that might be taken to encourage effective development of the area.

During the fall of 1974, as the time approached for selection of a project for the 1975 Spring Term, Captain Thomas Suddeth of Cohasset asked if I felt an appraisal of policies that Cohasset might take to channel its development so as to achieve an appropriate balance between protection of the environmen-

tal qualities of the town and maintenance of economic viability would be an appropriate subject for investigation.

After a series of discussions with Captain Suddath, with Ms. Martha Reardon of the South Shore Chamber of Commerce, and others, the decision was made to expand the scope of the study to include an examination of the towns of Cohasset, Hingham, Hull, and Scituate.

The class benefited greatly from its meetings with Captain Suddath and Ms. Reardon, and from a discussion and slide presentation given by Mrs. Wendell J. Leary and Ms. Margaret Dillon of Cohasset, and also from conversations with numerous other citizens of the South Shore area. The students also appreciated the opportunity to hear from Mr. Marc Kaufman about the status of the Massachusetts Coastal Zone Management Program and from Professor Carl Steinitz of Harvard University concerning his extensive study of another group of communities south of Boston.

I should also like to acknowledge the valuable guidance and insights provided by Professor David Rice of the School of Law, Boston University. He first encouraged the Boston University students to join in the study and then supervised their efforts.

Finally, this effort has received the continuing support of Mr. Dean Horn, who at the time of this study was Executive Officer of the M.I.T. Sea Grant Program and has since been made its director. The editorial effort required to reduce the results of the student study to report form and preparation of the final manuscript were supported jointly by the NOAA Office of the Sea Grant, Grant No. 04-5-158-1, 1974-1975 project element and the Henry L. and Grace Doherty Charitable Foundation, Inc.

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May 1977

Contents

Chapter One

THE SOUTH SHORE IN TRANSITION

CHAPTER 1 The South Shore in Transition

PHYSICAL GEOGRAPHY

The study area lies on the edge of the Boston Basin -- a giant, mostly submerged depression formed millions of years before the Ice Age when a large section of land sank in response to the shifting of the Earth's crust. The ancient fault line cuts across the South Shore (see Fig. 1-1) separating the lowlands of Hingham Harbor and Hull from the ridges of southern Hingham and Cohasset. When the glaciers arrived they left their own unique impressions in the form of drumlins, smooth rounded deposits of glacial till that form the hills and islands of the Boston Harbor area.[1] The Hull peninsula, which extends seven miles into Boston Harbor, is a series of drumlins connected by sand bars and man-made causeways. Wetlands cover a large portion of the remaining, low lying terrain particularly along Hingham Harbor, the Weymouth Back and Weir Rivers. The most notable feature of the Basin Lowlands, however, is the Atlantic side of the Hull peninsula where Nantasket Beach embraces nearly four miles of ocean surf. It is both the widest and the longest unbroken beach of the study area.

The seascape changes drastically beyond Hull and outside the confines of Boston Harbor. Here Massachusetts' last granite outcropping meets the sea along the rocky cliffs of Cohasset. Thoreau once described the Cohasset coast as "the rockiest shore in Massachusetts -- hard, sienitic rock which waves have laid bare but have not been able to crumble."[2] There are few places in Cohasset or sourthern Hingham where the soil is not shallow or punctured by the bedrock. Although the soils are rocky, they once supported dense forests. Much of this has given way to residential development with the exception of a few areas maintained by the government or conservation groups. The coastal cliffs which terminate at the eastern headland of Cohasset

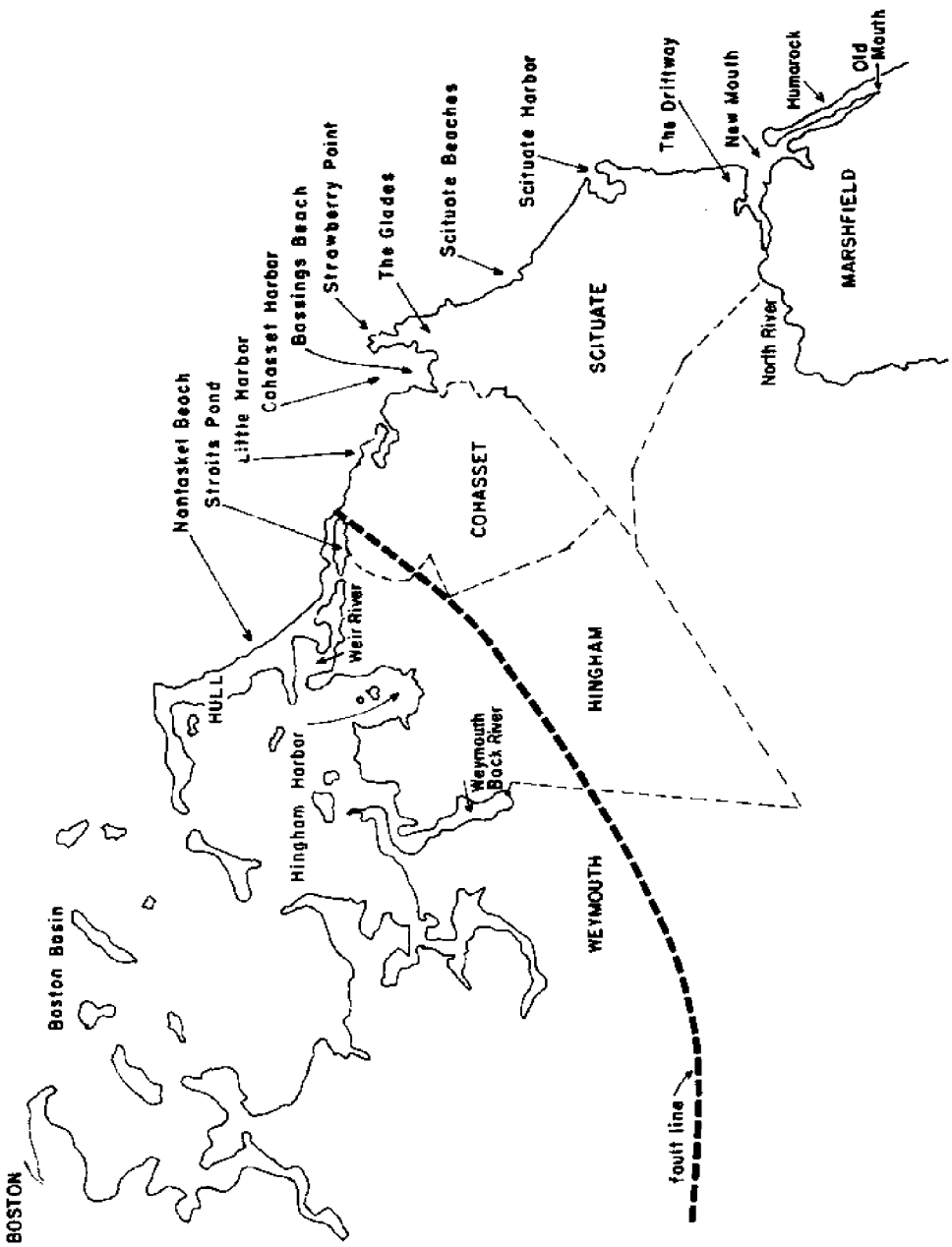


FIGURE 1-1: Geographic Features

Harbor are broken by two salt water ponds, Straits Pond and Little Harbor. West of Cohasset Harbor lies an extensive marsh known as the Glade and the virtually unused Bassing Beach.

Past Strawberry Point, the western headland of Cohasset Harbor, the Scituate coast dips south changing from rock ledge to sandy beaches. The beach, however, is broken in numerous places where erosion has raised fragile cliffs. Scituate Harbor is the study area's third major harbor and is located about two-thirds of the way down the Scituate shore. Inland, the soils are deeper and richer than those of its northern neighbors, although farming, like forestry, has been largely displaced by housing.

The North River, Scituate's southern boundary, is the study area's largest waterway and one of the few unscathed estuaries that remain in southeast New England. The driftway region near the river's mouth is also an important aquifer and recharge area for water supply. Humarock, the final stop on the geographic itinerary, is a long, narrow barrier beach off the coast of the Town of Marshfield. Once a peninsula extending from Scituate, it was separated from the town when the North River broke through its banks in 1898. Since then, the old mouth has filled in, making Humarock physically part of Marshfield but still under the political auspices of Scituate. Almost the entire coast of Humarock is sandy beach, but there are serious erosion problems and the ever present possibility of severe damage from coastal storms.

HISTORIC DEVELOPMENT[3]

Home rule is deeply engrained in the study area. For Hingham, Hull, and Scituate the tradition goes back over 350 years. Cohasset is a relative newcomer, not being separated from Hingham until 1770.

Although the Cohasset Harbor area was reportedly visited by Captain John Smith in 1614 while on an exploratory mission from the Virginia colony, settlers did not arrive until the New England colonies were established. Control of the South Shore, particularly of the cattle-feed of Cohasset Harbor's salt marshes, became a divisive issue between the Plymouth and Massachu-

setts Bay colonies until settled by a line which remains unchanged as the Cohasset-Scituate boundary.

By the time of the revolution, the four towns were firmly established. Fishing and farming were the primary occupations, although shipbuilding also flourished in Hingham Harbor and the North River. The early industrialization of New England, however, passed by the South Shore for lack of swift-flowing waterways.

The isolation was accentuated by transportation problems. Travel to Boston by land was slow and stage coach service sporadic. The introduction of steam boats in the early 1800s helped by shortening the travel-time to Boston, but it was not until the opening of the Old Colony Railroad line in 1849 that the South Shore was truly linked with the metropolitan area. The railroad stimulated farming and non-water power manufacturing by providing quick and inexpensive transportation of local goods and produce to the market places of Boston. The bustling economy also attracted new residents, many of which were recent immigrants. By the turn of the century modest communities had developed around each station of the Old Colony line.

By 1900 another result of the railroad was noticeable -- the rise in summer visitors. The beaches of the South Shore were becoming resort towns. Old-fashioned boarding houses for weekends or part of the summer were particularly prevalent along Nantasket. Those who could afford it built summer homes. Cottages sprang up throughout Hull and Humarock. Many of the affluent chose the cliffs of Cohasset for their homes but estates could be found throughout the study area. The "Estate Era" came to an end shortly after World War II, perhaps because the auto and airplane made other areas of the world more accessible, but more likely because of the intense development pressures of the post World War II era.

POST WAR DEVELOPMENT

At the end of World War II, there was, by one estimate, a need for over five million new units of housing in America.[4] The manifest reasons were the

low priority of housing construction during the war effort and the increase in family units as veterans returned, married, and settled down. The Boston area, like other metropolitan areas, felt particularly hard pressed -- the greatest demand for housing was near jobs or educational facilities and Boston had both.

At the same time a silent, but certain, national policy to decentralize American cities appears to have emerged. Cities had always grown at their edges, adding on new rings like a tree, but the postwar development was different, both in scale and in philosophy. Almost overnight the single-family home became the American dream.

There were many strong desires that gave impetus to suburbia: getting away from crime and unsanitary conditions that many associated with high density living; owning rather than renting and the security it brought; providing a better environment for the children; and enjoying the semi-rural atmosphere.

At the same time there were many government inducements. There were VA loans, mortgage interest and property tax deductions from income taxes, regional highway systems to suburbia, and aggressive destruction of urban neighborhoods in the name of renewal.

By the time the Route 3 connection from Hingham to the Southeast Expressway was completed in 1959, the South Shore was well on its way to suburbanization. From 1940 to 1950 the population of the study area grew by 37 percent, while the metropolitan area grew by 0.8 percent. From 1950 to 1960 the four communities added another 66 percent compared to 9.0 percent for Greater Boston. (See Table 1-1)

In the first few years after the war the housing industry had responded slowly to the great demand for homes. Nationwide there were problems of capitalization and converting the small-time, less-than-ten-houses-a-year companies into effective large-scale developers. By 1950, however, the housing industry, sparked by Levitt's successes on Long Island, had created the mass production home.[5] As a result, the modern subdivision was born.

During the decade from 1950 to 1960 over 3,000 building permits for new homes were granted by the four communities (See Table 1-2) The homes built

TABLE 1-1

POPULATION GROWTH

	1940	1950	1960	1970	% Change 1940-70
Hingham	8,003	10,665	15,378	18,845	135
Hull	2,167	3,379	7,055	9,961	360
Cohasset	3,111	3,731	5,840	6,954	124
Scituate	4,130	5,993	11,214	16,973	311
Total	17,411	23,768	39,487	52,733	202
Metropolitan Boston	2,350,514	2,369,986	2,595,481	2,753,700	17

Sources: U.S. Census of Population 1940, 1950, 1960 and 1970.

TABLE 1-2

BUILDING PERMITS FOR NEW HOMES

	1950-54	1955-59	1960-64	1965-69	1970-74	Total
Hingham	664	454	531	522	379	2,550
Hull	455	145	54	57	29	711
Cohasset[1]	NA[2]	NA	160	132	118	--
Scituate	932	643	588	455	333	2,951
Total	--	--	1,333	1,166	859	--

1. Prior to 1972 Cohasset did not have a building code. Figures are based on plumbing reports to the State Board of Health.

2. Prior to the State Plumbing Code in 1960 there was no permit requirement in Cohasset.

Sources: Annual Town Reports; City and Town Monographs; Massachusetts Department of Commerce and Development; Housing Construction Statistics; U.S. Census Bureau.

were typically on small lots (one-half or one-quarter acre) and within walking distance of the ocean or town centers. The most recent Federal census of housing provides a second indicator of the magnitude of the building boom of the 1950s. It reveals that 21 percent of all homes in the study area were built in that decade (see Table 1-3). The data also reveal the fact that over half (51 percent) of local housing was built from 1940 to 1970, while metropolitan-wide these three decades accounted for only 30 percent of housing.

TABLE 1-3

AGE OF HOUSING

	1939 or earlier	1940-49	1950-59	1960-69	Total
Hingham	2,528	605	1,038	1,085	5,301
Hull	1,873	393	559	426	2,972
Cohasset	1,194	171	426	386	2,177
Scituate	1,851	548	1,163	1,141	4,703
Total Study Area	7,446	1,717	3,231	2,759	15,153
Percent of Total Housing	49%	11%	21%	19%	100%
Metropolitan Boston	568,752	72,406	124,240	125,583	890,981
Percent of Total Housing	64%	8%	14%	14%	100%

Source: U.S. Census of Housing 1970.

The decade from 1960 to 1970 continued many of the trends of the fifties (local population increased 34 percent while the Boston SMSA grew only six percent), but also revealed changes. Nationwide, the decade marked a turning point; for the first time the total population of the suburbs exceeded the

population of the central cities. The increase in suburban representatives at the statehouses and congress triggered a crusade to develop a local ability to deal with growth. With the help of Federal funds, comprehensive plans were commissioned and the housing industry became "regulated"; there were wetland permits, subdivision approvals, site plans, building inspectors, plumbing inspectors, wire inspectors and so on.

Nevertheless, the housing boom continued. New building permits granted in the study area from 1960 to 1970 numbered 2,499, and the homes built accounted for 18 percent of the existing housing stock. The most noticeable change in the homes of the sixties was size -- bigger homes on bigger lots. A quick succession of town zoning amendments placed large areas in zones which required 40,000 square feet for each lot.

The sixties also revealed a marked increase in the conversion of South Shore summer homes to full-time residences. This phenomenon was particularly prevalent in places such as Hull and Humarock where large numbers of summer homes already existed and little vacant land remained. The number of conversions is hard to quantify because permits were not always required or sought even if required. As an example, in the 1960-1970 period, the population of Hull grew by 2,906 but only 111 new home permits were granted.

Today the housing industry along the South Shore is still growing. Some developments have leapfrogged over the more expensive, vacant parcels in the study area for the cheaper, less regulated land further south. Construction starts have been delayed by the economic slump and high interest rates, but recent Federal housing legislation should stimulate the industry. Both Hull and Scituate are considering measures to slow the conversion of summer homes but strict enforcement of building codes is likely to be politically unfeasible. In summary, residential construction this year will probably be greater than in the past two years but the constraints of less vacant land and stricter regulation indicate that the number of additional dwellings will not be as great as in the peak years of the early sixties.

SELECTED DEMOGRAPHIC CHARACTERISTICS

The South Shore is a haven for families. The latest Census data reveals 43 percent of the population is under 19. Likewise, there is a disproportionately high number of residents within the 30 to 45 age group, the prime child raising years. A comparison of 1960 and 1970 Census figures reveals that inmigration of established families has maintained these figures -- the percent of the population under 19 throughout the last decade has remained constant despite declining birth rates. A final indicator of the "family" nature of the four towns is the dependency ratio (the ratio of the population under 19 or over 65 to the population 19 to 65). The study area had an average ratio of 1.03 which compared with 0.88 for the metropolitan area (see Table 1-4).

The flight of families to the South Shore is almost entirely a white flight. While we make no pretense of having studied the issue of racial segregation extensively, much less of having uncovered a solution, we note that the study area is 99.3 percent white. While this relatively common suburban phenomenon may be the result of threats or seller's conspiracies, it is more easily explained by simple economics: few blacks or other minorities can afford homes within the price range of these communities and, furthermore, few are willing to pay as much as a white buyer for the opportunity of settling there.

According to the 1970 Census of Housing, the median price asked for homes then on sale in Scituate was $31,100 and in Hingham $40,800. Although figures were not available for the other two towns,we can assume that the median for Hull was slightly lower and the Cohasset median slightly higher, keeping the average around $35,000.

Given the recent rate of inflation, it is not unreasonable to assume the 1975 average asking price for the South Shore homes to be around $40,000. At this price, who can afford to move into these towns? A $40,000 home with a 20 percent down payment would require $32,000 financing. Assuming a 25-year, 8.5 percent mortgage rate, yearly payments would amount to $3,127. Present full value tax rates in the four communities vary from $43 to $88 per thousand. Assuming an average tax rate of $65/1,000, the would-be

TABLE 1-4

1970 POPULATION - AGE DISTRIBUTION

Age Group	Hingham	Hull	Cohasset	Scituate	Total	Metropolitan Boston
<5	1,680	906	516	1,632	4,734	218,437
5-9	2,185	1,158	736	2,226	6,305	251,716
10-14	2,353	1,225	903	2,325	6,806	261,665
15-19	1,810	961	642	1,599	5,012	250,438
20-24	920	716	335	741	2,712	242,497
25-29	970	619	334	860	2,783	187,522
30-34	1,030	496	338	997	2,861	143,018
35-39	1,196	534	423	1,121	3,274	144,725
40-44	1,280	589	566	1,172	3,607	160,734
45-49	1,284	571	421	1,045	3,321	163,630
50-54	1,031	573	423	835	2,862	154,394
55-59	880	492	365	630	2,367	140,650
60-64	681	379	288	507	1,855	125,389
>65	1,565	742	665	1,283	4,255	309,885
<20	8,007	4,250	2,797	7,772	22,826	982,301
(<20)+(>65)	9,572	4,992	3,462	9,055	27,081	1,292,186
20-65	9,272	4,969	3,493	7,918	25,652	1,462,559
Dependency Ratio	1.03	1.00	0.99	1.14	1.06	0.88

Source: U.S. Census of Population, 1970

homeowner would be paying $2,080 a year in taxes. The total yearly cost excluding all the incidentals such as insurance, utilities, etc. would run $5,207 a year.

It is generally said that housing costs should not exceed 25 percent of the occupant's income. Working backward with these known costs, it is obvious that the average newcomer must have a yearly income of $20,828 to settle here. This figure is at odds with the present income levels of the inhabitants. In fact more than one-half of the families living in the study area would be excluded from the present market!

The 1970 income levels of the families and unrelated individuals in the study area are shown in Table 1-5. Median income levels varied from $13,123 for Cohasset to $9,397 for Hull, and each median was above the metropolitan average. While median income gives a good approximation of salaries earned, this figure does not reveal the actual standard of living because of differences in family size. In this respect per capita income is a better indicator, and Figure 1-6 reveals a considerably higher percentage variation (38% vs. 28%). While the total study area's per capita income was above the metropolitan average, Hull was below and Scituate only equal to this standard.

Poverty, as defined by the Federal Government, is shown in Table 1-6. The Census Bureau's standard is based on a sliding scale ranging from incomes of less than $1,600 for an individual to less than $7,800 for a family of four. According to the 1970 figures 5.2 percent of the local population is below the federal standards.

The residents of the study area are employed in a wide spectrum of occupations and this range closely approximates the metropolitan distribution (see Table 1-7). The largest differences were in the professional, managerial, and sales categories where the four communities had more than the Greater Boston average,and in the clerical and operative categories where they had less. Sociologists have often classified workers by grouping professional, managerial, service, clerical and sales occupations into one class and all others into a second group. To the extent that white collar/blue collar distinctions have

TABLE 1 - 5

1970 INCOME OF FAMILIES AND UNRELATED INDIVIDUALS

Income Bracket Dollars	Hingham	Hull	Cohasset	Scituate	Total	Metro
Under 3,000	3.6%	7.8%	2.7%	4.2%	4.5%	6.1%
3,000 - 5,999	6.2	12.5	6.0	7.8	7.9	10.8
6,000 - 9,999	17.2	24.3	15.8	15.9	17.9	23.2
10,000 - 14,999	27.4	30.8	25.7	31.8	29.2	29.8
Over 15,000	45.6	24.6	49.8	40.3	40.5	30.1
Median	$12,729	$ 9,397	$13,123	$12,194	-	$11,449
Per Capita	4,251	3,120	5,022	3,713	$ 3,908	3,713
Average	16,546	11,979	18,956	14,731	15,417	13,284

Source: U.S. Census of Population, 1970

TABLE 1-6

POVERTY INDICATORS

	Hingham	Hull	Cohasset	Scituate	Total	City of Boston	Metropol. Boston
No. of families below poverty level	164	186	30	168	548	16,624	40,236
Percentage of all families	3.6%	8.2%	1.8%	4.2%	4.4%	11.7%	6.1%
Unrelated individuals below poverty level	244	121	112	191	668	33,720	79,908
Percentage of all unrelated individuals	27.3%	21.1%	26.8%	25.2%	25.4%	30.7%	28.8%
Total persons below poverty level	876	823	186	858	2,743	99,262	228,233
Percentage of all persons	4.7%	8.3%	2.7%	5.1%	5.2%	16.2%	8.5%

Source: U. S. Census of Population, 1970

any relevance, we note the study area is 77 percent white collar as compared with 72 percent for the metropolitan region.

ECONOMIC BASE

If the term "bedroom community" is ever appropriate, the study area is aptly described by it. According to 1970 statistics only 29 percent of local workers could find employment within their own town (see Table 1-8). Although local employment has risen from 6,713 to 8,553 since 1970 (see Table 1-9), a similar rise in the size of the local work force maintained the pattern of low local employment.

The pattern is not surprising, given the occupational status of the residents (discussed previously) and the present location of jobs in the metropolitan region. Since a large portion of the residents pursue professional or managerial positions, commuting to the center cities or the office parks of the Route 128 beltway is a necessity. Table 1-8 also indicates that 25 percent of total work force commutes to the City of Boston and that this figure varies from a high of 33 percent of the work force for Cohasset to a low of 21 percent for Scituate.

Another facet of the employment picture which Table 1-8 discloses, is the importance of the South Shore region as a source of jobs. Roughly one-half of the total work force is employed in the adjoining towns of Norfolk and Plymouth counties that are loosely defined as the South Shore. While a large portion of these jobs are concentrated in the industrialized communities (i.e. Weymouth and Quincy) that lie between the study area and Boston, the importance of an emerging identity should not be ignored. The South Shore Chamber of Commerce (SSCC) has been a primary motivating force in this regard. One of the outstanding achievements of the SSCC has been the development , in cooperation with Norfolk county, of a Computerized Industrial Land Inventory. The inventory project, which was recently praised by the National Association of Counties, is a compilation of all industrially zoned parcels larger than two acres with a comprehensive analysis of industrial value parameters such as

lot size, topography, available sewers and water, assessed valuation and taxes, rail siding, distance from main routes and airports, adjacent land available, buildings and size of buildings, owners, contours, and other characteristics of the land. The South Shore as a region (although not necessarily the four towns of our study area) shows a strong potential for industrial development. The available labor force and good transportation access to the region are grounds for optimism, although some manufacturers interviewed felt that the region's lack of skilled and semi-skilled operatives was a constraint.

The scope of local industrial activities and recent trends in local employment are indicated in Tables 1-9, 1-10, and 1-11. The percentage of the workforce self-employed within the study area was higher than the national and state averages. Local government was the largest single employer in each of the four towns. After local government, wholesale and retail stores, which were the next largest local employers, accounted for nearly half of the total local employment and showed the greatest increases for the 1967-1973 period. Because there is a strong correlation between population growth and increases in the wholesale and retail sectors, this trend can be expected to continue as long as population continues to rise. A similar correlation can be found between growth and the service sector. Contract construction was the most volatile employment, being influenced by mortgage rates and availability of money. Manufacturing showed the second largest growth rate (61 percent in the 1967-1973 period), with most of the new industrial jobs generated in Hingham. At present, Hull has no industrial employment at all, largely due to its inaccessibility and lack of suitable land. Hingham appears to have the strongest potential for industrial expansion because of its rail access and nearby docking facilities on the Weymouth Back River. Only Hingham has any extractive industry, although the study area is rich in sand and gravel. Protective zoning and nuisance laws have effectively curtailed such enterprises in the other communities. Agriculture has also been curtailed; the controlling force here being the housing market and soaring property taxes. Even with the recently adopted farmland tax abatement, the prospects for continuing

TABLE 1-7

OCCUPATIONAL DISTRIBUTION

	Hingham	Hull	Cohasset	Scituate	Total	Metropolitan Boston
Professional	1,515	566	614	1,469	4,164	
%	22.2	16.1	24.6	24.4	22.1	20.0
Managerial	1,207	397	464	863	2,913	
%	17.7	11.3	18.6	14.4	15.6	9.0
Service	639	537	290	643	2,109	
%	9.4	15.2	11.6	10.7	11.2	11.9
Clerical	1,139	601	354	994	3,085	
%	16.7	17.1	14.2	16.5	16.4	22.9
Sales	782	302	303	749	2,136	
%	11.5	8.6	12.2	12.5	11.3	7.7
Craftsmen	717	630	235	658	2,240	
%	10.5	17.9	9.4	10.9	11.9	11.6
Operatives	552	370	108	365	1,395	
%	8.1	10.5	4.3	6.1	7.4	12.8
Laborers	207	97	61	188	553	
%	3.0	2.8	2.5	3.1	2.9	3.4
Private House-hold Worker	62	23	62	82	229	
%	0.9	0.7	2.5	1.4	1.2	0.7
TOTAL	6,817	3,523	2,491	6,011	18,842	
%	100.0	100.0	100.0	100.0	100.0	100.0

Source: U.S. Census of Population 1970

TABLE 1-8

EMPLOYMENT PATTERNS

Employment Location	Hingham	Hull	Cohasset	Scituate	Total
% work along the South Shore[1]	53%	45%	43%	51%	49%
% work in Study Area	33%	24%	41%	38%	34%
% work in Own Town[2]	32%	22%	33%	28%	29%
% work in Boston	27%	24%	33%	21%	25%
Residual	20%	31%	24%	38%	26%
Total	6,817	3,522	2,492	6,011	18,842

1. For purposes of this illustration the South Shore includes Quincy, Milton Braintree, Holbroke, Weymouth, Hull, Rockland, Cohasset, Hingham, Hanover, Norwell and Scituate.

2. Included unemployed workers and workers who are employed in areas other than the City of Boston or the South Shore.

Sources: "South Shore Business Review", South Shore Record, Wednesday, April 23, 1975; Current Employment Series, U.S. Bureau of Labor Statistics, 1975.

TABLE 1-9

LOCAL EMPLOYMENT

Town	Number of Firms	Total Employment[1]	% of Total Average Annual Employment				
			Agriculture & Fishing	Contract Construction	Manufacturing[2]	Services[3]	Wholesale & Retail
Hingham	411	4,956	1.0	5.3	30.4	19.0	44.1
Hull	135	677	.3	7.4	.0	46.6	45.3
Cohasset	145	1,232	.7	3.6	6.4	36.9	52.0
Scituate	223	1,688	.4	10.6	11.4	27.4	49.9
Total	914	8,533	.8	6.2	20.7	25.6	46.6

1. Excludes government employees

2. For the purposes of this table, mining was included with manufacturing. Only one town, Hingham, had any mining and this accounted for .2% of its total employment

3. The services category includes hotels and lodging places; establishments providing personnel, business, repair and amusement services; medical, legal, engineering and other professional services; finance, insurance and real estate services; transportation, communications, electric, gas, and sanitary services

Source: Employment and Wages in Establishments Subject to the Massachusetts Employment Security Law by Major Industrial Divisions 1967-73. Mass. Div. of Employment Security (Totals may not equal details due to rounding)

TABLE 1-10

INDUSTRIAL PATTERNS 1967-73

Occupation	Average Annual Employment[1] for Study Area							% of Change 67-73
	1967	1968	1969	1970	1971	1972	1973	
Agriculture & Fishing	87	88	91	66	63	63	69	-21%
Contract Construction	463	476	454	433	424	487	534	+15%
Manufacturing	1,099	1,251	1,384	1,294	1,241	1,396	1,767	+61%
Services	1,760	1,818	1,747	1,769	1,812	1,975	2,194	+25%
Wholesale & Retail	2,400	2,703	2,955	3,169	3,173	3,460	3,984	+66%
Total Local Employment	5,809	6,336	6,631	6,731	6,713	7,381	8,553	+47%

1. Excludes Government Employees

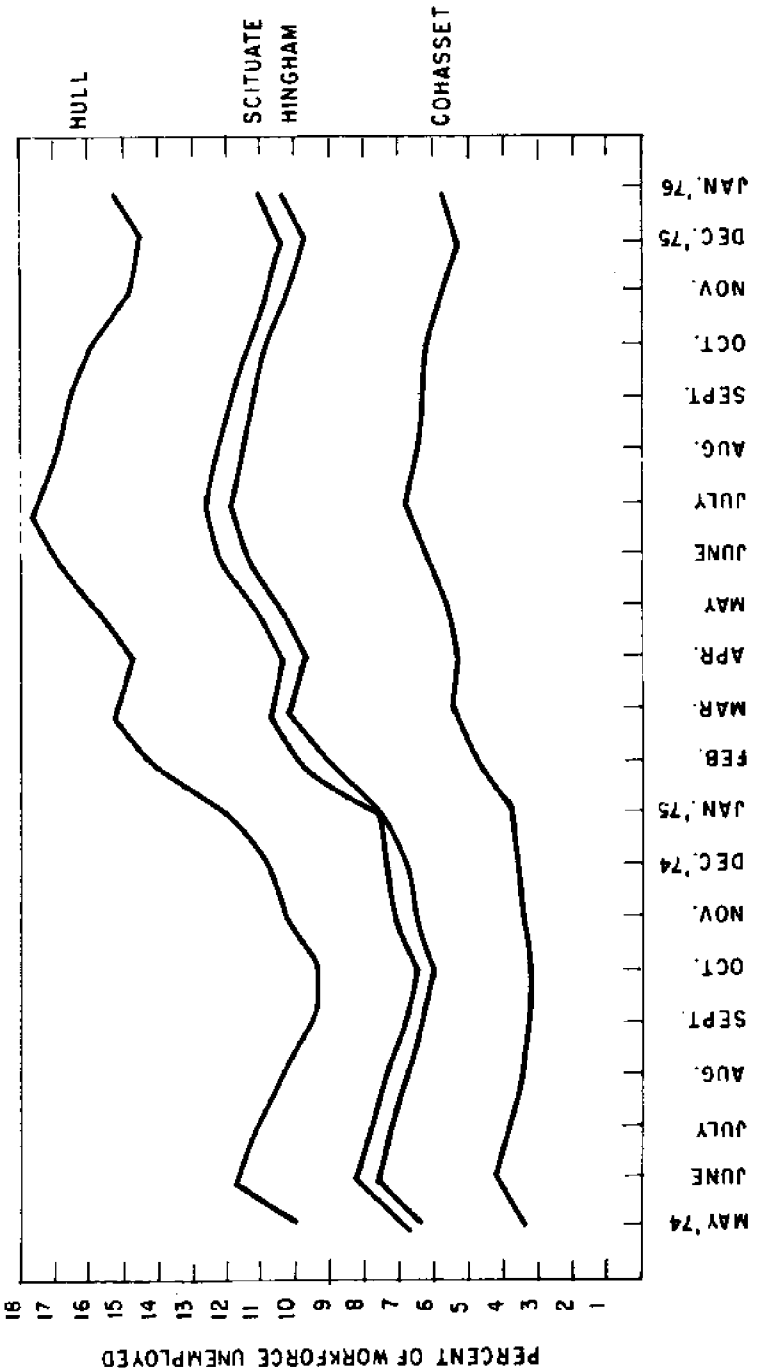
Source: Employment and Wages in Establishments Subject to the Massachusetts Employment Security Law by Major Industry Division, Mass. Division of Employment Security, 1973

TABLE 1-11

MISCELLANEOUS EMPLOYMENT DATA

Job Category	Hingham	Hull	Cohasset	Scituate	Total
Private Wage & Salary Workers	5,084	2,428	1,901	4,370	13,783
Local Gov't Workers	749	385	298	826	2,258
Other Gov't Workers	1,131	699	387	1,105	3,322
Self Employed Workers	582	377	199	520	1,678
Unpaid Family Workers	20	18	5	16	59
Total	6,817	3,522	2,492	6,011	18,842

Source: 1970 Census of Population



source: Massachusetts Dept. of Employment Security.

FIGURE 1-2: Unemployment 1974-1975

agricultural employment are overshadowed by development pressures.

Unemployment rates, as revealed by Figure 1-2, vary tremendously between the four communities. The unemployment rate for Cohasset was the lowest at approximately five percent during the first quarter of 1975. The figures for Hull during the same period show a rise to over 14 percent unemployment. One mitigating factor in Hull, however, is the fact that its economic base is almost entirely resort-recreation activity and the winter quarter reflects the ebb tide of retail and service employment.

On the optimistic side of the employment picture is the fact that the South Shore has been the leading participant in the Massachusetts On-the-Job Training program (OJT). The training program is part of the Federal Comprehensive Employment Training Act (CETA) and has been administered by the South Shore Chamber of Commerce. According to Mr. Davis of SSCC, the South Shore region placed 114 out-of-work persons in OJT positions between October 1974 and June 1975. This surpasses all other regions, including Boston, which filled only 109 positions. Likewise, the average pay for South Shore OJT was $3.67 per hour, the highest in the state.

While OJT is certainly not the panacea for unemployment within the study area, it is an indicator of a healthy industrial base capable of growth if properly stimulated.

PRESENT LAND USE

In 1971 an aerial survey of the Commonwealth was conducted and has been used to provide some rough approximations of the study area's current land use. Although the original data was collected by Professor Conell of the University of Massachusetts as part of a forestry study, the Metropolitan Area Planning Council (MAPC) has also analyzed the data and categorized the land in terms of activities (i.e. extractive industries, forestry and saltwater wetlands). In Figure 1-3 we have further simplified the classification scheme and presented the data in slice-of-the-pie form as a means of comparison[6]. The size of each pie corresponds to a comparative land area of the town it represents.

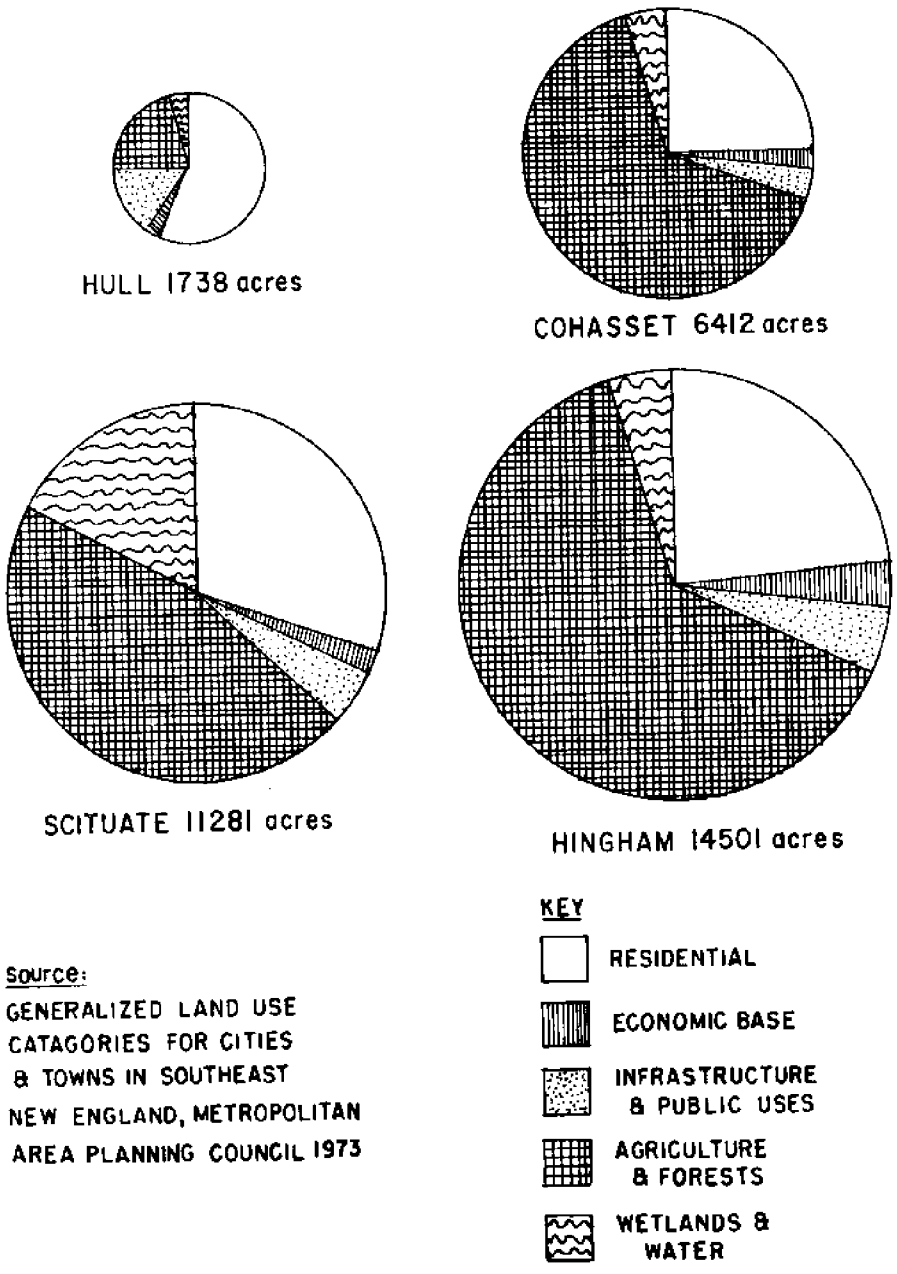


FIGURE 1-3: Present Land Use

Although the data provide only a rough approximation (forest land appears to be overrepresented) the "bedroom community" nature of the study area is further documented. Economic activities consume a very small portion of the land, while a quarter to a half of each town is devoted to residences. The size of individual homes, however, varies considerably from town to town. As Table 1-12 indicates, in Cohasset 73 percent of the residential land is devoted to homes larger than one-half acre, while in Hull 2 percent of the residential land is so "open".[7]

TABLE 1-12
LOT SIZES

Percentage of Residential Land Devoted to Homes	Hingham	Hull	Cohasset	Scituate	Total
Less than 1/2 acre	73%	98%	27%	65%	65%
More than 1/2 acre	27%	2%	73%	35%	35%

Source: Generalized Land use Categories, MAPC, Boston, Mass., 1973

Table 1-13 reveals a number of major differnces between the study area and the Boston region in terms of type of housing and ownership. Almost 15 percent of the study area's homes are seasonal homes as compared with 0.6 percent for the region. The bulk of the "summer housing" stock, however, is concentrated in Hull (36.4%) and Scituate (16.1%) with Hingham and Cohasset more closely approximating the regional proportion. The vast majority of housing units within the four towns are single-family homes (86.9%), while the percentage of such for the Greater Boston Region is only 43.7 percent. The proportion of owner-occupied structures shows strong correlation to the single-family home patterns. That is, the study area shows a higher percentage (81.8%) of owner-occupied dwellings than Metropolitan Boston (50.8%). The pattern for individual towns did not vary significantly from the total figures for the study area. The percentage of single-family dwellings varied from 78.2 percent for

TABLE 1-13

GENERAL HOUSING CHARACTERISTICS

	Hingham	Hull	Cohasset	Scituate	Total	Metropolitan Boston
Total Units	5,377	4,558	2,216	5,617	17,728	896,273
Total Year-round Units	5,301	2,972	2,177	4,703	15,153	890,981
% Seasonal Homes	0.8	36.4	1.9	16.1	14.9	0.6
% Year-round Homes	99.2	63.6	98.1	83.9	85.1	99.4
% Single Family Dwellings [1]	87.3	78.2	84.6	92.7	86.9	43.7
% Multi-Family Dwellings [1]	12.4	21.7	15.4	7.3	13.0	56.1
% Mobile Homes [1]	0.3	0.1	0.0	0.0	0.1	0.1
% Owner Occupied [2]	85.7	71.6	80.0	84.4	81.8	50.8
% Renter Occupied [2]	14.3	28.4	20.0	15.6	18.2	49.2
Total Year-round Occupied	5,160	2,763	2,082	4,553	14,558	859,701

1. Percents are based on total year-round units, including those temporarily vacant due to migration.

2. Percents are based on total year-round, occupied units, thus excluding all vacant homes.

Source: 1970 Census of Housing, U.S. Bureau of the Census

Hull to 92.7 percent for Scituate. Likewise, the owner-occupied proportion ranged from 71.6 percent for Hull to 85.7 percent for Hingham.

For most residents, purchasing a home in the study area was a good investment. While the value of housing for the Metropolitan area has risen 50 percent during the last ten years, three of the four towns had even higher percentage increases. Only Hull lagged behind, with a mere 28 percent increase (see Table 1-14). It should be noted that the values reported in Table 1-14 are tainted with subjectivity, as they are derived from a Census question "What do you think your home would sell for today?". Discussions with the South Shore Board of Realtors indicated that the "going rate" for homes in Hull is about $26,000. The Greater Plymouth Board of Realtors estimated the present median value to be in the high $40,000s for Hingham, in the $50,000s for Cohasset, and in the low to middle $40,000s for Scituate (the Scituate figures being affected by a sizeable number of summer homes and converted cottages in the $18,000 - $20,000 price range). The realtors also estimated the value of homes in the study area has increased 5-10 percent in the past year.

TABLE 1-14

CHARACTERISTICS OF OWNER OCCUPIED HOMES

	Hingham	Hull	Cohasset	Scituate	Boston SMSA
1960 Median Value	$17,300	$12,900	$20,000	$16,600	$15,900
1970 Median Value	$27,400	$16,500	$32,700	$25,100	$23,800
49% change 1960-1970	58%	28%	64%	51%	49%
Median Household Size for Owner-Occupied Dwellings	3.6	3.3	3.3	3.7	

Source: 1960 and 1970 Census of Housing

As noted previously, rental housing comprises a small percentage of the housing stock. It is also 11 to 36 percent more expensive than the Metropolitan median. The units, however, are probably larger, as indicated by larger household sizes (see Table 1-15). Subsidized and public housing is very low by metropolitan standards, and it is predominately housing for the elderly built under Ch. 121B, S. 26 of the Massachusetts laws.[8]

TABLE 1-15

CHARACTERISTICS OF RENTAL HOUSING

	Hingham	Hull	Cohasset	Scituate	Boston SMSA
No. of Rental Units	722	781	403	696	405,783
Median Contract Rent	$118	$125	$144	$126	$106
Median Renter Household Size	2.6	2.9	2.0	2.3	2.1

Source: 1970 Census of Housing

Over 60 percent of the study area consists of wetlands or other conservation areas and, as Table 1-16 shows, protected by wetlands flood plain or watershed protection zoning. In addition to the police power of zoning to prohibit certain uses of such conservation lands, the towns have been acquiring large parcels by eminent domain. Table 1-16 includes compilations of the large parcels recently acquired, or proposed for acquisition, by the four towns. Although most of the acquisitions are for conservation purposes, there have been major efforts to acquire land for other future recreational needs, and, to a large extent, to integrate conservation and recreation acquisitions. Scituate has embarked on a type of land banking by purchasing at moderate prices large areas of vacant land to meet the future needs for municipal facilities. Hull's Redevelopment Authority has acquired 33 acres in order to revitalize their central business district.[9] Present plans for the renewal area call for a marina and other commercial recreational units mixed

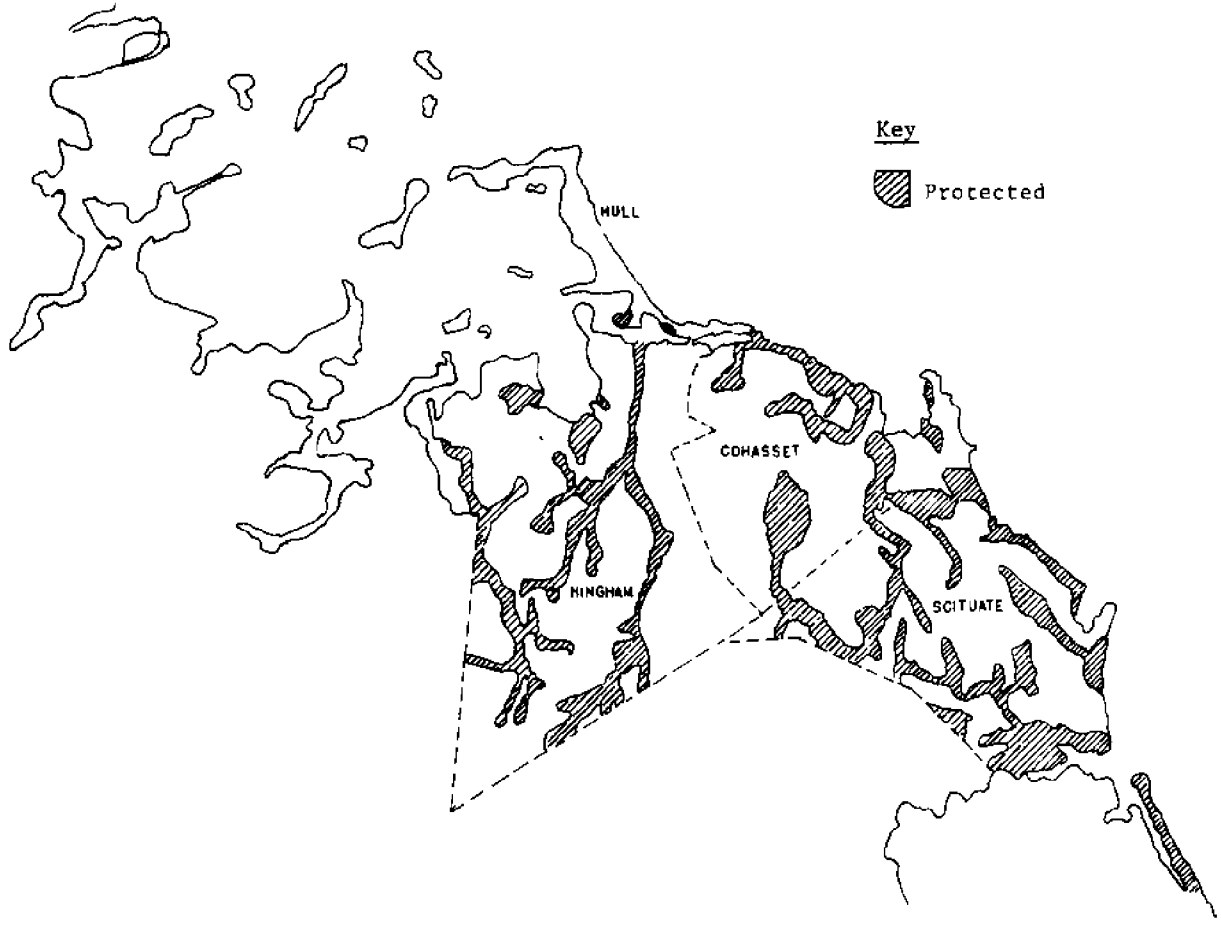


FIGURE 1-4: Protected Conservation Areas

TABLE 1-16

MAJOR PUBLIC AND QUASI PUBLIC LAND HOLDINGS

Town	Name	Acres	Owner
Hingham	World's End	251	Trustees of the Reservations
	Whitney Woods	114	Trustees of the Reservations
	Wompatuck Park	1,800	State Dept. of Nat. Resources
	Home Meadows	80	Town (Commission for Conservation)
	Triphammer Pond Area	89	Town (Commission for Conservation)
	Brewer's Woods Area	40	Town (Commission for Conservation)
	Shirmer Tract	93	Town (School Department)
Hull	Nantasket Beach	105	Metropolitan District
	Urban Renewal Area	33	Town (Redevelopment Authority)
	Hall Estate	68	Town
Cohasset	Whitney & Thayer Woods	799	Trustees of the Reservations
	Wompatuck Park	560	State Department of Natural Resources
	Wheel Wright Park	70	Town
Scituate	Wompatuck Park	100	State Department of Natural Resources
	Cushing Park	70	State Department of Natural Resources
	Fourth Cliff Base	30	Federal Military Installation
	Former Boston Sand and Gravel Property	570	Town (for multi-purpose use)
	Ellis Estate	60	Town (Conservation Commission)
	Bailey Land	46	Town (Conservation Commission)
	Stanley Land	33	Town (Conservation Commission)
	Kent St. Marsh	45	Town (Conservation Commission)
	Pincin Hill (Proposed)	80	Town (Conservation Commission)
	Stern Meadow (Proposed)	65	Town (Conservation Commission)
	Reservoir (Proposed)	50	Town (Conservation Commission)

with high- and low-rise apartments. Also noteworthy is Hull's purchase of the Hall Estate, the last large tract of undeveloped land within the town. Current plans for this area include a light industrial zone, a neighborhood shopping center and cluster development.[10]

The state, federal and quasi-public institutional holdings are also shown in Table 1-16 and make up the final major ingredient in present land use. The Metropolitan District Commission (MDC) beach at Nantasket is, by far, the most intensely utilized land in the study area. By one estimate Hull's population swells to 100,000 on hot summer days due to bathers attracted to MDC facilities.[11] Wompatuck State Park is the largest perserve within the study area. Formerly a Naval ammunition depot, it is now used for hiking and camping. Cushing State Park performs a similar function and is located in southern Scituate. The Army is currently considering the termination of its base at Fourth Cliff in Humarock, Scituate and negotiations are underway to acquire this area which is known for its scenic vista of the North River estuary. The final major land holders are the Trustees of the Reservations, a non-profit conservation group nearly a century old. Their two reservations, Whitney-Thayer Woods and World's End, are available for passive recreation.

POPULATION PROJECTIONS

Forecasting future population is often of fundamental importance to a community, particularly when it entails planning for future capital facilities, such as schools and water supply, or when it involves estimating future tax revenues. The most analytical tool available to planners is the Cohort-Survival Model, which is a method of adjusting past census figures (which have been disaggregated by sex and age) forward to predict the number of survivors in each class of the population. The survivors of each class are determined by three variables: fertility rates, death rates, and net-migration rate. The first two variables are easily estimated by reference to long trends in local vital statistics. Properly estimating migration trends, however, is the crux of skillful forecasting, especially on the local level.

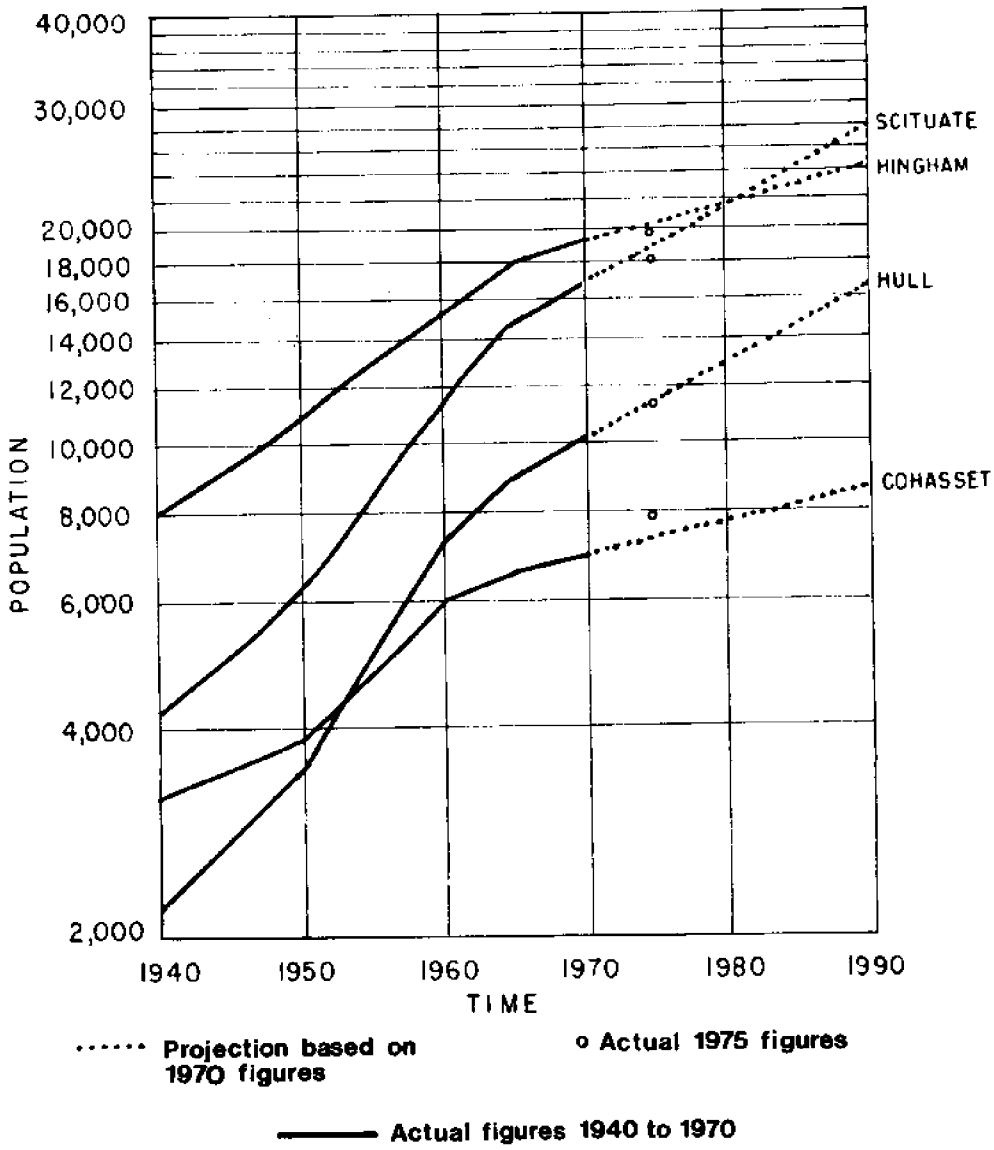


FIGURE 1-5: Population Forecasts

The Cohort-Survival technique was developed to estimate national population changes, and can be adapted to metropolitan or regional analyses, but as the forecast area gets smaller, migration trends become more volatile and more easily affected by local policy changes. For example, migration rates are affected by local employment opportunities, vacant land suitable for building, zoning restrictions, the construction industry, mortgage rates and the various subjective considerations that comprise the perceived "quality of life." When Cohort-Survival modeling has been fruitless, planners have often focused on one or more of the above variables to provide population ceiling figures. For example, the 1973 master plan for Scituate focused on the shortage of land suitable for building upon as the most important constraint on population. Such a constraint can be removed by changing zoning restrictions and making municipal acquisitions.

In preparing Chapters Two through Five of this report we have been content for the most part to deal with the population issue subjectively, avoiding the problem of quantifying the effect of policy changes on migration rates. To the extent that population forecasts were necessary, we have assumed a growth rate equal to the 1965-1970 rate. In Figures 1-5 population growth is illustrated logarithmically so that our projections appear as a straight line and imply a continuation of the 1965-1970 growth rates. Since the first draft of this report, the 1975 State Census has been tabulated and the actual 1975 populations have been plotted with our estimates. All in all, they have proven to be close approximations, and since rigorous prediction has not been necessary for the policy issues that have been raised, we have continued to use the figures forecast in Figure 1-5 throughout the report.

Chapter Two

COASTAL RECREATION

CHAPTER 2 Controlling Growth

By any standard the rapid growth of the South Shore has not been unfettered. Municipalities, through a wide variety of measures, have sought to control the rate and the nature of development. In this paper we will examine the most prominent "growth controls" of the study area from the economic and public policy viewpoints. Two main themes emerge. The first is a questioning of the legal limits to fiscal zoning. How far can a town go in seeking high tax-ratable development? What duties does it have to encourage low and moderate income housing? What effects do exclusionary practices have on the community? The second field of inquiry delves into the extent that land use controls can be used to protect what is perceived as the necessary environment. In regulating activities on private land, must a town allow a commercial owner a reasonable return on his investment? Must it allow an individual to build a home or continue to live in a critical environmental area? Can the landowner be required to leave his land in its natural state without some payment of compensation by the government?

EXCLUSIONARY PRACTICES AND HOUSING

Zoning and related land use controls, as traditionally employed in America, invest a tremendous amount of power in local hands. The vague purposes of zoning have been given expansive readings by the courts and local laws have been blessed with a presumption of validity. Ordinances will not be struck down unless they are arbitrary or unreasonable or bear no substantial relationship to the public health, safety, welfare or morals.

There are good reasons for this localized concentration of authority. One rationale is that local officials have a much better feel for the land and what sort of development is compatible with present uses and future goals. A second

reason for local responsibility is that municipalities can provide ongoing supervision of projects that would be nearly impossible through a centralized agency.

Nevertheless, there are disadvantages to local control. The system has tremendous potential for myopic decision-making, particularly when permisible land uses determine municipal revenues. The competition between localities to satisfy their needs tends to lead to land allocations that are economically inefficient, at best.

How can we define exclusionary practices? Broadly, we could include any attempt to alter the market demand for land.[1] But this definition would take in almost every type of land regulation. For the purposes of this paper we have defined exclusionary practices in terms of housing: a regulation is exclusionary if it limits the accessibility to housing within a community. Accessibility can be limited in two ways; either by density controls that limit the absolute number of dwellings or by fiscal controls that tend to make housing more expensive. As we will see, not all exclusionary practices are illegal. In almost every instance a countervailing public policy exists and the line between permissible and impermissible practices becomes blurred.

Some of the more prevalent exlusionary practices are: 1) large floor space requirements, 2) extensive building codes and site plan reviews, 3) timed development schemes, 4) building moratoriums, 5) large lot sizes, 6) multi-family and mobile home prohibitions and 7) bedroom restrictions. While large floor area requirements have been a problem in many states,[2] Massachusetts has effectively limited this practice by withdrawing from local communities the power to require floor areas of more than 768 square feet.[3] Likewise, building code provisions are now governed by a Uniform State Building Code.[4] Timed developments are utilized only in communities that have substantial areas of undeveloped land and profess a need to phase in development in order to coordinate it with municipal improvements. Although this concept poses interesting questions,[5] there is little use for it within the study area. Building moratoriums have also been turned down by the planning officials of

Hingham, Hull, Cohasset, and Scituate. We note in passing, however, that the Massachusetts judicial standard appears to be one of reasonableness. Two-year restraints, modeled after the Greenfield ordinance, have met with judicial approval.[6]

The last three tactics -- large lot zoning, mobile and multi-family homes prohibition, and bedroom restrictions are worth a closer examination because these practices have been implemented or are being considered by towns within the study area and because they reveal the traditional approaches of the judiciary to zoning.

A. Large Lot Zoning

The Supreme Judicial Court has spoken only twice on the question of how large a lot a community may require. In the 1942 case of Simon v. Needham[7] the court sustained a one acre lot requirement as "not unreasonable" as applied to the petitioner's land. The Needham court warned, however, that

> A zoning by-law cannot be adopted for the purpose of setting up a barrier against the influx of thrifty and respectable citizens who desire to live there and who are able and willing to erect homes upon lots on which fair and reasonable restrictions have been imposed nor for the purpose of protecting the large estatates already located in the district.[8]

The court then waited until 1964 to give any indication of what they thought would not be "fair and reasonable restrictions." In Aronson v. Sharon[9] the court held an ordinance that required 100,000 square feet (2.3 acres) lots invalid because it bore no relationship to the objects of zoning. Although the court reiterated its stand that many of the purposes of zoning could be furthered by reasonable minimum area for lots, it acknowledge that there was a point of "diminishing returns." The Sharon court shed little light on the criteria for valid lot sizes except to say that validity must be determined in "light of the present needs of the public and with a view to the probable requirements from normal future development."[10]

Based on these decisions almost every suburban community in the metro-

politan area promptly zoned most of its vacant land for one acre lots. Some bolder communities included two acre zones. The present zoning requirements of the study area and the approximate percent of residential land in each district are shown in Figures 2-1 and 2-2. The figures are further skewed if we take into account the fact that the great majority of vacant parcels are in the most restricted (one acre) districts. Comparing these figures to those in Table 1-12, it is obvious that the new homes in the study area must, in most cases, be built on lots substantially larger than those on which existing homes are built. A salient question is whether the one acre lot restriction approved in 1942 is responsive to the present and future needs of the public. As we have indicated in Chapter 1, with the present cost of homes on large lots running around $45,000 to $55,000, very few citizens of the Commonwealth who make less than $20,000 a year can afford to move into the study area.

On the other hand, was the court's invalidation of Sharon's even larger lots merely an example of bungled litigation? If town counsel had denied any greenbelt preservation motive and concentrated on specific amenities that flow from giant lots (i.e. agriculture or on-site septic systems) could the ordinance have been sustained?

A recent decision of an immediate appeals court in Massachusetts has proposed some more concrete criteria. In Wilson v. Sherborn[11] the court held that to justify a two acre district "the town must be able to bring forward some advantages which are tangible and not nebulous." It then approved the lot sizes on the ground that Sherborn was a rural town without public water supply or sewage system and that large lots were necessary to support wells and septic systems.[12]

If this decision is upheld upon appeal to the Supreme Judicial Court (SJC), then the validity of the study area's large lots would appear assured. In fact, the poor soil conditions in Cohasset and Hingham might permit even larger lot requirements to be sustained on the grounds that larger leaching fields or septic systems are necessary for the public health.

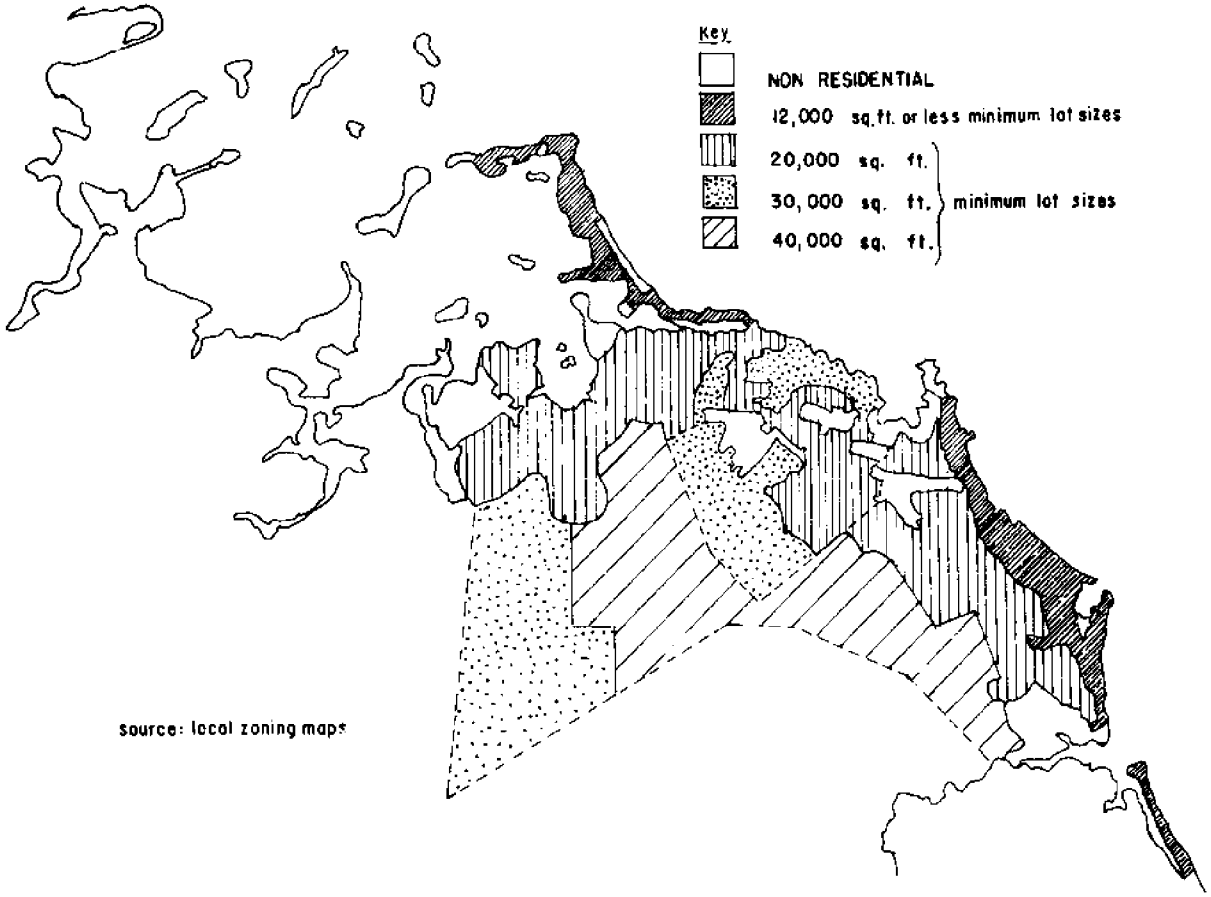
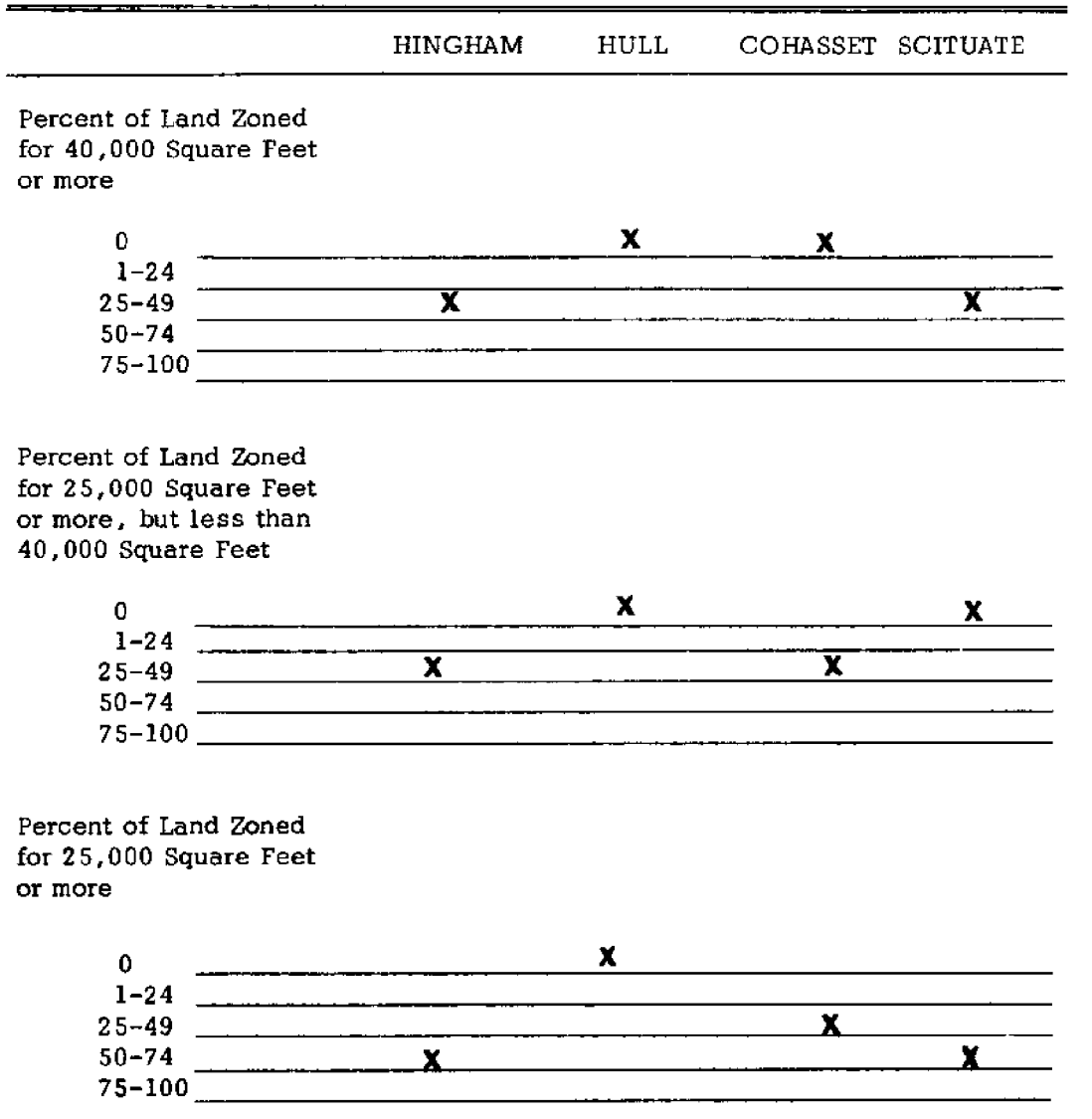


FIGURE 2-1: Residential Zoning of the Study Area



Source: Residential Zoning in the MAPC Region (MAPC 1972)

Figure 2-2: Residential Patterns

B. Mobile and Multi-Family Homes Prohibitions

For many who cannot afford to purchase a home, apartment living is a way of life. For others who can finance a home but do not want the headaches of maintaining real estate, condominiums are a logical alternative. In any event, multi-family housing is on the upswing in America. Nationwide the number of suburban apartments rose 96 percent in the decade from 1960 to 1970.[13] The construction of mobile (and not so mobile) prefabricated homes is also dramatically increasing. In 1969 mobile home shipments accounted for 28 percent of all new housing in America. In the Boston metropolitan area, however, prefabricated and mobile units constituted a mere 0.5 percent of new homes.[14] The suburban restriction of both multi-family and mobile homes has been greatly aided by the permissive rulings of the SJC.

As early as 1924 the Massachusetts court acknowledged that the power to zone encompassed the power to prohibit apartments from residential districts reserved for single-family dwellings.[15] Strong dicta from the Supreme Court's decision in the famous Euclid case echoed similar sentiments two years later.[16] A half-century has passed and yet apartments still suffer from the stigma of being considered "parasites" in residential districts. The recent decision of the Supreme Court in Village of Belle Terre and Borass[17] certainly reinforces this philosophy. The Belle Terre decision essentially held that the permissible goals of zoning included promoting family values, and therefore communities were justified in prohibiting groups of three or more unrelated individuals from living in single family districts. While banishing unrelated groups from family districts is not the same as banning multi-family housing throughout the jurisdiction, both proceed from the premise that "family" values can be fostered by a controlled residential pattern and the Belle Terre decision appear to approve both methods. The Massachusetts Supreme Judicial Court has not passed on either of these extremes. Most metropolitan Boston communities appear to play it safe by avoiding the Belle Terre type ordinance and by allowing some multi-family dwellings within the township (although they may relegate them to undesirable zones or make new construction a matter of discretionary permit).

The Massachusetts courts have also been very lenient in permitting communities to ban mobile homes. An early case[18] gave approval to local ordinances that prohibited the keeping of more than one trailer on any lot, or the use of any such unit as living quarters, except in trailer parks duly established under a state licensing scheme.[19] The ostensible reason for this ruling was that since health and safety problems arise more frequently in connection with mobile homes, such homes should be confined to established trailer parks where better protection can be provided.

In Manchester v. Phillips[20] the court went a step further and allowed local communities to ban trailer parks as well as individual mobile homes. The court concluded that a town could reasonably believe that mobile homes could injure the investments of conventional home owners, hurt the tax values or impede town development and that these interests were valid reasons for zoning. The Massachusetts court has also taken a strong line on the not-so-mobile prefabricated home. As one commentator suggests, the reasoning of the court appeared to be "a trailer is a trailer is a trailer" even if it is permanent, affixed to a foundation, and in conformity with local building codes.[21]

Opportunities for mobile and multi-family home construction in the study area are shown in Table 2-1. Multi-family dwellings are at least permissible in certain areas of each of the four towns,[22] but mobile homes are subject to strict regulation. The proposed Hull ordinance would ban trailers, the present Hull and Scituate ordinances make no provision for trailers (which arguably is a ban), and the Hingham and Cohasset ordinances allow only their temporary use.

Mobile home prohibitions are fairly common in the metropolitan area. From the study area, the nearest municipality to the north where mobile homes may be placed as a matter of right or permit is Cambridge. To the south, one would have to travel as far as Foxboro to find such provisions.[23]

At some point the decisions of the Massachusetts court should be reconsidered by planning officials. There is nothing inherently evil about mobile or multi-family homes. Both types of housing embody tremendous leaps forward

over the stereotypical designs of the past,[24] and appear to compose the strongest private elements of the low and moderate income home industry today.

TABLE 2-1

PROVISIONS FOR MOBILE HOMES AND MULTI-FAMILY HOUSING IN THE STUDY AREA

TOWN	MOBILE HOMES	MULTI-FAMILY HOUSING
Hingham	Temporary Use Allowed: Permanent occupancy prohibited	Permitted by Right in specific zones
Hull	No Provision	Permitted by Right in specific zones
Cohasset	Temporary Use Allowed: Permanent occupancy prohibited	Not Permitted
Scituate	No Provision	Permitted by Discretionary action in specific zones

Source: Residential Zoning in the MAPC Region (Metropolitan Area Planning Council 1972)

C. Bedroom Restrictions

The recent proposal to restrict the number of bedrooms in virtually all new multi-family housing in Hull[25] provides us with an opportunity to apply what we have previously described as the traditional judicial attitudes toward zoning. The candor of Hull Planning Board is probably an exception; and we would not be surprised to discover that bedroom restrictions are imposed by many local zoning boards of appeals when granting discretionary permits. Yet, our research has revealed very little litigation on bedroom restriction. In two New Jersey cases,[26] the restrictions were struck down by activist courts as part of exclusionary schemes that included large lot zoning, over zoning industrial uses, refusals to sewer, etc. The lack of litigation may reflect on obvious infirmity, but it is more likely that developers are reluctant to risk the wrath

of zoning boards by testing what they view as a minor constraint.

One purpose of the proposed Hull ordinance (which limits two bedroom units to 50 percent of a development and the other half to single bedroom units and studios) is clear: Hull is a town with a modest property tax base and it is seeking to channel growth into the higher income developments whose residents will not significantly add to municipal costs, particularly schools.[27] Can this be justified in terms of the purposes of zoning?

As a density control it would appear that bedroom restrictions would be struck down as either arbitrary,[28] bearing no substantial relationship[29] to density, or as not accomplishing, in any reasonable degree, its purpose.[30] It is obvious that density could be easily controlled by either limits on the absolute number of bedrooms in a development (leaving the developer the discretion to set a bedroom mix related to market conditions) or more simply by restricting the total number of units, as is commonly done.

If town officials argue that the purpose of zoning fostered by bedroom restrictions is property value preservation (or enchancement) and consequent municipal fiscal benefits, they may draw some support from the previous large lot and mobile home cases but the path is treacherous.[31] The court might conclude that the regulation is unduly burdensome to promote such an incidental improvement in general welfare (tax rates). There are also evidentiary problems: the property value of unrestricted apartment buildings may be even higher than developments with limited numbers of bedrooms because a larger rental market is available. In that case the issue boils down to the legality of excluding large families. Only the flimsiest support for this proposition can be found in the Supreme Court's approval of the "promotion of single family values" as a purpose of zoning in Village of Belle Terre v. Borass.[32] A subsequent decision in the New York state courts has shown a restrictive rather than an expansive reading of Belle Terre relegating it to its particular facts.[33] In all likelihood such a purpose would be struck down as contrary to the general welfare or in violation of the federally insured rights to procreate[34] and travel.[35]

AFFIRMATIVE DUTIES

In this next section we examine a question that is generating considerable judicial and legislative debate: should local communities, as trustees of the state zoning power, have an affirmative duty to provide a variety of housing that is designed to meet local and regional needs? We will first look at the Federal role, then the approach taken by New Jersey's activist court and finally the mechanics and effectiveness of the Massachusetts legislation (commonly known as the anti-snob zoning law).

A. The Federal Role

The birth of zoning is usually attributed to the Supreme Court's decision in the Euclid case.[36] Little is said or remembered about the district court's decision which struck down the village ordinance only to be overruled by the High Court. One excerpt from district court judge Westenhaver's opinion is particularly appropriate:

> The plain truth is that the true object of the ordinance is to place all the property...in a strait jacket. The purpose is... to regulate the mode of living... to classify the population and segregate them according to their income or their situation in life. The true reason why some persons live in mansions and others in a shack, why some live in a single family dwelling and others in a double family dwelling, why some live in a two family dwelling and others in apartments, why some live in a well-kept apartment and others in a tenament is primarily economic. It is a matter of income and wealth... it is sufficient to say it may not be done... under the guise of exercising the police power.[37]

On appeal the Supreme Court refused to accept such a detailed analysis of the merits. It perceived the judicial role in such a frontal attack as merely an inquiry into the rationality of the measure. If a single valid purpose of government could reasonably be said to be furthered by the ordinance, then it must be sustained. The Court then found sufficient justification for the segregation of residential, business and industrial buildings in terms of fire protection, safety, traffic control, mental health, residential amenities, etc.

It left, for another day, Judge Westenhaver's criticism.

Since the Euclid case, the Supreme Court has all but abandoned zoning. In the past 50 years only two cases have been decided on their merits.[38] The lower federal courts have also shown great reluctance to rule on the question of exclusionary practices[39] except in the context of racial discrimination.[40] Most recently the Supreme Court has handed down a stiff set of rules governing standing to challenge exclusionary ordinances.

In Warth v. Sedlin,[41] a bitterly divided Supreme Court ruled that a large group of petitioners each lacked standing to attack the land-use policies of Penfield, New York, an affluent suburb of Rochester. The petitioners (among whom were several Rochester area low and moderate income residents, several taxpayers from the city of Rochester, a metropolitan community action group, the Rochester Home Builders Association and the Monroe County Housing Council) sought revision of Penfield's zoning ordinance, which allocated 98 percent of the town's vacant land to single-family detached housing and made the building of low or moderate income housing impossible due to various density and infrastructural requirements. They further alleged that:

> Penfield's town, zoning and planning boards had acted in an arbitrary and discriminatory manner: they had delayed action on proposals for low and moderate cost housing for inordinate periods of time; denied such proposals for arbitrary and insubstantial reasons; refused to grant necessary variances and permits, or to allow tax abatements; failed to provide necessary supportive services...and had amended the ordinance to make approval of such projects virtually impossible.[42]

Faced with these allegations, the Court, nevertheless, felt incapable of acting. The complaints of the low income petitioners were dismissed because they failed to show that 'absent [Penfield's] restrictive zoning practices, there was a substantial probability that they would have been able to purchase or lease in Penfield and that if the Court affords the relief requested, the assorted inability of the petitioners will be removed."[43]

The claim of the Rochester taxpayers "that Penfield's zoning resulted in

greater taxes within the city to pay for housing and other essential services to the poor" was dismissed for lack of a sufficient "line of causation."[44] The argument of the community action group that 9 percent of its members who reside in Penfield were harmed by the exclusion of low and moderate income residents was rejected as an inappropriate "attempt to raise putative rights of third parties."[45] Finally the complaints of the builders associations were rejected because there was no viable development project existing or contemplated at the time. Thus the complaint "failed to show the existence of any injury to its members of sufficient immediacy and ripeness to warrant judicial intervention."[46]

The 5-4 decision was not without vigorous dissent. Justices Brennan, White and Marshall objected that "the very success of the alleged unconstitutional scheme is turned into a barrier to a lawsuit seeking its invalidation."[47]

As they saw it, the more successful a town was in excluding the poor and preventing low income housing construction, the more likely it would be to immunize itself from suit because the complaints could not meet the standing requirements. Justice Douglas, as the fourth dissenter, saw the allegations as an "un-American community model"[48] and also believed the court should have reached the merits of their arguments.

Whether or not the dissenter's allegations that the majority opinion reflects a basic hostility to the merits of the Penfield case are true, one thing is clear: the majority of the Court is extremely reluctant to plunge into the complex sociological and political problems of economic segregation. If affirmative duties are to be imposed upon communities it is very unlikely it will come from the Federal judiciary.

B. The New Jersey Approach

In contrast to the Federal judiciary is the New Jersey court system which has been particularly responsive to the housing needs of low and moderate income citizens. This section focuses on the 1975 decision of Southern Burlington Co NAACP v. Township of Mt. Laurel,[49] acclaimed by at least one

commentator as the most important case since Euclid.[50]

In the late sixties the Camden Coalition began its attack on the pattern of economic exclusion that it perceived was strangling that New Jersey city. After a suit and consent decree[51] which enlisted the aid of the city itself, the strengthened coalition sought a test site for its case. Mt. Laurel was chosen as a typical suburban community, with a housing density of approximately three units per acre, 30 percent of its vacant land zoned for non-existent industry, bedroom restrictions in its multi-family zone, failure to address its own substandard housing, and well-endowed with federal and state subsidies. Responding to the petitioner's multi-facted claims of exclusion, the trial court invalidated the Mt. Laurel zoning scheme in toto.

When appealed to the New Jersey High Court, Justice Hall sustained the lower court's opinion and, in an eloquent decision, found that the state constitution imposed upon all developing municipalities a duty to make realistically possible an appropriate variety and choice of housing to the extent of communities' fair share of the present and prospective regional needs. This duty was said to stem from the state's constitutional mandate to provide for the general welfare, and in this case "general" meant regional not local welfare.[52] Thus, when a regulation has substantial external impact, the welfare of the citizens beyond the town limits cannot be disregarded.

Justice Hall also used a number of other innovative techniques in dealing with what he recognized as an extremely polycentric problem. Unlike the federal court in Warth, he granted standing to non-residents even though the complaint of residents would have been sufficient to sustain his action. Since the decision was grounded in the "general welfare" it follows logically that non-residents must be allowed standing. Justice Hall recognized at least three types of non-residents to whom the courthouse doors were open: 1) those living in "central city substandard housing...who desired to secure decent housing", 2) former residents who were "forced to move elsewhere" and 3) organizations representing "housing and other needs of racial minorities."[53] A second innovation was a rule of evidence that comes into play whenever

exclusionary practices are shown. If petitioners make out a prima facie showing of municipal failing to provide adequate alternatives for low and moderate income housing, then the normal presumption of zoning validity is lifted and the burden shifts to the community to show its reasons why the general welfare is furthered by the ordinance. In Mt. Laurel the town was then forced to justify its action and failed. The town's argument that it may zone for fiscal prosperity fell short of the "reasonable and comprehensive plan for general welfare" standard. Likewise the alleged necessity of on-site septic systems was countered by the court's observation that the land was flat and capable of sewering by dedication requirements or special assessment.[54]

One potential weakness in the court's decision is in Justice Hall's choice of remedy. Although he sustained the trial court's determination that the ordinance was invalid, he did not declare it void. To do so would leave the town powerless against "voracious land speculators," he reasoned. Furthermore, he left it up to Mt. Laurel to correct its ordinance and bring its laws into line with the opinion and affirmative duties. Justice Pashman writing in a concurring opinion was not satisfied with this approach. After a half decade of litigation the plantiff's victory, in Pashman's eyes, was pyrrhic -- all they had won was an opportunity to renew litigation if Mt. Laurel failed to act. Pashman would have sought a bolder fashioning of remedies such as a judicial revision of the ordinance.

The Mt. Laurel decision will certainly be a landmark but many unanswered questions remain: what amount of evidence will be sufficient to make out a prima facie case of exclusion? What formula should be used for determining a community's "fair share" of present and prospective regional needs?[55] Beyond this, what is a region?[56] Moreover, since the Mt. Laurel decision applies to all similarly situated developing communities, how will the court deal with municipal foot-dragging? Finally, is the Judiciary an appropriate institution to deal with such complex, long-range problems?

C. The Massachusetts Approach

Is the legislature a more appropriate vehicle for dealing with economic segregation? An examination of the much heralded[57] Massachusetts Zoning Appeal Law[58] reveals some answers.

This statutory appeal process, passed as Chapter 774 of the Acts of 1969, attempts to provide a means by which a qualified developer can construct low and moderate income housing in a community that has restricted such development. The statute also attempts to be sensitive to the needs and concerns of the community and reflects a desire for state review of certain land use decisions while maintaining the traditional local role in the decision-making process. In the 1973 case of Board of Appeals of Hanover v. Housing Appeals Committee in the Dept. of Community Affairs,[59] the Massachusetts Supreme Judicial Court held that

> The legislature's adoption in the nature of the Low and Moderate Income Housing Act of an administrative mechanism designed to supersede, when necessary, local restrictive requirements and regulations, including zoning bylaws and ordinances in order to promote construction of low and moderate income housing in cities and towns is a constitutionally valid exercise of the legislature's zoning power.[60]

and thus silenced any doubts[61] as to the legislature's power to deal with exclusionary practices.

In the specific instance being reviewed, the Supreme Judicial Court upheld the right to grant a comprehensive permit for construction of low and moderate income housing to a qualified corporation by the local zoning board of appeals, despite the fact that such construction was not permitted under local zoning ordinance. Even more important was the holding that if the local board of appeals denied the comprehensive permit, the housing appeals committee of the Department of Community Affairs had the authority to reverse the decision of the local board and grant the permit.

Moreover, the Court gave a broad sanction to de novo review[62] by the

Housing Appeals Committee[63] and accepted the committee's narrow delineation of the permissible grounds on which a local zoning board could refuse to issue the comprehensive permit. The Committee may review both comprehensive permit denials and permits granted subject to uneconomic conditions to determine whether the local action was "reasonable and consistent with local needs."[64] There are two ways for a community to satisfy this standard. Section 20 of the Act exempts from its operation those communities that have low or moderate income housing which exceeds certain quotas pertaining to land area and units of housing devoted to such housing.[65] Therefore, every community has a ceiling on the number of units it is required to allow. These criteria are currently met by the City of Boston and only a few other communities in the Commonwealth. (None of the communities within the study area meet the statutory minimum.)

If a community fails to satisfy this exemption, it must then determine local needs by a second test. The statute directs the committee and the local board to balance the regional need for low and moderate income housing and the local population of low income persons against certain planning objectives. These objectives include the protection of health and safety, the promotion of better site and building design in relation to the surroundings, and the preservation of open space. Even these planning objectives have been essentially limited by the Court to the substantial issues of public safety and site and building design. Most denials of comprehensive permits by local boards have been overturned by the Housing Appeals Committee.

The recent case of the Planning Office for Urban Affairs v. Scituate Board of Appeals[66] is an excellent example of the application of Chapter 774 and the conflicting interests represented by the balancing process. In July 1973, the Scituate Board of Appeals denied an application under Chapter 774 by the Planning Office for Urban Affairs of the Archdiocese of Boston for a comprehensive permit to construct forty units of low income, town-house type cooperative housing. The building site was a five acre plot at the southeasterly intersection of Stockbridge Road and Meetinghouse Lane in Scituate. The project was to

receive subsidy financing from the Massachusetts Housing Finance Agency. When the case was appealed to the Department of Community Affair's Housing Appeals Committee, the central issue was whether the denial of the application by the Board was consistent with local needs as that phrase is defined in Section 20 of Chapter 774. It was conceded that Scituate failed to satisfy any of the mathematical criteria necessary for an exemption.

The case, therefore, was reduced to a balancing test of local considerations such as public health (need for sewers), safety (traffic), aesthetic design and open space to be weighed against regional need for this housing, and the number of low income persons in Scituate.

The planning office presented both statistical and testimonial evidence on the number of poor people in Scituate and the regional need for low income housing. The main conflict involved various definitions of region since the term was not sharply defined in the statute. Statistical evidence kept by the Department of Community Affairs, the South Shore Community Action Council, and the Metropolitan Area Planning Council was presented. The recent Scituate Town Plan and the Downe Study of multi-family housing in Scituate also contained evidence on regional needs. After reviewing this evidence, the Housing Appeals Committee concluded that "there is a regional need for low income housing together with a substantial number of low income persons in Scituate." The Planning Office for Urban Affairs having satisfied their side of the balancing test, it was necessary for the Sctituate Board of Appeals to show that local health, safety, and planning considerations out-weighed the extent of the housing need.

The proposed project was attacked for its detrimental impact on public health because of an inadequate assurance of proper sewage disposal and a lack of adequate drainage facilities. The Committee, after considering much evidence from both sides, concluded that the proposed sewage disposal and drainage systems presented no health hazards. Similar charges of danger from increased traffic created by the proposed development were also rejected by the committee which concluded that "no health or safety hazards exist, or will

be created by the proposed construction, of gravity sufficient to outweigh the regional housing need."

The strongest attack by the board on the proposal came in the area of site and building design. The committee was favorably impressed by the building design and saw the town-house type of building as the best compromise between single family detached houses and garden apartments. The test in the area of design must consider the adequacy of individual units to accommodate families and the compatibility of the design with the surrounding area. Much evidence was introduced by the Planning Office to support the site design and location. Expert witnesses and the recommendations of the Downe Report were employed.

The Board's argument was that the neighborhood was an historic area, and that the proposed development would impair the historical significance of the area. It was argued that the visual quality of the area would be adversely affected, and that the proposal would aggravate security problems in protecting historic sites. These aesthetic arguments were rebutted by the Planning Office and reported by the committee. The committee conceded that there would be increased security problems, and it proposed a remedy of increased countermeasures by the town. The committee failed to find historical concerns which would outweigh the perceived need for the proposed housing.

Obviously Chapter 774 has had substantial impact on Scituate, Hanover, and several other communities. The facts of these cases, however, point out several weaknesses in the Act. The purpose of Chapter 774 was primarily to deal with economic problems of low and moderate income housing. These problems still exist. The primary concern of site acquisition costs is not really solved by the Act and continues to be a major obstacle for the developer. The time delay involved in cases such as the Scituate case, which has taken over two years, will make it financially impossible for many developers to build. Very few developers can afford to tie up capital and investment for such a long time. In fact, only 100 units of housing have been built under Chapter 774 in its six years of operation.[67] As one commentator puts it, "few devel-

opers are willing to jump through all the administrative and judicial hoops"[68] for the chance to build low income housing. The number of potential developers is also limited by the requirement that the developer be a non-profit or limited dividend corporation. At the present time it appears that the anti-snob zoning act will not have the overall effect hoped for by its sponsors. At best it reflects a moral commitment on the part of the Commonwealth and a source of encouragement for local communities to provide more low and moderate income housing.

PROPOSALS FOR CHANGE

Given the strong evidence that the Massachusetts zoning appeals law has not solved the problem of exclusionary practices, the appropriate question is "Why not?" To answer that question it is necessary to know what the causes of exclusion are. While class and racial attitudes may have some bearing, critics are almost unanimous in singling out the property tax system, at least in Massachusetts, as the predominant factor.

Recent studies[69] have revealed that the Commonwealth has the highest property tax rates in the nation. The recent decisions of the Supreme Judicial Court requiring 100 percent valuation[70] will probably exacerbate the situation as the tax burden shifts from industry to homes.[71] Present tax rates and assessments for the study area are shown in Table 2-2. Almost all of the property tax goes to local governments which provide community services. Of the services provided, school costs are, by far, the largest municipal expenditure. To ease property taxes, communities engage in vicious competition for high tax ratable enterprises such as office parks, light industries and regional shopping centers. When this is not possible, they seek to attract high income residents who will live in expensive homes. Any way you slice it, local planning in Massachusetts revolves around the goal of creating a substantial tax base.

As a result socially divisive and uneconomic exclusionary practices develop. The heavy reliance on property taxes for municipal services encour-

TABLE 2-2

TAX RATES AND ASSESSMENTS

Town	1976 Tax Rate per $1,000 Assessed Value	Assessment Ratio	1976 Full Value Tax Rate Per $1,000 Value
Hingham	66.00	88%	58.08
Hull	111.00	88	91.68
Cohasset	42.75	97	41.47
Scituate	74.40	90	66.96

Source: Mass. Dept. of Corporations & Taxation, Bureau of Local Taxation

ages the affluent to migrate to suburbs where they perceive a better return on their tax dollar. For those who cannot afford to move, there is a frustration of upward mobility. As the employers who provide better paying jobs also move out to the suburbs,[72] the poor are left behind. The potential for economic segregation is already being felt in many central cities nationwide as the fiscal and social costs of dealing with conglomerated poverty soar.[73]

The ills effects of economic exclusion , however, are not confined to the inner cities. The distortion of the private market system has the side effect of reducing availability and raising prices of housing in general. More importantly, it has long term effects on the fabric of the community itself.

As the children grow up, or young married couples settle down, they find it impossible to remain in their hometown because there is no available housing they can afford, or that will fit their needs. Parents in the suburbs, whose children have grown up and moved away, have similar problems. They find themselves with large homes they no longer need, and taxes which constantly increase. The option of remaining in their town, but in a less expensive, more suitable dwelling is not available because most of the housing continues to be large, single-family, detached units.[74]

It appears that any effective solution to exclusionary practices must

sever (or at least loosen) the tie between the local property tax and municipal services. To do this, of course, means generating new statewide revenue sources and redistributing the funds to cities and town according to their needs. Unfortunately there are few untapped tax sources in Massachusetts. In addition to having the highest property tax rate, the Commonwealth ranks sixth highest in income taxation.[75] Nevertheless, two methods of easing the local property taxation problem have recently been proposed by the Research Department of the Federal Reserve Bank of Boston.[76]

Under the simpler of the two proposals, new revenues would be generated from increases in the sales tax (which is comparatively low and depleted by exemptions) and the gasoline tax. The new funds would be returned to local governments to help ease the property tax burden.[77] Proponents of this proposal predict these measures could lower local property taxes from 5 to 16 percent. On the other hand, opponents of this local aid suggest taxes will remain at nearly the same level and local government will find new ways to spend the money.

A more comprehensive proposal of the Research Department would involve a complete reform of the school financing system. Under their second proposal, in addition to raising the sales and gasoline taxes, higher income and state-wide property taxes would be pooled to pay about 90 percent of the cost of public education and reimburse communities for 50 percent of state mandated local property tax abatements. The effect of this proposal on the study area is difficult to estimate,[78] but some general observations can be made. There will be an obvious redistributive effect: the taxes from wealthy communities will be going to support better schools in poorer communities.[79] The proposal would also be a great help to communities that have previously been burdened by tax-exempt enterprises such as educational institutions and state parks. Finally the proposal would remove much of the impetus for fiscal zoning by severing the tie between local property wealth and school spending.

Even discounting property tax reform, there are strong reasons why a community should reconsider its zoning policies. One common misconception

is that apartments are more costly in terms of municipal services than single-family detached homes. This misconception can be illustrated by contrasting the revenues and social costs of the two types of housing. A comparison of the primary cost, educational services, for garden apartments (8 units per acre) and large lot (1 acre) homes is presented in Table 1-3. The method of computing revenues from the large lot scheme was simply to assume an average market value of $55,000 and an estimated tax rate of $60 per thousand of assessed 100 percent valuation. Multiplying these two figures together and again by 10 residences yields 30 thousand tax dollars. In determining the cost of educational services, it is typical to assume that the average demand on the local system will be two children from each single-family, large lot home. Using the target figure of the previously discussed school reform proposal of $1,000 per pupil, we arrived at a municipal cost of $20,000 leaving a balance of $10,000 to pay for all other municipal services.

The method for computing the tax revenues generated by apartments was somewhat different. Assuming apartments which rent for $250 per month, or $3,000 per year, the annual tax revenue per unit can be computed by multiplying a factor of 20 percent, and multiplying by the number of apartments for the hypothetical 10 acre site, which is 80. This results in an annual tax revenue of $48,000. We then adjusted this figure downward 10 percent to reflect a 10 percent vacancy rate, producing a tax yield of $43,200. In determining the municipal education costs for the garden apartments the average number of children for this type of housing is not two children per unit but 0.2 per unit,[80] and the annual cost to the town (0.2) x (80) x (1,000) = $16,000. As Table 2-4 indicates, higher density developments can produce a much larger residual amount with which to meet the costs of other municipal services. Other studies have also shown that by clustering development into apartments, rowhouses or townhouses, a community can achieve lower sewer connection, road construction and road maintenance costs.[81] Another consideration a town might want to look at when deciding what type of housing it needs and where to put it, is access to transportation facilities. Parcels of undeveloped land

TABLE 2-3

COST COMPARISONS FOR SINGLE-FAMILY DETACHED HOMES VERSUS MULTI-FAMILY HOUSING

TYPE	Average No. of Children per Unit	No. of Units in 10 acre Development	Average Educational Cost per Child	Total Educational Cost
Garden Apts -- 8 Units Per Acre	0.2	80	$1,000	$16,000
Large Lot Home -- 1 Unit Per Acre	2.0	10	1,000	20,000

TABLE 2-4

COMPARISON OF TAX REVENUES GENERATED COSTS AND REVENUES OF SINGLE- AND MULTI-FAMILY HOUSING

TYPE	Average Monthly Rental	Average Yearly Rental	Estimated Tax Per Unit = 20% of Yearly Rent	Average Market Value of Homes	Est. Tax Rate Per $1,000 (100%) Value	Tax Per Unit	Units Per 10 Acres	Total Tax Revenue
Garden Apts -- 8 Units Per Acre	$250	$3,000	$600	--	--	--	80	$48,000
Large Lot Home -- 1 Unit Per Acre	--	--	--	$50,000	$60	$3,000	10	30,000

which lie on existing bus routes, for example, should be seriously considered as possible sites for more intensive development. This statement is based on the reasoning that it is more efficient and economical in the long run for people to travel by mass transit rather than by personal automobiles. Also the decision to develop a parcel more intensively can have a significant effect on the decision to initiate new and more convenient mass transportation facilities. That is, if there are more people along a possible mass-transportation route, the economic feasibility of initiating service increases tremendously because potential revenue would be higher. Moreover, as the next sections more fully explain, designating sites for more intensive development not only eases the the problems of exclusionary zoning, but also, in the long run, helps preserve open space.

Finally, we note Justice Hall's observation in Mt. Laurel: "Courts do not build housing nor do municipalities." Will reforming the property tax system and relaxing costly restrictions provide enough stimulus to the private housing market to build inexpensive homes? Landowners, whose land is rezoned to allow higher densities will almost invariably attempt to realize greater sale prices. The question will become increasingly important if other state courts follow New Jersey's lead and impose constitutional affirmative duties. As one commentator suggests:

> Courts may be able to require integration of schools by redistricting or busing. But they approach the limits of their powers when they attempt to force the construction of facilities, the expenditure of public funds and the floating of public bond issues. At that point, the burden shifts to the legislature, and ultimately to the voters.[82]

Does Massachusetts need to impose affirmative duties on localities to establish public housing authorities and build housing for the state's poorer citizens? Should a public corporation similar to New York's Urban Development Corporation be established to aggressively pursue a building program across the state? The answers to these questions are unfortunately beyond

the scope of this paper. One thing, however, is clear: the wait-and-see attitude that has prevailed in Massachusetts since the Zoning Appeal Law cannot last forever. It is nearly (or perhaps past) the time to assess our progress in providing decent housing for all our citizens and to decide what further steps are in order.

THE CONCERN FOR CONSERVATION

In this section and the next we will examine another type of growth control which for want of a better term might be called "open space" laws. Although the question of what land should be built upon and what should not is nearly as old as civilization,[83] the concern for protecting what is perceived as the necessary environment has taken on new meaning in recent years.

The past decade has witnessed a progression from simple flood prevention measures to more ambitious legislation and proposals to protect wetlands, scenic sites, aquifer recharge areas and agricultural lands. Most of these measures have met with judicial hostility. In this section some of the more common Massachusetts "open space" laws are examined.

A. The Wetlands Act[84]

Under this act no person may interfere with the natural state of a wide variety of lands bordering on coastal or inland waters[85] without filing an intent to alter notice with state and local officials. After a public hearing the local body (local conservation commission, or, if none, board of selectmen or mayor) may impose such conditions as are necessary to protect the enumerated environmental interests.[86] A large class of parties have standing an appeal to the Commissioner of Natural Resources for a superseding order.[87] Persons aggrieved by the state may petition the Superior Court.

The amendments that consolidated the wetlands acts into the present provision have been lauded as offering "a real opportunity for cooperation of local and state governments in the preservation of open spaces and encouragement of rational land development."[88] Prior to the 1972 amendment local con-

servation commissions had only an advisory role whereas the new law gives them primary responsibility for conducting hearings and evaluating proposals. The benefits of developing a local conservation expertise are obvious (knowledge or community needs, expertise, and capacity for on-going supervision), and it would appear that this strategy has worked well in the towns of Hingham, Hull, Cohasset and Scituate. A major unanswered question is how stringent an order of conditions may be and this is discussed in the final section.

B. The Scenic Rivers Act[89]

Under this act the Commissioner of Natural Resources may regulate or prohibit alteration along all rivers or streams of the Commonwealth. The Commissioner's authority extends to the contiguous land up to 100 yards on either side of the natural stream bed. The purposes of the regulation are not limited to the traditional police power objectives (such as safety, protection of wildlife and fisheries) but also allow the Commissioner to prohibit develpment to protect the "irreplaceable wild, scenic and recreational resources." Landowners who have been restricted may petition superior court but to date no case has been brought to test the validity of the regulation.

C. Municipal Floodplain Zoning

Under the Massachusetts Zoning Enabling Act, a community "may provide that lands deemed subject to seasonal or periodic flooding shall not be used for residence or other purposes in such a manner as to endanger the health and safety of the occupants thereof."[90]

A major impetus to this kind of zoning has been the Federal Flood Insurance Program.[91] Using the carrot and stick approach, funds have been available to plan floodplain management programs and at the same time heavy pressure has been used to convince communities of flood hazards. The act makes participation in the Flood Insurance Program mandatory as a condition for any federally related financial assistance (i.e., VA, FHA, and SBA loans) to communities or individuals wishing to acquire or refinance property or build within towns designated as flood hazard areas. All four towns in the study area are

designated as flood hazard areas and can expect their already complex regulations to undergo substantial revisions to meet federal standards. For example, local floodplains are usually delineated by simple elevations from sea or river level. Under the federal requirements the zone must correspond to floor stage contours which vary upstream and downstream. Similarly, the federal standards demand strict policies aimed at abolishing nonconforming uses (such as all structures in Humarock).

Hingham, Cohasset and Scituate each have municipal floodplain and watershed protection zones which require special permits in order to build any new structure, patterned after the H.U.D. floodplain building regulations. Hull is awaiting final mapping of hazardous areas before enacting such a measure. In the model H.U.D. legislation the criteria for the granting of a special permit is the finding that the occupants will incur or cause no health or safety hazard during times of flood. Various nonconforming uses provisions also come into play whereby owners of homes and businesses built prior to the passage of the floodplain zoning regulation are prohibited from enlarging the structures, or reestablishing abandoned uses.

D. The Home Rule Amendment

In 1964 the town meeting of Cohasset passed an ordinance similar to the present wetland act (the state coastal protection proposal was at the time bogged down in committee) and sent their measure to the attorney general for his certification. The attorney general declared the Cohasset ordinance void as beyond the powers granted in the Massachusetts Zoning Enabling Act. This was the state of affairs prior to the Home Rule Amendment: a municipality could only exercise those powers expressly conferred, or essential to the accomplishment of the declared purposes of the municipality.[92]

Partially in response to this narrow judicial construction of Cohasset's power, the voters of the Commonwealth passed amendment 89, commonly known as the Home Rule Amendment, in 1966. It provides that:

> It is the intention of the article to reaffirm the customary

> and traditional liberties of the people with respect to the conduct of their local government...[93]
>
> Any city or town may by the adoption, amendment or repeal of local ordinances or by-laws, excercise any power or function which the general court has power to confer upon it, which is not inconsistent with the constitution or laws enacted by the general court in conformity with the power reserved to the general court by section eight and which is not denied, either expressly or by clear implication, to the city or town by its charter...[94]

Thus, with exception of six reserved state powers,[95] the voters of Massachusetts chose a self-executing form of local government, where cities and towns were given wide latitude to try out innovative programs.

The full effect of the home rule amendment on the ability of local governments to regulate land use is still unknown because of the lack of litigation, but two cases have shed some light on this subject. In Bloom v. Worcester[96] the Supreme Judicial Court adopted a test for judging local enactments: in the absence of a specific statute the issue was whether the local ordinance or by-law frustrates the fulfillment of the legislative purpose of any arguably relevant general law.[97] In the Hanover case,[98] sustaining the Massachusetts Zoning Appeals law, the Court recognized that zoning was an independent municipal power that could exist irrespective of the state enabling act. The Court, however, intimated no opinion as to how much local prerogative was preempted by the state "enabling" law. Presumably the same test as in Bloom applies: local land use regulations that do not try to circumvent the procedural safeguards or subvert the substantive goals of the state zoning and planning laws should be sustained.

Pursuant to the Home Rule Amendment Cohasset has adopted a special by-law entitled "Protection of Natural Features," which requires a special permit before anyone may obstruct, dredge, excavate, or fill any of the town's marshes, wetlands, streams, tidal rivers, brooks, or ponds. Similarly, Scituate has adopted a Saltmarsh and Tideland Conservation District which allows only

for noncommercial docks, catwalks, wharves, floats, public parking, recreation or water supply uses as a right. Uses requiring a permit from the Board of Appeals include all permitted uses of the zone that existed before this district was adopted, or for filling, draining, dredging or excavation. The permit will not be granted if the proposed use would adversely affect the natural character of the site.

THE LIMITS OF REGULATION

In this section legal/constitutional limitations are examined first in the context of the power to regulate (or prohibit) development and then as applied to the elimination of nonconforming uses. Finally, a few of the recent innovations aimed at the preservation of open space in other ways are examined.

A. The Regulation/Taking Line

The requirement of "just compensation" when government expropriates private property was a uniquely American contribution to 18th century jurisprudence. The principal, which first appeared in the Vermont and Massachusetts constitution of 1777 and 1780 and is firmly embedded in the Fifth Amendment of the Constitution,[99] was probably a reaction to the arbitrary military seizures during the Revolutionary War and as an added safeguard to landed aristocracy who were just as fearful of absolute democracy as they were of absolute monarchy.[100] Early decisions under the state and federal taking clauses revealed no clear concensus as to the scope of protection. Undeveloped land was often considered worthless and compensation usually granted only for developed parcels. Furthermore, payments were considered necessary only when title (or a recognized interest such as a highway easement) passed to the government.[101]

On the federal level two famous cases stand in juxtaposition. The most powerful case for the regulation of property being Mugler v. Kansas,[102] where a state law prohibiting the manufacture and sale of intoxicating liquors was upheld by the Supreme Court although it eliminated the worth of Mugler's

Brewery. Justice Harlan strongly affirmed the validity of the police power: "A prohibition simply upon the use of property for purposes that are declared, by valid legislation, to be injurious to the health, morals or safety of the community, cannot in any sense be deemed a taking or an appropriation of property. . ."[103] Shortly thereafter the notion arose that regulation should not be allowed if it deals too harshly with an individual's ability to profit from his property. The appointment of Justice Holmes and others who shared this view with the Court insured that a second interpretation would be articulated. In Pennsylvania Coal Co. v. Mahon[104] the Court invalidated a Pennsylvania law prohibiting mine operations beneath residential areas because the statute effectively destroyed the coal companies' mineral rights. In the words of Justice Holmes "the general rule at least is, that while property may be regulated to a certain extent, if regulation goes too far it will be recognized as taking. . . (A)s we already have said, this is a matter of degree."[105]

It should be noted that while the Mugler and Pennsylvania Coal Co. cases differ on the issue of intensity of regulation, both assume an externalities analysis. That is to say, government may regulate land in the interest of preventing what it perceives as harmful externalities of the landowner's use. Under Mugler, if a harmful externality is perceived, the test is satisfied and the government may prevent the exercise of property rights which give rise to this harmful externality. Under Pennsylvania Coal a harmful externality alone is not enough. The test is twofold: even if the Court perceives a harmful externality to the property owner's activities, the Court must further inquire as to whether the governmental prohibition "goes too far" in limiting the property owner's rights. A more radical theory of government suggests that the regulatory power may be exercised not only to stop harmful occurances, but also to require actions that enhance the social, economic, or physical environment.[106]

This "General Welfare" analysis is apparent in the Scenic Rivers Act which, as previously mentioned, gives DNR the power to prohibit alteration of river banks in the interest of protecting the wild, scenic, and recreational

resources. A third intermediate theory of government is the "entrepreneur/arbitrator" analysis which assumes that government actions that compete with the private market require compensation, but when government uses its rule making power to settle disputes between landowners no compensation is necessary.[107]

Until recently the dominant judicial mode of analysis of taking issues has been the Pennsylvania Coal Co. test. First, the courts would look for externalities. Was the harm in the property owner's conduct or was this a case of the government appropriating a benefit? (If the regulation required physical invasion of the landowner's property or other action that offended the traditional notions of exclusive use and possession, then the courts would almost invariably define this as a "benefit."

Second, if it was satisfied that the government was not appropriating a benefit, the court would examine the "diminution of value" to insure that the regulation did not go too far as the Pennsylvania Coal Co. case mandated. Many modern commentators object to both parts of this traditional test for "takings." The harm/benefit classification of the first prong is, in the words of one commentator, "not a test at all, but rather a statement of psychological reaction."[108] Even more strenuous is the objection to the dimution of value test because it has the inherent bias of considering only the harm imposed on the individual and not the necessity of the regulation.[109] For example, to the extent that the test focuses solely on the landowner, the formula denies recognition and protection of such public rights as clean air and water and freedom from noise, flooding, and erosion.

A greater recognition of these environmental implications is slowly persuading state and federal judiciaries.[110] In place of the objectivity of a ratio of present to past value, some courts at least seemed willing to weigh the value of many different elements. The recent decisions of the Massachusetts courts have been particularly confusing, as the following cases illustrate.

Until very recently, the leading Massachusetts case of the taking issue in relation to land use was Commissioner of Natural Resources v. Volpe

decided in 1965.[111] In the Volpe case the predecessor of the present wetlands act was challenged as a taking when DNR imposed a no fill condition on the Volpe Construction Company's plans to develop 30 acres of salt marsh. The SJC in an opinion by Chief Justice Wilkins touched on the taking issue, in commenting:

> where most of the value of a person's property has to be sacrificed so that the community welfare may be served, and where the owner does not directly benefit from the evil avoided... the occasion is appropriate for the exercise of eminent domain.[112]

but ultimately remanded the case of further findings on the following matters: 1) the natural uses for which Volpe could put his land under the statute; 2) the assessed value of the locus; 3) the cost of the land to Volpe; 4) the diminution in value; and 5) the estimated cost of Volpe's proposed improvements.

Unfortunately the Volpe litigation was settled without a conclusion on the taking problem. The court's remand instructions reveal it was extremely interested in the articulation of a taking theory that could embrace the new generation of environmental laws. Whether environmentalists would have been pleased with the court's decision is purely speculative but the passage quoted above suggests that the Supreme Judicial Court at that time continued to embrace the diminution of value test. This entrenchment was further revealed by the court's indication that it desired that briefs address the issue of whether or not a regulation must yield an owner a fair return on his investment. The Court's dicta appears to lean heavily towards a need for compensation, perceiving the preservation of remaining wetlands in their natural unspoiled condition as a benefit.

The problem of using the harm/benefit test is well illustrated here. Preserving wetlands can be characterized, just as easily, as a harm preventing measure. Compare the trial courts findings in Volpe:

> The court finds the nutrients derived from Broad March, and, in particular, the portion thereof to be filled by respondent, play an important and integral part in sustaining the life of the shell fish and fin fish in the

> area adjacent thereto. The marsh itself is part of an ecosystem, or productive life unit, producing nutrients... Without these nutrients untoward damage will result to the marine fisheries... The police power undoubtably extends to prevent a potential waste of resources in those cases where such resources may be devoted to the public health or welfare.[113]

Notwithstanding the seeming commitment to the harm/benefit and diminution of value tests, an entirely different tack appeared in Turnpike Realty Co. Inc. v. Town of Dedham,[114] where a municipal floodplain regulation was challenged. In Turnpike Realty, the SJC, under new Chief Justice Tauro appeared to have replaced the dimunition in value test with an ad hoc balancing test, although the Chief Justice hastened to add in a concurring opinion that the Volpe question is far from settled. Litigation began after a local board of zoning appeals denied a special permit to construct an apartment building in a floodplain. In a departure from the traditional test the court explained:

> Although there was a substantial diminution in value of the locus, the mere decrease in the value of a particular piece of land is not conclusive evidence of an unconstitutional deprivation of property.
>
> There is no set formula to determine where regulation ends and taking begins. Although a comparison of values before and after is relevant... it is by no means conclusive...
>
> The police power regulates use of property because uncontrolled use would be harmful to the public interest. Eminent domain, on the other hand, takes private property because it is useful to the public.
>
> The petitioner, moreover, has not been deprived of all beneficial uses of its property. The by-law specifically permits "Any woodland, grassland, wetland, agricultural, horticultural or recreational use of land or water not requiring filling." Although it is clear that the petitioner is substantially restricted in its use of the land, such restrictions must be balanced against the potential harm to the community from overdevelopment of a flood plain area.[115]

Thus in Turnpike Realty's ad hoc balancing two factors are important: 1) the potential harm to the community, and 2) the substantiality of the restrictions on the owner.[116] The concurring opinion, however, warned that this decision should not be read as a blanket approval of conservation restrictions.

The hope for judicial approval of strict environmental measures based on ad hoc balancing was unfortunately shortlived. In the 1976 case of MacGibbon v. Duxbury[117] the Massachusetts Supreme Judicial Court appears to have reverted to the Volpe diminution in value test. The issue in the MacGibbon cases was whether the Town of Duxbury could prevent the filling of tidal marshes by enacting a by-law to "protect and preserve from despoliation the natural features and resources of the town." The Court rejected the argument that the land was unsuitable for residential construction or installation of septic systems because MacGibbons was not seeking a building permit but rather only the right to fill his land. The Court also rejected environmental arguments such as the necessity of protecting the ocean food chain by classifying the regulation (in the tradition of the Pennsylvania Coal Co. case) as one which seeks a public benefit and not one which prevents an external harm. Moreover the Court hinted that even if the town by-law could be seen as a harm preventing measure, the fact that the marsh owner was left with only agriculture and recreation as possible uses was too much of a diminution in value.[118]

The Turnpike Realty case was dismissed by the MacGibbon's Court as a case involving the protection of individuals from flood dangers. No mention was made of the ad hoc balancing approach of that case.

Justice Reardon, joined by Justice Wilkins, dissented believing "the problem which this case presents is a valid exercise for the public police power to restrain an injurious private use". He alluded to a recent decision of Massachusetts' sister state, New Hampshire, which on almost identical facts had perceived wetlands regulations to be valid exercises of the police power. Finally he warned that the MacGibbons case is "freighted with important implications far beyond the case itself, and what flows from it will return to

haunt us."

Given the confused state of the law in the aftermath of the Volpe, Turnpike Realty and MacGibbon cases, one question that remains is how many of the state and local "open space" laws are valid? The previously mentioned Massachusetts Scenic Rivers Act would appear to be doomed by its own draftsmen. By declaring that the purpose of the legislation to be to protect the "irreplaceable wild, scenic and recreational resources" the legislators appear to have opened themselves up to the same attacks that faced the Duxbury by-law. The Massachusetts Supreme Judicial Court is very likely to perceive any Scenic River regulations as attempts to secure public benefits without the payment of compensation.

It is also hard to see how the Massachusetts Wetlands Act can avoid the same fate as the Duxbury by-law. Both attempted to regulate the filling of tidelands in the interest of preventing harm to the ocean environment and the Massachusetts High Court has already decided that this is more of a public benefit than a harm. Even more ominous is the MacGibbon Court's suggestion that restricting a landowner's permissible uses to agricultural and recreational uses is unconstitutional in itself unless necessary to protect the safety of those who wish to live there. It would appear likely that Cohasset's Protection of Natural Features by-law and Scituate's Saltmarsh and Tideland Conservation District will also fall if challenged because they are, in all substantive regards, similar to the invalid Duxbury by-law.

It remains to be seen whether the Turnpike Realty case has even the continuing validity necessary to support the H.U.D. model coastal floodplain legislation that has been adopted by Cohasset, Scituate and Higham. It is apparent that coastal communities will not be allowed to protect their wetlands by the backdoor argument that the prohibition on filling or altering marshes is necessary to prevent flooding and erosion, unless they can substantiate the hazards. Once an area can be proven to be hazardous, floodplain legislation that prevents occupancy and construction of dwellings is apt to fare better than non-alteration provisions.

As a generalization, environmental litigants will be in the best position when they can convince the courts that the regulation is aimed at preventing harm rather than seeking public benefits, when the potential harm that the prohibited activity would generate is greater than the loss to the landowner, and when the landowner is left with other uses more practical than merely agriculture and recreation.

B. Nonconforming Uses

Comprehensive zoning, as originally conceived, was based on neatly segregated and homogeneous zones. There has always been a strong desire to get rid of nonconforming uses. In areas such as floodplains and coastal storm areas there is an even stronger desire to get rid of nonconforming structures: the ever present threat to safety. What protection is afforded existing structures and uses? What tools are at the disposal of municipalities to eliminate nonconformities, particularly safety hazards?

Historically, the early proponents of zoning recognized that the power to prohibit future uses differed only in degree from the power to prohibit existing uses. It was obvious that the losses in development potential in many cases far exceeded the loss that might be occasioned by terminating an existing use, but it was also obvious that, politically, termination would arouse public and judicial opposition. Thus zoning was compromised in its infance: the Standard Zoning Enabling Act (SZEA) would say nothing about nonconforming use, planners would concentrate on future development and everyone assumed that nonconforming uses would go away. When Massachusetts adopted the SZEA there was strong support for the position that preexisting structures and uses should be treated as vested rights, hence the following provision was added:

> except as provided in section 11a zoning ordinance or by-law or any amendment thereof shall not apply to existing buildings or structures nor to the existing use of any building or structure or of land to the extent to which it is used at the time of adoption of the ordinance or by-law... But it shall apply to any

> change in use thereof and to any alteration of a building or structure when the same would amount to reconstruction, extension or structural changes, and to any alteration of a building or structure to provide for its use for a purpose or in a manner substantially different from the use to which it was put before alteration, or for its use for the same purpose to a substantially greater extent.[119]

Even with this limited protection, nonconforming structures and uses have not gone away. Commercial uses have thrived as government sanctioned monopolies, and homes seem to last forever. Moreover, the provisions relating to altering or enlarging such uses are rarely enforced, while the variance power is often used to justify rebuilding.

In contrast to Massachusetts, many states are silent as to the protection afforded nonconforming uses and structures. In two states, the courts have found that preexisting uses are constitutionally protected, while in others no such requirement exists. The classic cases for nonprotection are the cases of nuisance law. The elimination of noxious uses, unsafe structures, and unsanitary dwellings has met with almost unanimous judicial approval. Because of the statutory protection, however, the SJC has not given its opinion, except to note in passing: "there is recognition in Section 7 that rights already acquired by existing use or construction of buildings in general ought not to be interferred with."[120]

Whether a municipality could terminate structures within floodplains and coastal hazard areas under the residential powers of the home rule amendment is a relatively closed question. Faced with the rather strong policy to protect existing land uses (except traditional nuisances), the courts are liable to declare the municipal regulation preempted. The question of constitutionality is obscured by the dubious social worth in most instances of such measures. For many poor citizens, an order to leave one's home is a grave and serious measure. The imposition of such conditions should only be occasioned by compelling justification. The American Law Institute's model land development code would allow discontinuance of existing land uses only after public hearing

and adoption of a detailed state or local plan. Authorization would also be provided to pay compensation in those cases where the elimination of existing uses would impose too great a burden on the property owner.[121]

Some states have imposed amortization timetables to eliminate non-conforming uses. For the most part, these plans have met with judicial approval as long as the time period is reasonably related to the economic life. Nevertheless, amortization has led to very few discontinuances of any substantial significance, for mostly political reasons.

A final method, which in many cases is the most advantageous, is to purchase existing structures and lands via tax abatements. This method of reclaiming open space often takes the form of granting tax-free life tenancies, in return for granting a reversionary interest to the state. A program of granting life tenancies and, when necessary, exercising eminent domain may prove the only feasible way to reclaim the critical environmental areas of the study area's coastline.

C. Other Alternatives

Two other methods of preserving open space deserve mention: Development Rights Transfer (DRT) and Dedication Requirements. DRT theory posits the government may avoid the claim of compensation by allowing landowners in critical areas a "floating" development right which may be sold to landowners in less restricted areas.[122] This proposal has met with limited success in preserving historic landmarks where landowners could have demolished and built larger, more profitable structures. Two problems hinder the general application of DRTs. The first is that some courts are reluctant to see bonuses granted. (If X can build a structure twice as high, why can't Y and Z as a matter of right?) The second problem is one of adequacy of compensation. In areas where development has outrun the economic base, DRTs may not be marketable.

Dedications (and the closely related concept of incentive zoning) provide another way to preserve open space by conditioning development on require-

ments such as provisions for commons, easements, or convenants not to develop certain areas. This technique is hindered by the Massachusetts Zoning Enabling Act[123] which prohibits dedications, except those necessary for subdivision (i.e., provision of roads, sewers, sidewalks, utilities, etc.). Many communities have circumvented this prohibition by the special permit or contract zoning approach. While developers are allowed certain matter of right uses, they often seek changes in the regulation and the community uses this opportunity to demand additional amenities. The special permit approach is subject to the criticism of improper delegation of authority to appointed officials[124] and the amendment process is often objected to as spot zoning.[125] The SJC has, however, given contract zoning some measure of approval in a case where the amendment reflected valid planning without regard to the exactions.[126]

Chapter Three
WASTE COLLECTION AND TREATMENT

CHAPTER 3 Waste Collection and Treatment

It has been projected that by 1995 the present population in each of the towns in the study area will increase approximately 75 percent (see Fig. 1-5). Planning for population growth today can provide significant benefits in the future. If population growth is not well planned many municipal services will reach design capacities and a whole gamut of problems will occur. One municipal service which requires careful planning is the collection, treatment, and disposal of liquid and solid waste.

Traditionally, in most communities, individual septic tank systems have been installed and used. However, septic tanks become unworkable at higher population densities and under poor soil conditions. For example, septic tanks and leaching fields generally become unworkable for population densities greater than two houses per acre. Moreover, adequate percolation may be inhibited or prevented by dense soils, a high water table or rocky ledge underborder. Over a period of time, soils may become clogged and thus unserviceable. These complications may require frequent servicing, and disposition of the contaminated soil may present a severe problem.

Inadequate percolation conditions often result in effluent travelling via surface runoff or ground water to low lying areas such as marshes or ponds. The effluent, being rich in nitrates and phosphates, provides nutrients to a host of organisms. If nutrient accumulation is excessive, eutrophication will take place. For example leakages from septic tanks, low percolation rates, geology, groundwater flow rates, and surface runoff characteristics are important factors contributing to nutrient build-up in Straits Pond, Cohasset. Utilizing nutrients as a food source, in the presence of sunlight, algae blooms flourish. A deficiency in dissolved oxygen may then result and disrupt the

lentic organisms. Moreover, algae blooms interfere with forms of water recreation.

Typically, the installation of a new waste water treatment system is not undertaken by a community unless it is forced to do so by an outside authority. For example, the E.P.A. is administering a discharge permit system under the Federal Pollution Control Act of 1972 which imposes a deadline on the community of Hull to eliminate the discharge of effluent into receiving waters.

Wastewater planning frequently becomes a crisis management situation in which the collection and treatment systems are designed and constructed to solve immediate problems. The design and construction of a package treatment plant in Cohasset is illustrative of the planning approach in that the State Health Department required immediate construction of a treatment plant to handle wastes from a recently built high school.

In Table 3-1 current collection and treatment facilities, system capacities and proposed system expansions are shown for each of the four South Shore communities. Because each town has exhibited a varying degree of population growth rate and concomitant land use change, the collection and treatment of sewage has been solved in different ways by each. However, the population serviced in each community is approximately the same with the exception of Hull, which is about to get its first plant. As population growth occurs, it is likely that population densities will increase in some areas requiring expansion of the wastewater collection and treatment system. Also, existing areas with marginal septic systems which may wear out in a few years will need to be serviced.

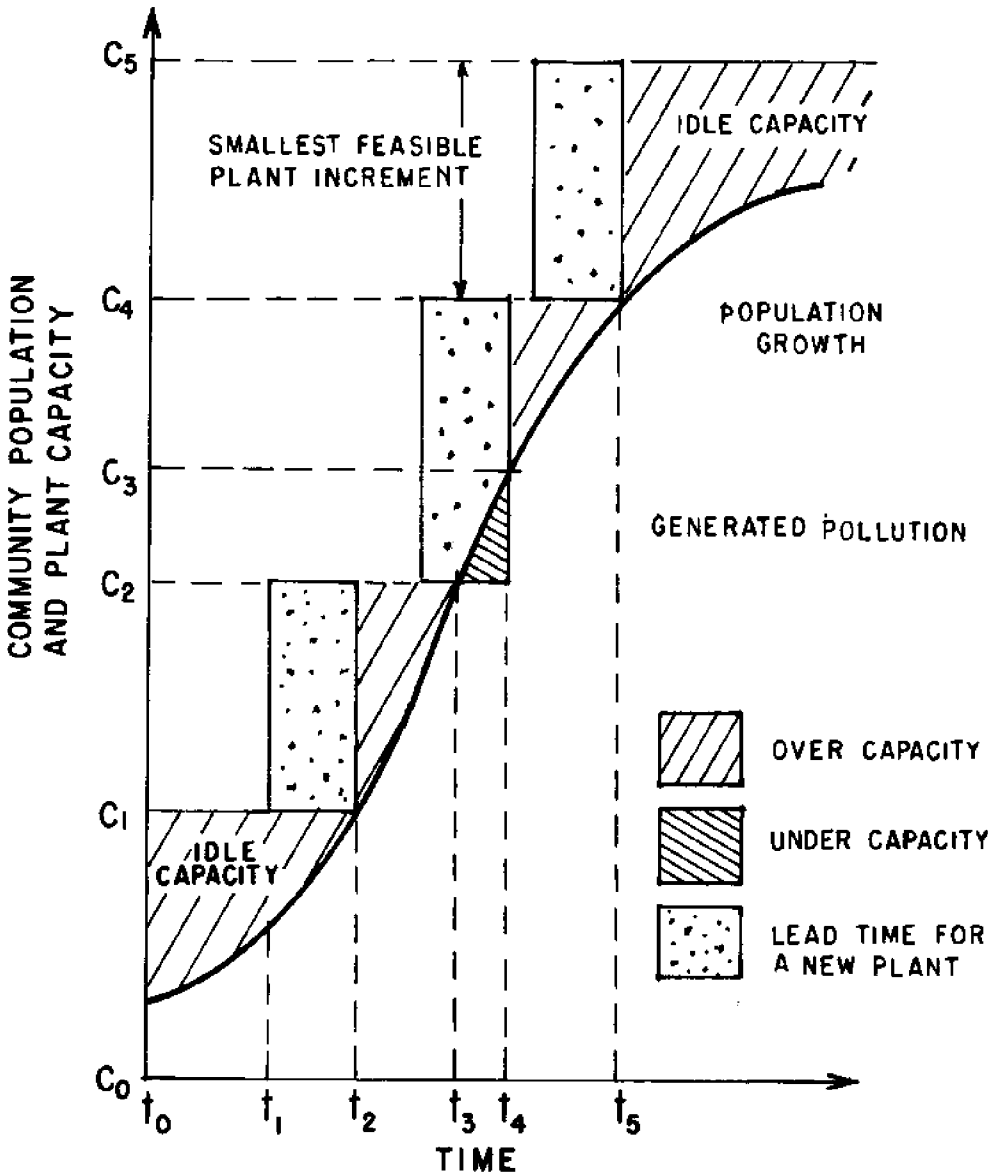
POPULATION CAPACITY RELATIONSHIPS

The expansion in sewage system capacity and population growth versus time generally exhibit the relationship depicted in Figure 3-1. Although this relationship could be used to illustrate any capital expenditure over a time horizon, for sewers the figure illustrates a number of key issues and problems for a community.

TABLE 3-1
WASTEWATER INVENTORY

Category	Hull	Hingham	Cohasset	Scituate
Area	2.4 Sq. Mi.	22.0 Sq. Mi.	9.9 Sq. Mi.	16.9 Sq. Mi.
Population				
1970	9,961	18,845	6,953	16,973
1990	22,000	32,000	13,250	35,000
Soil	Dense Formation High Water Table	Clay & Rock Around Harbor	Mostly Ledge and Hard Clay	Generally Sandy
Existing Capacity				
Type	12 Untreated Ocean Outfalls	on MDC	Activated Sludge	Extended Aeration
Size	--	3.8 mgd	.075 mgd	1 mgd
Percent Population	30%	15-20%	under 10%	20%
Disposal Effluent	Outfall	Outfall	James Brook land	sand bed filter land
Sludge	Outfall	Outfall	Spreading	Spreading
Proposal Expansion	3.06 mgd act. sludge Plant with ocean outfall and sludge incin.	No Major Plans	Expand Plant to 1.35 mgd with ocean outfall	Eventually expand to 2 mgd
Storm Drainage	No Problems	No Problems	No Problems	Sig. flooding in com. area

Source: Interviews with various engineering firms and administrating agencies involved with wastewater systems in the four towns.



Source: Osborne, James G.
"Physical-Chemical Wastewater Treatment Technology: An Analysis of Impacts to Wastewater Service"
S.B. Thesis, Dept. of Urban Studies & Planning.
M.I.T. May, 1973

FIGURE 3-1: Population Growth and Water Treatment Capacity versus Time

For example, an increase in plant capacity is traditionally undertaken over a large time horizon for economic considerations, because there are economies of scale which make it less expensive to design and construct a treatment system for an expected population 15 to 20 years in the future. These time increments pose a number of problems. Large expenditures are required for a sizeable increase in plant capacity and extension. Planning for a long-term horizon may require partial subsidy by taxpayers today to meet the treatment needs in the future. Then, too, there is an uncertainty as to whether or not the future population planned for will be realized to help pay for the service.

A second set of issues and problems arises as a result of variable growth rates. As depicted by the "S" curve, the growth rate for each town may vary over time. The variable rate places greater importance on advanced planning. An adequate amount of lead time is necessary for design, financing and construction of facilities. If an accelerated growth period is not foreseen, insufficient time may be available to bring the required capacity on line.

A third set of problems arises from the fact that large increments and variable growth rates point to problems of possible over and under capacity design. Construction of over capacity, which is shown by the idle capacity, will result in a significant amount of community resources allocated to a treatment system which may lie idle for 10 to 15 years. Failure to provide adequate capacity will result in release of untreated waste into receiving waters thereby creating pollution. The general relationships shown in Figure 3-1 can be readily applied to the four communities.

Hull, for example, may be represented as being at the point where construction of a new treatment plant will be completed in 1976. The town recently appropriated $13 million for a new 3.06 mgd plan and construction will begin in the fall. The idle capacity shown in the figure applies to the new plant because the plant is designed to serve 34,000 to 40,000 people, but initially it will serve only just over 3,000, thereby operating at only 10 percent of capacity.

Scituate may be represented as being at point t_1. The community currently has a 1 mgd plant which serves slightly over 20 percent of the population. The plant is operating at approximately 40 percent capacity. The community anticipates that another 1 mgd increment in capacity will be required by the mid-1980s, and already the necessary lead time for planning and construction of a larger plant has been recognized.

The time increments in installing collection capacity are not as dramatic as those for treatment capacity. Additional collection requirements for capacity increase and expansion are usually made annually.

PLANNING STRATEGIES

In planning growth strategies, the relative costs of sewage treatment and collection are important considerations. The idle capacity, the high cost of capital and uncertain population growth suggest that it behooves communities to build treatment and collection systems in smaller size increments closer to the point in time when the service will be needed.

Although there are economies of scale with large treatment systems and substantial state and federal grants are available for construction of treatment facilities, treatment is the smaller component in the total system cost. Collection systems do not offer economies of scale nor are substantial grants available for upgrading and expansion of collection appurtenances. A comparative estimate of the per capita treatment and collection costs for the small systems that might be employed in the four communities are shown in Table 3-2. The estimates were taken from various sources and were adjusted to 1974 costs by the use of the ENR index.

Treatment represents approximately 22 percent of the total cost for a sewage system. If 80 to 85 percent assistance were available for construction of a treatment facility, the treatment cost would be on the order of 17 to 19 percent of the total cost. Hence, for every $1 investment for treatment capacity the towns incur, an investment of approximately $24 is required for the collection system.

TABLE 3-2

COMPARATIVE ESTIMATE OF
COLLECTION AND TREATMENT COSTS

	Collection	Treatment	Total
Amount Per Person	$676	$194	$870

This estimate was made using the following sources:

Whitman and Howard, Inc., "Report on Proposed Sewerage System and Sewage Treatment Facilities, Hull, Massachusetts." Boston, Massachusetts. August, 1969.

Penjerdel, Inc., "Sewage Disposal in the Penjerdel Region; Too Little, Too Late." Pennsylvania-New Jersey-Delaware Metropolitan Project, Inc., Philadelphia, March, 1964.

Downing, Donald A., "The Role of Water and Sewer Extension Financing in Guiding Urban Residential Growth." S.M. Thesis, University of Tennessee. April, 1972.

The analysis dramatically underscores the importance of applying a portion of a fiscal budget to well-planned collection networks and draws attention to planning for anticipated land use development.

The sewage collection costs for sprawled development are significantly higher than for clustered development. Because collection costs are largely borne by the community through the floating of sewer bonds, it is suggested that promoting the development of higher density residential areas through cluster zoning would minimize the strain imposed on the fiscal budget by the need to build sewage collection systems.

Sewer bonds supporting collection costs can be considerable. The expenditures for sewer construction in Scituate from 1965 to 1973 are shown in Table 3-3. The large sums of money necessary for the financing of sewer construction have been raised largely by bonds. The table illustrates a problem confronting communities desiring any capital improvement, that is, the rising cost of capital reflected in the increasing interest rates. The most

TABLE 3-3

EXPENDITURES FOR SEWER CONSTRUCTION, TOWN OF SCITUATE, 1965-1973

Year	Expenditure ($)	Bond Term (Years)	Interest Rate (%)
1965	520,000	20	3.5
1966	1,000,000	20	3.7
1967	270,000	20	3.6
1967	175,000	19	4.2
1968	175,000	10	4.5
1969	225,000	5	5.7
1971	505,000	10	4.8
1971	135,000	5	4.8
1972	310,000	5	4.0
1973	1,105,000	5	4.25

Source: 1973 Annual Report, Scituate, p. 143.

recent bond for sewer construction was floated in January 1975 for a 5.5 percent yield. To reduce carrying costs, and for other reasons, the periods for bond issues have decreased. The immediate impact of rising interest rates and shorter terms is an increase of the annual debt service payments. For example, the 1966 and 1973 bond issues were roughly the same amount, but the annual debt service payment of the earlier bond issue was only 29 percent of the later issue. The debt service payment for Scituate for 1973 for sewer construction is shown in Table 3-4. The total debt service payment accounted for 8 percent of the town's tax rate.

The rising cost of money is not the only problem confronting planners. Between 1969 and 1974 construction costs for sewer lines and treatment plants have increased substantially as shown in Table 3-5. The percentage change in construction costs far exceeds the percentage change in consumer price indexing (CPI). The CPI in the same period increased approximately 11 percent. Rising construction costs may have accounted for one-half of the increased estimate for the Hull treatment plant which was estimated to cost $5.1 million in 1969 and is now estimated at $13 million.

Although diminution in construction costs is unlikely, sewage collection and treatment costs may be reduced.

TABLE 3-4

1973 DEBT SERVICE ON SEWER BONDS, TOWN OF SCITUATE

Issue Year	Principal payment*		Interest Payment*
1965	$ 25,000		$ 10,063
1966	55,000		24,420
1967	15,000		5,940
1967	10,000		4,620
1968	15,000		33,038
1969	45,000		1,283
1971	25,000		3,000
1972	65,000		8,500
1973	225,000		42,122
Total Payment of Debt Service	$530,000	+	$121,046 = $651,046

*Amount in Dollars

Source: 1973 Annual Report, Town of Scituate, p. 143.

TABLE 3-5

SEWERAGE CONSTRUCTION COST INDEX FOR METROPOLITAN BOSTON

Year	Sewer Line Construction Index Cost	Sewer Line Construction Percent Change	Treatment Plant Construction Index Cost	Treatment Plant Construction Percent Change
1969	148	5.4	140	7.1
1970	156	13.0	150	14.2
1971	176.3	12.6	171.3	3.9
1972	198.5	5.5	178.1	6.5
1973	209.5	31.2	189.7	22.8
1974	274.8		233	

Source: Engineering News Record

The random land use development decisions made in the past will have to be accomodated by extensive and costly collection networks. However, future judicious land use planning, including cluster zoning and planned unit development, may permit new growth to occur without allocating substantially higher fiscal funds for sewage collection systems.

In addition to zoning, innovations in advanced wastewater treatment technology may take place to yield a higher quality effluent at lower treatment costs. Likewise, physical-chemical treatment has already proven to be a viable alternative for reducing total collection and treatment costs in new subdivisions.

As indicated in Figure 3-1, the time for planning is now when priorities and objectives can be formulated which will improve the environment and will represent the most efficient use of a community's resources. Sewage system expenditures represent only one component, albeit an important one, of the costs associated with population growth. Integrated planning and growth strategies determined on a regional basis may enable the communities to realize a desirable environment with the least impact on municipal finances.

Chapter Four
TRANSPORTATION SYSTEMS

CHAPTER 4 Transportation Systems

PROBLEMS AND ISSUES

Getting from one place to another is an ever present problem for those who live in suburbia, and the residents of Hingham, Hull, Cohasset and Scituate certainly have their share of "transportation problems." As mentioned earlier nearly a third of the work force commutes to Boston.[1] Those who make the twice daily trek have discovered long ago that the road network has insufficient capacity in many locations to meet peak demands. As local population and development increase along Route 3, these problems can only intensify.

The influx of summer vacationers is an additional factor in the transportation problem. For example, Hull may have as many as 100,000 visitors on a good summer day. The long traffic tie-ups on the secondary arteries that run along the coast lines of Scituate and Cohasset are also a seasonal inconvenience.

The lack of mass transit service is another persistent woe. By any conventional indicator -- comfort, convenience, travel time or cost -- the level of service is deplorable, and capital and operating costs are high. Moreover, the sprawling nature of the study area makes it difficult to institute new services.

Clearly, any imaginative solution to improve transportation levels of service in a community raises several questions. What is the cost-effectiveness of achieving better levels of service? What are the socio-economic and environmental impacts resulting from the implementation of an innovative service in the short term? In the long term? What are the implications of implementing various control measures to curb the drive-alone mode? If a new transit service were to be introduced, what would be the demand and

supply? What are the institutional arrangements necessary for implementing mass transit?

In this chapter the existing and proposed transportation services, both for the work and intra-town trips, are examined. A demand model for travel between the study area and Boston has been devised, and the results are used to assess the economic feasibility of commuter boat service. Finally the legal problems affecting use of the abandoned Greenbush railroad, and locally initiated bus service, are briefly discussed.

THE HIGHWAY AND ROAD SYSTEM

The primary access routes from the coastal towns to Boston are shown in Figure 4-1. Route 3-A is the oldest and most important link between the communities and the center city. South of the Summer Street rotary in Hingham, Route 3A is flanked by a relatively undeveloped right-of-way. North of the rotary to where it meets the expressway there is little hope for right-of-way expansion because of commercial development separated from the roadway by only the width of the sidewalks.

Route 3, built in the 1950s, connects the study area and points south with the Southeast Expressway, the most heavily travelled thoroughfare in Massachusetts, and the eighth most heavily travelled in America. Until a recent decision was made to use the breakdown lane, the expressway was functioning at level of service F.[2] Even with the utilization of the breakdown lane, the expressway, particularly the central artery, remains highly congested during peak commuting hours. The likelihood is that reconstruction of fourteen bridge decks on this highway, to be undertaken within the next two years, will hinder traffic flow even further.

With the exception of a few Hingham residents, none of the commuters in the study area has ready access to Route 3 and the Southeast Expressway. Route 228 runs from Nantasket Beach to Route 3 and provides the primary means of access to Route 3 for residents of Hingham, Hull, and Cohasset. Route 228, however, is a narrow, winding road that traverses residential

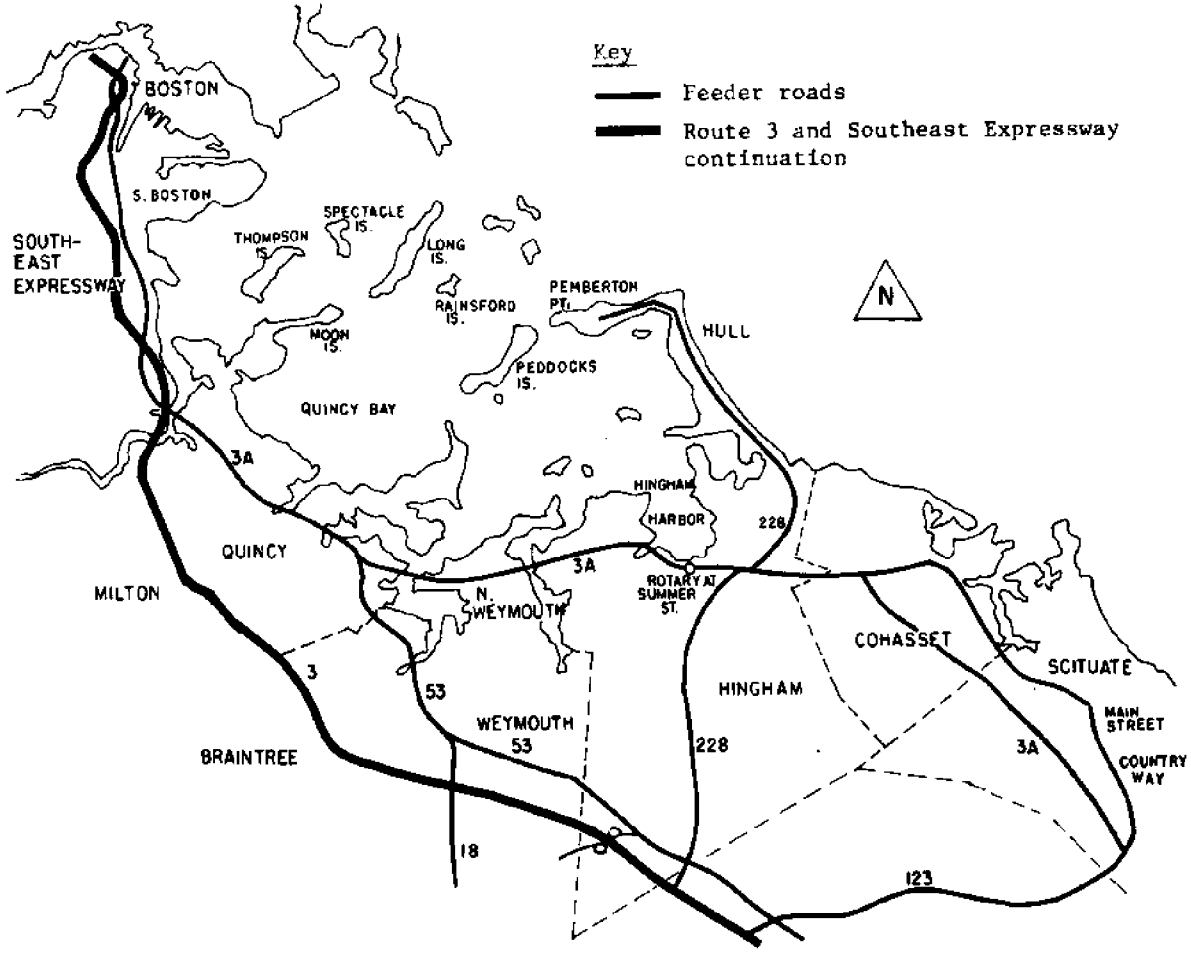


FIGURE 4-1: Study Area and Road Network

neighborhoods. For the most part Scituate commuters use Route 123 to get to Route 3. The area through which Route 123 runs is less densely developed, but otherwise suffers from the same drawbacks as Route 228.

Generally each town has an adequate system of collector streets and minor arteries that join Route 3A, with the exception of Hull during the summer months.

Because of the configuration of Hull, commuters generally use Nantasket Avenue which runs the full length of the peninsula, a distance of approximately seven miles. There are reportedly long lines of traffic along Nantasket Avenue early in the morning and in the evening. During the summer months the traffic on this avenue and George Washington Boulevard, a link between Nantasket Avenue and Route 3A, increases by a factor of three. A Route 228 bypass, to link not only the Nantasket Beach area but also Cohasset and North Scituate with Route 3, was proposed in 1969 by the Massachusetts Department of Public Works. The new spur would improve regional accessibility, although construction appears unlikely because of the growing sensitivity to large capital investments for highway construction. In addition, there is strong opposition in Cohasset to any coastal highways.

In the absence of such a bypass, most commuters will continue to travel to Boston by taking the collector and secondary streets to reach Route 3A, and then proceeding along Route 3A to Neponset Circle in Quincy, where it meets the Southeast Expressway. During the month of June 1975 a traffic count was undertaken at selected control stations along Route 3A. The traffic volumes and distribution data are shown in Figure 4-2.

EXISTING TRANSPORTATION MODES

Commuters travel from the South Shore to Boston by a variety of means: automobile, bus, rapid transit, and ferry boat. Intratown trips are largely limited to walking or auto driving with occasional busing to schools and shopping centers. The existing rail lines are used for freight transport, the majority of deliveries being made to three firms: General Dynamics, Proctor and

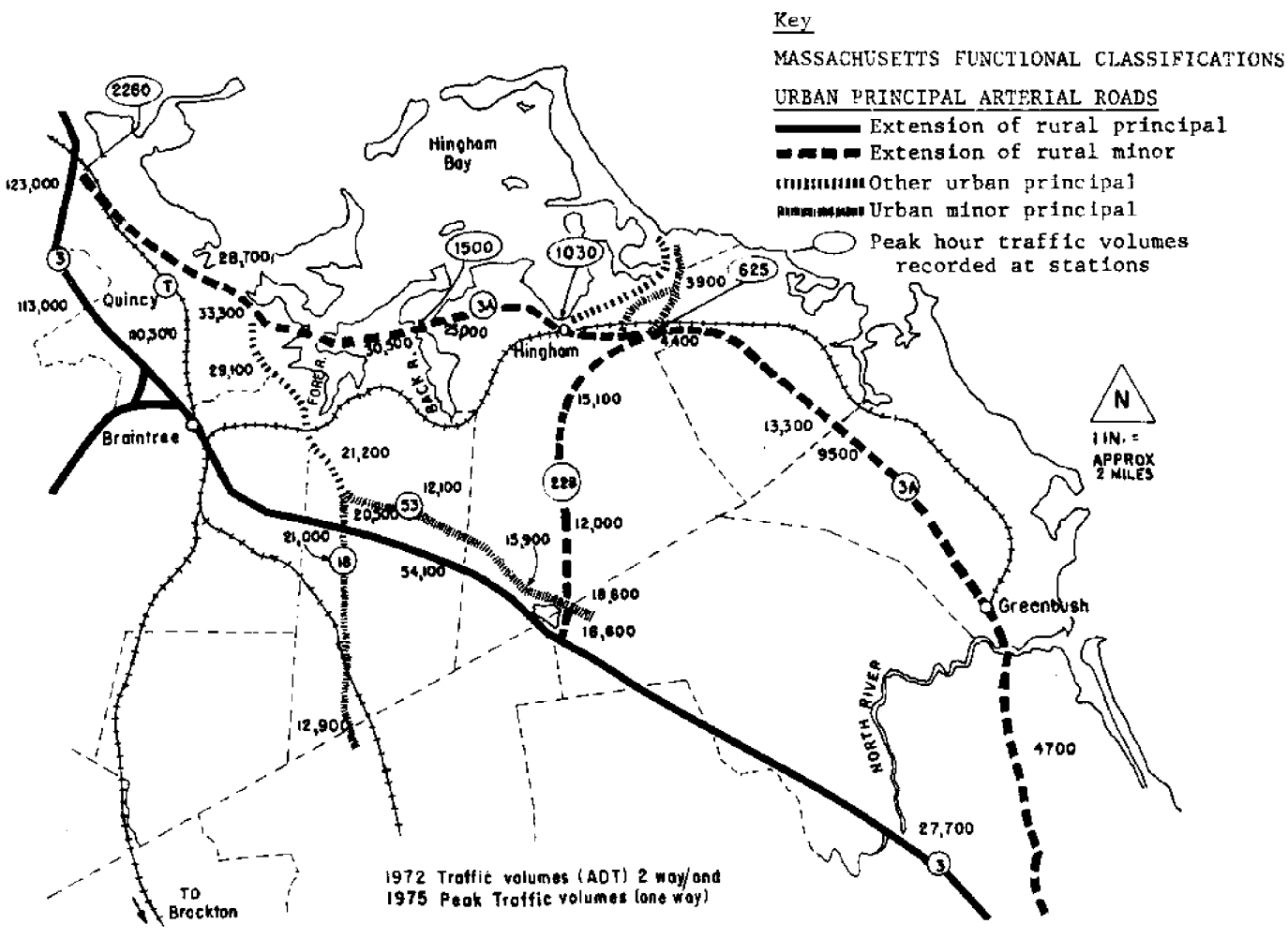


FIGURE 4-2: South Shore Area: Commuter Routes and Peak Hour Traffic Volume

Gamble, Fore River in Quincy, and General Services Administration in the North Hingham Industrial Center. The predominant modes of travel are briefly described below.

A. Automobile

The automobile is the primary mode for work trips. In the peak-hour traffic count, it was noted that approximately 72 percent of the vehicles traveling on Route 3A are automobiles with an average occupancy of 1.6 persons per vehicle. Automobile ownership and usage in the study area are higher than the national averages. A large number of families have two or more cars, and the second car provides for the bulk of intratown transportation.

Automobile use has both positive and negative aspects. Positive aspects are 1) origin destination times are reduced; 2) the automobile is private, comfortable and convenient; and 3) there is no need to conform to a fixed schedule or route. Negative aspects include high operating costs and the contribution to regional air pollution.

Automobile operating costs for South Shore commuters absorb a significant portion of the annual income of households in the study area. Furthermore, these costs can be expected to increase in the future with further increases in the cost of petroleum products. Harder to quantify, but in some ways even more significant, are the socio-environmental costs of automobiles as moving air pollution sources. An examination of emission data reveals that the national ambient air quality standards for the Boston interstate region[3] are often exceeded, and that this is primarily due to moving pollution sources. It is estimated that the study area contributes 0.2 percent of the regional hydrocarbons and 0.2 percent of the carbon monoxide. Of course, automobiles are not the only moving sources. Buses and commercial vehicles are also blameworthy, but the low occupancy level of cars (1.6 persons/vehicle) points out the inefficiency of automobiles as a transportation mode.

B. Bus System

The southeast corridor is served by four bus systems, three of which are

operated by private carriers and a fourth which is publicly operated.

Bus routes for existing services generally follow the major arteries (Figure 4-3). Patrons use various means to get to the bus depots including walking, driving, or picking up a ride from family or friends. It was noted from field research that with a walk time to the bus depot greater than seven minutes, most patrons utilize their automobile instead of walking.

The Plymouth and Brockton Street Railway Company (P&B), the largest carrier in the corridor, commences service in Greenbush, Scituate en route to Cohasset and Hingham and enters the Southeast Expressway via Route 128 (see Figure 4-3). Although there are local buses from Scituate, most Scituate commuters use the express buses which bypass Cohasset and Hingham. Commuters from Cohasset do not have express service.

Headways during the commuting period are often variable as some operators wait at depots for regular passengers who may be a little tardy.

An examination of scheduling reveals that the coastal towns appear to be well serviced by the P&B service during the week with fair to poor service on weekends (see Table 4-1). However, the patronage-capacity ratio has been steadily increasing. In a study undertaken in 1973, it was found that the patronage capacity ratio for express bus service inbound to Boston between 6:50 a.m. and 9:30 a.m. was 104 percent.[4] During 1975, instances were reported where buses filled to capacity did not stop to pick up bus patrons waiting at depots.

An examination of bus service reveals an inadequacy in mass transit between Scituate, Cohasset and Quincy Center. A survey conducted in 1973 by the Scituate Jaycees reveals a strong interest for supplementing this service. The advantages to be gained would be:

1. Better levels of service for the 600 residents of Scituate and Cohasset working in Quincy
2. New employment opportunities for non-Quincy residents
3. Accessibility to rapid transit

At the present time, the P&B and MBTA bus routes come within one mile

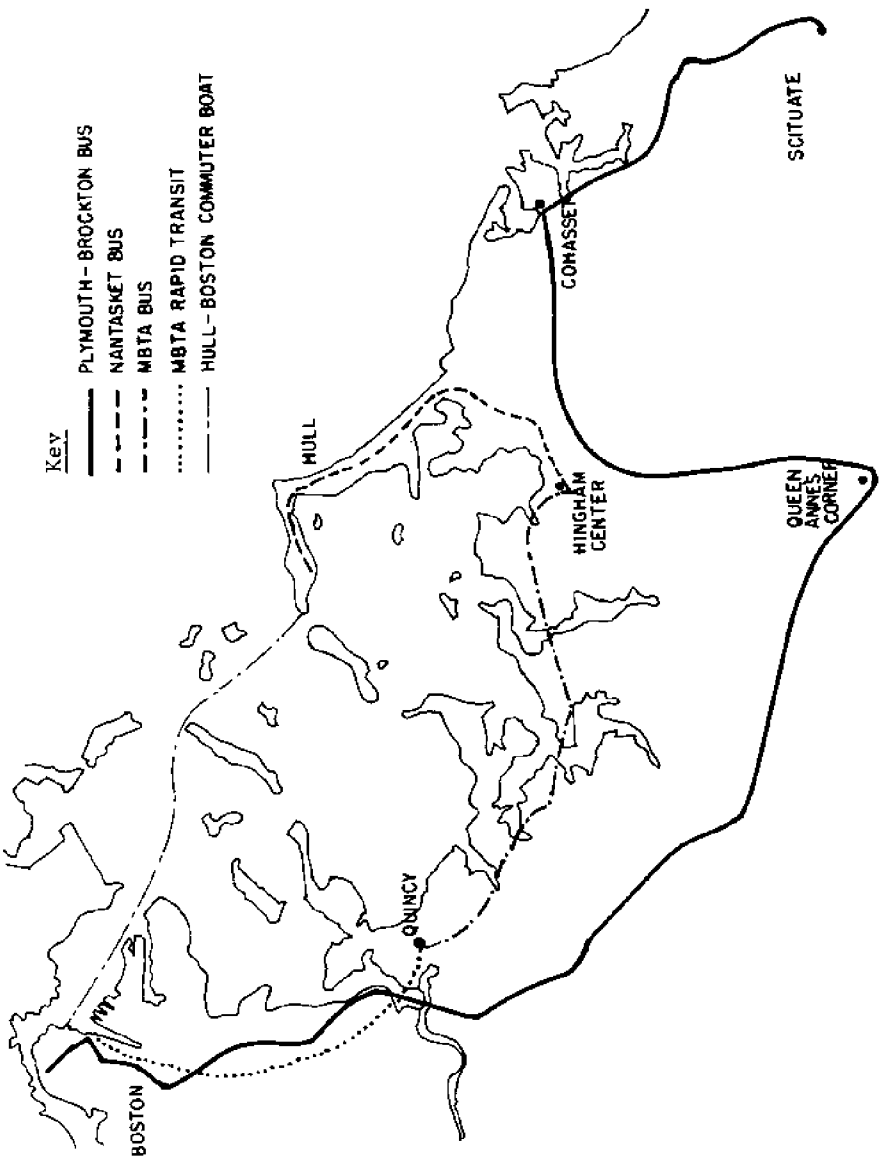


Figure 4-3: Publicly and Privately Owned Transportation Service Routes

of each other in Hingham with little possibility for exchange of patrons.

MBTA service from Hingham Center to Quincy Center is adequate during the week, with an average patronage-capacity ratio of 50 percent. The major drawback to this service is the reliance on the automobile for access to Hingham Center.

Hudson Bus Lines provides limited express bus service from Hingham Center to Government Center, Boston, during the peak commuting period, via the Southeast Expressway.

Under Chapter 161A of the Massachusetts General Laws (enacted in 1964), the MBTA was given exclusive jurisdiction over public transportation. Thus, Hudson buses are prohibited from picking up or discharging passengers along the MBTA routes. However, in a recent ruling,[5] the U.S. Department of Transportation told the MBTA to allow Hudson Bus Lines access to Quincy Center, thereby contravening the exclusive road rights granted to the MBTA. In spite of the opposition by the Quincy City Council, the prodding by UMTA may result in other carriers being granted access to Quincy Center.

The relatively poor levels of service for Hull commuters is the result of a small owner operator, Nantasket Bus Lines, restricting service due to high operating costs. As the result of the withholding of road rights to the Quincy Center terminal, the bus service makes local stops in Hull and carries riders to Hingham Center, where the patrons transfer to the MBTA bus for Quincy Center and take the rapid transit to Boston. Headways for Nantasket Bus Lines during commuting periods are approximately one hour.

C. Rapid Rail Transit

Rapid transit is provided by the South Shore extension of the Red Line to North Quincy, Wollaston and Quincy Center. The South Shore extension is a double-track line with third rail electrification constructed at a capital cost of $75 million.

Most commuters from the coastal towns board at Quincy Center, and the majority of patrons use the automobile to reach the station. On the average,

the number of commuters arriving from the coastal towns by automobile and requiring parking places is significantly higher than the parking places required by the total number of patrons arriving by automobile from other towns. A recent study of parking demand at these transit stations indicates that there are about 1.2 persons arriving daily by automobile per parking space.[6] As a result, commuters not only have contributed to traffic congestion in Quincy but also have placed a burden on Quincy to supply parking facilities.

D. Hull-Boston Ferry

Approximately 75 daily commuters leave Pemberton Point, Hull, at 7:30 a.m. and depart Boston at 5:30 p.m. for a 50 minute commuter boat ride operated by the Mass Bay Line, Inc. The patrons are primarily Hull residents although some riders from Scituate and Cohasset use the service.

In ten years of operation, weekday service has been interrupted only three times. The one-way adult fare of $1.25 and student fare of $0.75 is the least expensive means of travel from Hull to Boston.

The primary drawbacks to this service are: 1) the crafts in operation are old and need refurbishing; 2) travel to Pemberton Point requires use of an automobile; 3) travel time is excessive; 4) terminal sites require maintenance.

However the patrons appear to overlook these negative aspects or are at least willing to trade them for the scenic boat ride.

PROPOSED INTERTOWN TRANSPORTATION SERVICES

A. Commuter Boat

1. Service Description

During the past year there have been attempts to initiate a commuter boat service between Hingham Shipyard, Hingham, and Rowe's Wharf, Boston. The Massachusetts Port Authority announced in November, 1974, that it would authorize the commencement of the service by March 1975, but service did not commence until October 6, 1975.[7] Service was terminated November 28

in accordance with terms of the experiment but the boat did run for about three weeks later in the year.

In March 1975 a project was undertaken by staff of the South Shore Chamber of Commerce to identify relevant issues associated with initiating a commuter boat operation. The commuter boat of interest was the HM.2 Hoverferry manufactured in the United States by Hover Marine Corporation, Pittsburgh, Pennsylvania.

Riding on an air cushion produced by lift fans, the HM.2 is one and a half to three times faster than conventional ferry boat service. The time of travel between the South Shore and Boston over water would be approximately 25 minutes by hoverferry in comparison to 50 minutes by ferry boat. The craft has a five foot floating draft which makes it very suitable for Hingham Bay which is quite shallow at low tide. The craft is very maneuverable and safe. From a cruising speed of 35 knots, it can come to a dead stop in less than three craft lengths. Moreover, wave generation, noise, and pollution are minimal.

Because of the shallow draft, the hoverferry would have a direct route over water between terminals. Routing options for South Shore commuter transport and a more complicated network tying in Logan Airport, the Harbor Islands and other potential markets are shown in Figures 4-4 and 4-5. Rowe's Wharf provides a good terminal facility in terms of accessibility to destinations in downtown Boston or outlying areas via rapid transit. Although Hingham Shipyard needs refurbishing, an excellent dock facility exists, ample parking space is available, and there are no foreseeable zoning problems.

The HM.2 does have major limitations which may interfere with achieving a desired level of service as noted below:

a. Scheduling is a problem. An HM.2 can carry a maximum of only 60 passengers during one run

b. The amount of debris in the harbor could cause grequent damage to the hovercraft and result in high maintenance costs costs

c. An increasing number of pleasure crafts in Hingham Bay and

TABLE 4-1

BUS SERVICE

Operator	Route	Number of Trips/Day Monday-Friday	Saturday	Sunday
M.B.T.A.	Quincy-Hingham	38	29	14
P & B	Scituate-Boston	23	9	4
Nantasket Bus Line	Hull-Hingham	8	7	-
Hudson Bus Line	Hingham-Boston	2	-	-

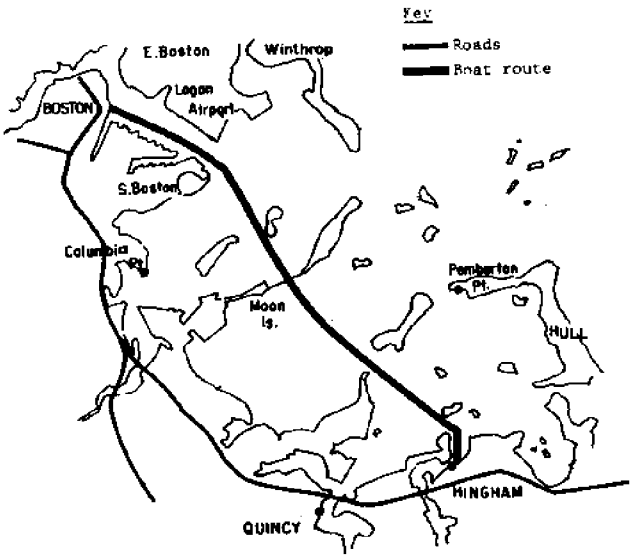


FIGURE 4-4: Experimental Commuter Boat Route, 1975

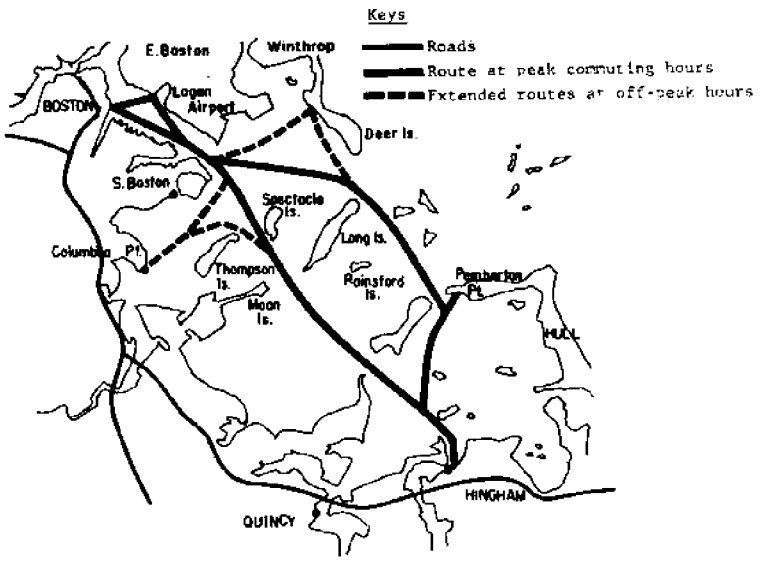


FIGURE 4-5: Proposed Commuter and Off-Peak Boat Routes

Boston Harbor may tend to reduce cruising speed and increase travel time

d. Ice formation may prevent service

2. The Prediction of Demand for Alternative Transportation Modes

To estimate the consumer demand for hoverferries in relation to the demand for alternative land transportation modes, a short-run disaggregated demand model of logit form[8] was developed (see Appendix IV for program format). The model was used to describe a work trip mode decision undertaken by a worker who commutes from his residence in one of the coastal towns to his place of employment in Boston, and returns home in the evening.

To derive an origin-destination matrix which would be applied to the model, travel information was extracted from a telephone home interview survey, newspaper sources, and census data. The travel information revealed that most communters journeyed to the Boston downtown area. Within this area three destinations were chosen, the financial area, Government Center, and the Prudential Center-John Hancock area (Figure 4-6). Zones of origins were assumed to be residential areas in each town. North Weymouth was added as a potential market source for the hoverferry service.

Previous work has shown the feasibility of transferring disaggregated demand models calibrated from socio-economic and travel characteristics in one geographic area to estimate travel demand in another area. Atherton[9] demonstrated that the transfer of a logit model calibrated from data collected in Washington, D.C. showed exceptional performance in predicting model share for the journey to work in New Bedford, Massachusetts. Given the large monetary and human resources required to derive a demand model, Atherton's research appeared to offer an excellent means to model the work trip made to and from the South Shore.

The Washington model is calibrated for the drive-alone, shared-ride, and transit modes. The approach used in transferring it to the South Shore case is to apply the vector of coefficients derived for the Washington model directly to the South Shore model instead of reestimating the coefficients

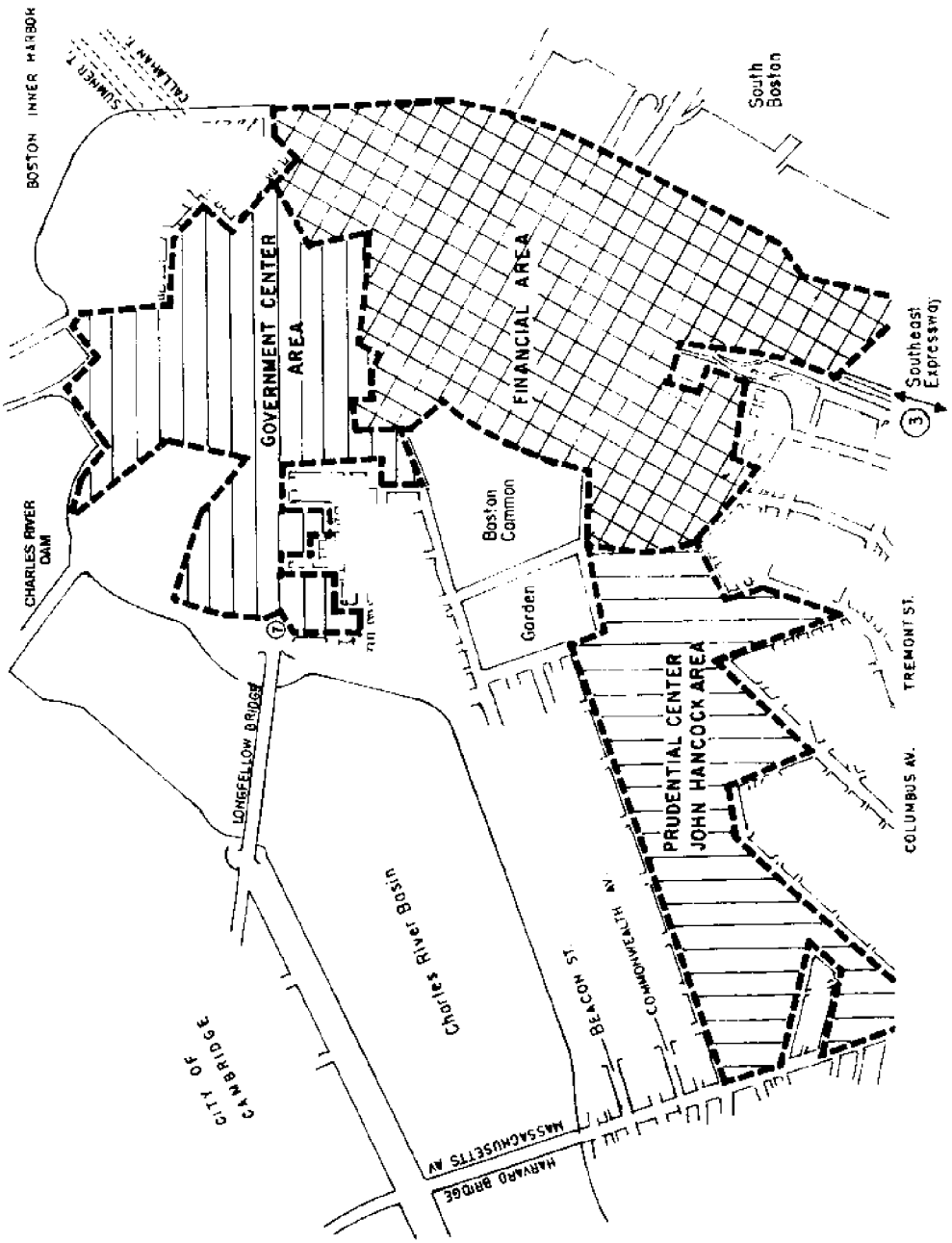


FIGURE 4-6: Survey Grid for Demand Model

or updating the original coefficients by using Bayes' theorem.

The disaggregated work-mode-choice model explains the conditional probability that an individual consumer will choose a mode from a set of all possible mode alternatives. The model, a description of an individual's behavior in evaluating a set of possible alternatives and selecting a course of action, is based on the principle of maximizing one's utility; that is, preferring one transportation alternative over others which are available.

The model incorporates a utility function described by a vector of variables characterizing a mode, e.g. out-of-vehicle travel time, out-of-pocket travel costs; a vector of socio-economic variables characterizing a communter, e.g. auto availability, household income; and a vector of coefficients.

The estimation of modal share is the probability of selecting a mode based on a model configuration which was structured as a decision tree delineating alternative mode choices. The model configuration is shown in Figure 4-7.

In applying the model configuration, it is assumed that a commuter has a choice of either driving alone, car pooling, or using mass transit. Should a commuter choose to use public transit, he has a choice of using land transportation, or water transportation (hoverferry). In choosing land transportation, a commuter may elect to ride the bus or rapid transit (conditional on access to these modes by driving alone), or car pooling.

The data base, which is comprised of a number of travel and socio-economic variables, was collected by a home interview telephone survey and field work conducted during July, 1975. A summary of the characteristics of a commuter and his household is displayed in Table 4-2.

The percentages of South Shore commuters travelling between origin-destination pairs were calculated by 1) obtaining the total number of workers for each town travelling to Greater Boston for the work trip, from 1970 census data; 2) multiplying these volumes by a factor calculated as the population growth rate from 1970 to 1975 for each town respectively; and 3) multiplying by a factor obtained from the sample representing the percentage of commuters, by town, travelling to each destination.

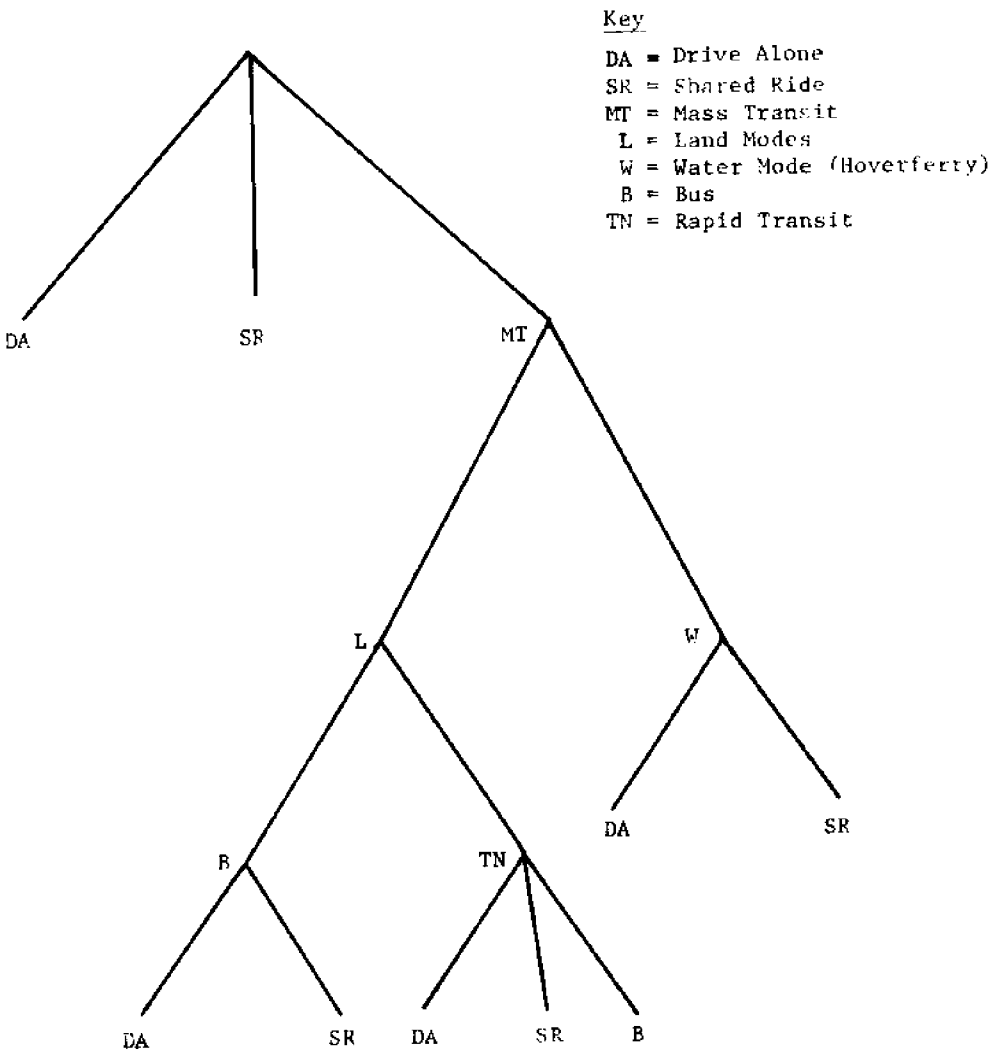


FIGURE 4-7: Cascading Demand Model Structured for the Coastal Communities (See also: flow chart, Appendix IV)

TABLE 4-2

SUMMARY OF SOCIO-ECONOMIC VARIABLES OBTAINED
FROM THE JUNE 1975 TELEPHONE HOME INTERVIEW STUDY

Town	Characteristics of a Commuter and His Household: (Mean Values and Standard Deviations)					
	Household Income ($)	Number in Family	Number of Workers	Number of Autos	Number of Drivers	Age of Commuter
Hingham	16,980	4.1±1.8	1.3±0.6	1.9±0.9	2.7±1.3	41.8±14.1
Cohasset	21,055	4.2±1.9	1.3±0.5	2.0±0.8	2.8±1.2	43.6±10.5
Hull	13,831	3.9±1.7	1.5±0.6	1.9±0.7	2.5±1.1	37.1±19.1
Scituate	18,697	4.5±1.6	1.3±0.5	2.3±0.8	3.2±1.1	39.7±12.7
No. Weymouth	18,175	3.6±2.1	1.6±0.8	2.5±1.4	2.6±1.3	32.3±12.7

Four policy options have been introduced as possible determinants of modal share:

1. A variance of hoverferry fare
2. An increase in the car operating cost
3. A decrease in car pool travel time by a factor of 0.7 by considering the establishment of special road use lanes
4. An increase in commuter boat travel time

Estimates of travel costs and travel times to the financial area are shown in Tables 4-3 and 4-4. It is shown that the round trip cost of driving alone to the financial area from Scituate is $5.02, based on a car operating cost of six cents per mile and a $2.00 daily parking charge. It is estimated that a Scituate commuter spends $1,225 or 6.7 percent of his household income annually driving alone to the financial area. The costs of driving alone to other destinations from other towns is equally expensive.

It is noted that riding the hoverferry offers no significant savings in travel time in comparison with using a car, rapid transit, or (for some origin-destinations) bus. On the basis of cost and time, car pooling is shown to be a good alternative. Only its inconvenience bars it from becoming a dominant mode.

Hoverferry offers a compromise in that the travel time is slightly less than by car, with a cost to the commuter somewhere between that of a car and conventional transit. The waiting time, the travelling from the hoverferry terminal to an employment location, and the short over-water distance between terminals tends to minimize savings in travel time by hoverferry.

The estimated hoverferry demand, resulting from the assumed description of commuter behavior described in the model configuration, was calculated by devising a computer program. The model was also run without considering the hoverferry alternative to predict the present modal share. The predicted modal share was compared with the existing modal share.

In Figure 4-7, the predictions for the work trip modal share showed good agreement with the existing modal share to Government Center, Boston. Similarly, other origin-destination modal shares showed good agreement.

TABLE 4-3

COST VARIABLES: ORIGIN TO BOSTON FINANCIAL AREA AND RETURN

Mode	Hingham	Hull	Cohasset	Scituate	No. Weymouth
Drive alone*	$4.33	$4.52	$4.54	$5.02	$3.69
Carpool*	1.74	1.82	1.83	2.02	1.48
Drive alone - Bus	2.45	2.87	2.43	3.20	2.71
Carpool - Bus	2.35	2.82	2.40	3.07	2.59
Drive alone - Train*	2.67	2.86	2.88	3.35	2.06
Carpool - Train*	1.67	1.75	1.76	1.54	1.43
Bus - Train	1.90	2.40	3.00	3.10	1.90
Drive alone - Hoverferry**	3.60	3.79	3.81	4.28	3.36
Carpool - Hoverferry**	3.24	3.32	3.33	3.52	3.15

*Includes parking costs
**Assume 1-way hoverferry fare is $1.50

TABLE 4-4

TIME VARIABLES: ORIGIN TO BOSTON FINANCIAL AREA AND RETURN

Mode	Hingham	Hull	Cohasset	Scituate	No. Weymouth
Drive alone	120	126	126	140	102
Carpool	130	136	136	150	122
Drive alone - Bus	90	188	116	152	173
Carpool - Bus	100	198	126	162	183
Drive along - Train	104	110	110	124	87
Carpool - Train	114	120	120	134	97
Bus - Train	120	192	212	242	124
Drive alone - Hoverferry	108	114	114	128	102
Carpool - Hoverferry	118	124	124	138	112

Note: Travel time in minutes. Includes in-vehicle and out-of-vehicle travel times

The model appeared to be predicting more drive-alone trips and fewer transit trips than actually take place. The shared-ride estimates showed exceptionally good agreement.

Upon introducing hoverferry into the model, modal splits for each origin-destination pair were estimated, as well as the total predicted demand summed over all origin-destination pairs.

In Figure 4-10, Curve C, it is shown that for a one-way fare of $1.50, hoverferry ridership would be 730 passengers, the commuter boat attracting 11.3 percent of the current number of commuters to downtown Boston.

In all likelihood, the implementation of a hoverferry service would not significantly decrease the percentage of commuters driving or car pooling to downtown Boston, even if the hoverferry service operated free of charge. This suggests that the automobile level of service characteristics dominate those of hoverferry.

Increasing the cost of car operation does not significantly attract more hoverferry riders (Curve D, Figure 4-10). Establishing car pool lanes would decrease ridership (Curve B, Figure 4-10). Doubling the over-water travel time which approximates the travel time of a hull boat would substantially decrease ridership (Curve A, Figure 4-10).

A sensitivity analysis showed that varying the model's coefficients by ± 25 percent would not result in any significant changes in demand volume.

3. Conclusions Regarding the Hoverferry

The commuter ills and the commuter crisis facing South Shore commuters will likely remain.

The possibility of transferring/using a demand model calibrated in one geographic area to estimate consumer demand in another area has shown significant potential.

The implementation of hoverferry service would not substantially decrease travel costs or travel time in comparison to driving alone.

The implementation of a hoverferry service for commuter service alone would not be a financially rewarding adventure for public or private investors.

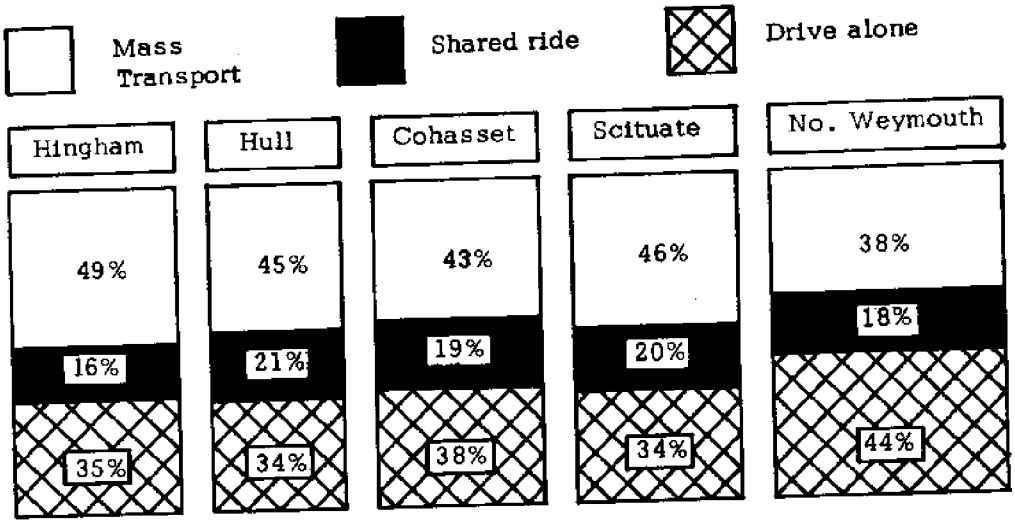


FIGURE 4-8: Existing Work Trip Mode to Government Center, Boston -- Split Percentages

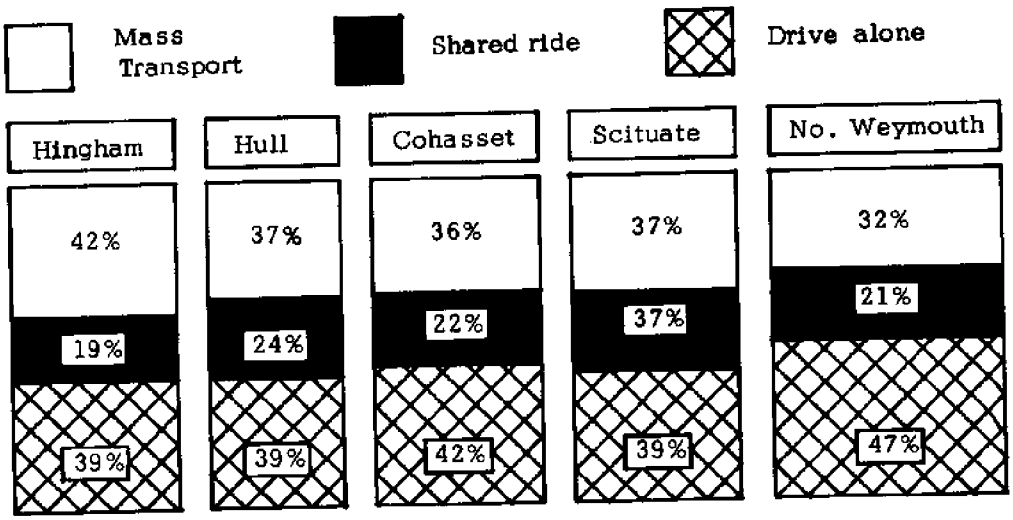


FIGURE 4-9: Predicted Work Trip Mode to Government Center -- Split Percentages Based on Cascading Demand Model of Figure 4-7

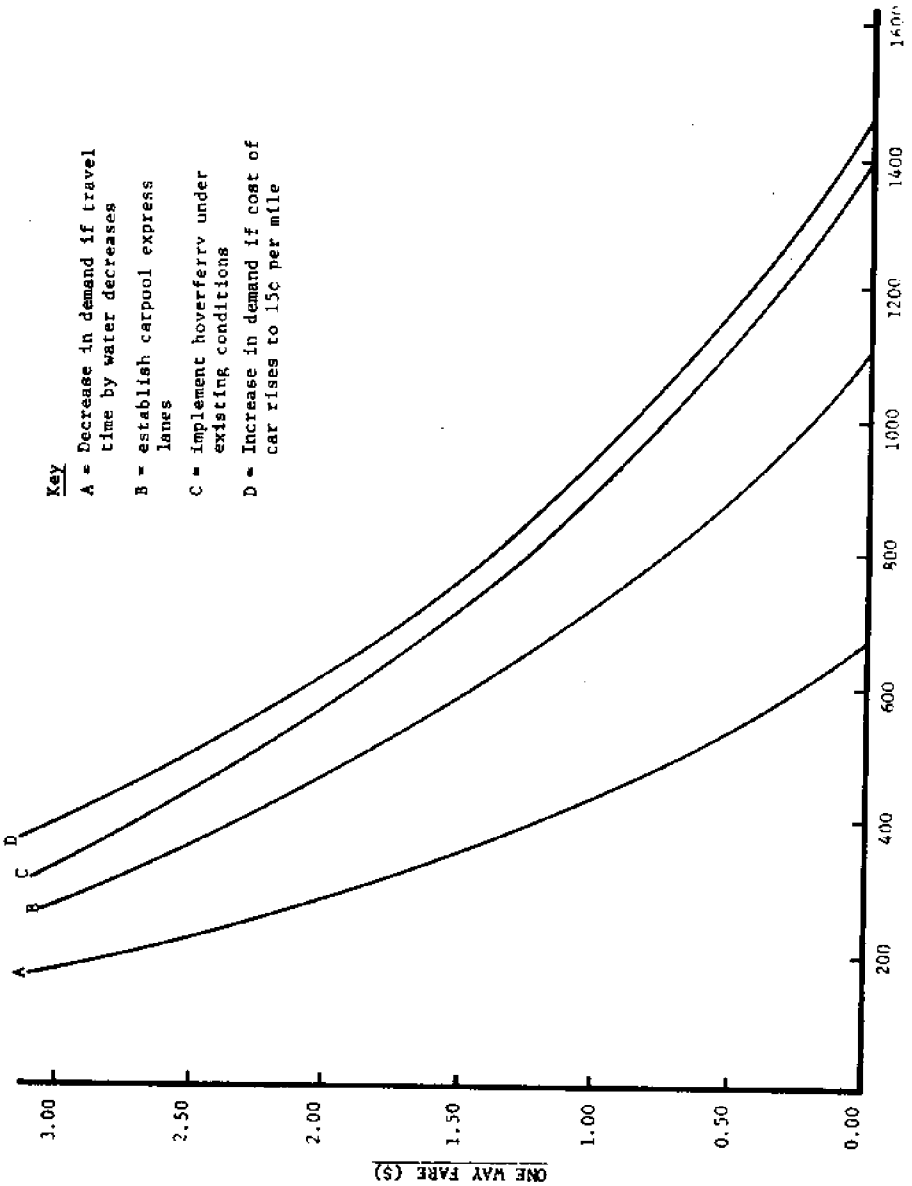


FIGURE 4-10 Predicted Total Demand Curves for Hoverferry Users from All Destinations Under Four Policy Alternatives

However, there are other potential markets which should be examined (such as the Boston Harbor Islands, the University of Massachusetts, and Harbor Cruises), which, together with the commuter boat service, may generate enough revenue to increase demand and lower the breakeven cost.

B. Development of the Greenbush Right-of-Way

With the opening of the Southeast Expressway in 1959, the Old Colony railroad line terminated service along its main lines (Figure 4-11). Although 200,000 people live within a 10 minute walk of abandoned depots, the Old Colony line lies dormant. For the coastal towns, the Greenbush Line offers transportation opportunities for (1) commuter rail service; (2) rapid transit extension; (3) busway; or (4) bikeway.

The idea of reviving the Greenbush Line for rail service is an appealing one on first consideration. However, on further exploration of the possibility many problems which might arise come to light, including a low benefit-cost ratio for restoring rail service, the need to resolve conflicts of interest between the commuters of Scituate and Cohasset desiring the service, and the interest groups in Hingham who wish to avoid the service because it would tie up traffic at twelve major intersections in the town and degrade property values along the right-of-way.

There is a further problem of a legal nature--federal subsidies would surely be required to restore the rail service. By federal law, parklands are to receive protection from encroachment by transportation facilities supported by the federal government, unless there are no feasible alternatives, or the alternatives involve uniquely difficult problems. Because the right-of-way is municipally owned by some communities--Scituate has purchased the right-of-way for the expressed purpose of recreation--the door is open for abutters along the route to challenge federal subsidy for restoration of the Greenbush Line as an illegal use of parkland. A challenge in court could very well prove disastrous to any Greenbush Line revival plan. For this reason, and because of the capital costs involved, the Greenbush Line will probably remain a natural right-of-way instead of a transportation corridor.

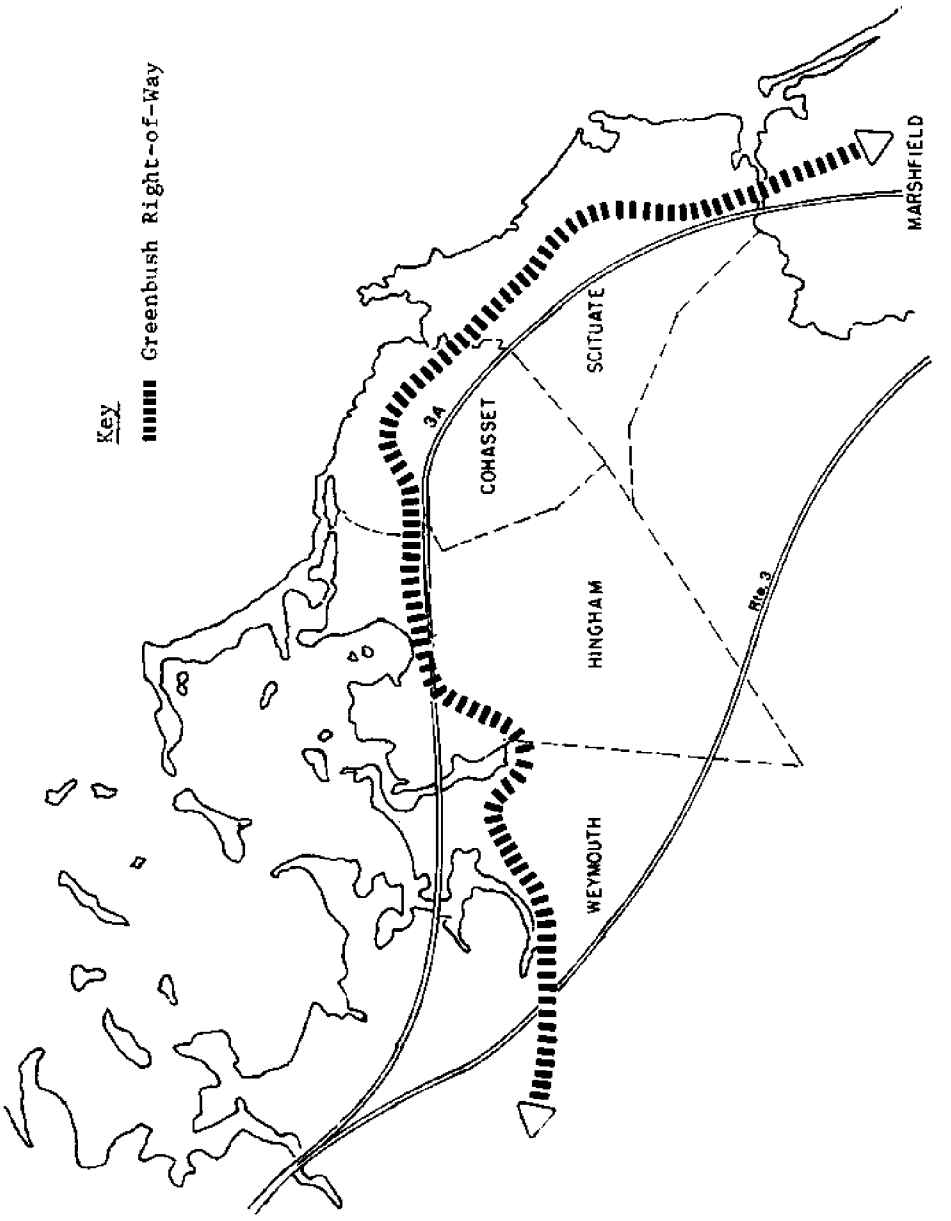


FIGURE 4-11: Old Colony Railroad Greenbush Route

INTRATOWN TRANSPORTATION SERVICE

Intratown busing is a service confined inside a town's boundaries. Hull has essentially such a service; Scituate has expressed an interest in starting one. Intratown busing is a service in which a town could move ahead on its own and remain essentially independent of the MBTA with its higher operating costs and administrative constraints. In all likelihood the MBTA would maintain regulatory power over the issuance of certificates for public convenience and necessity, but the certification process is not a serious stumbling block to intratown busing. More important is the requisite demand for the service.

The town of Sudbury has inaugurated its "Sud-bus" system using a private carrier and a $25,000 town subsidy. The level of service will have to be curtailed in the future in order to avoid increased subsidy, since the majority of users are children, not housewives and senior citizens as was originally anticipated. Moreover, the service has been relatively ineffective in discouraging people from using their cars.

Population density and concentration are two demographic constraints important in determining whether or not bus service can be supported. Generally, for conventional bus service, a population density of at least 2000 people per square mile is needed. For the use of school buses or paratransit, which resembles taxi or jitney service, densities of at least 1000 people per square mile are required. The fact that Sudbury has 600 people per square mile may be the underlying reason for the low number of riders. Although the four coastal towns have denser populations than Sudbury, only Hull and Scituate have more than 1000 people per square mile.

The viability of bus service also depends on whether there are sufficient reasons to motivate the transfer of people between concentrated areas of population. Hingham, with its somewhat more urban population concentration and commercial facilities, may have more success with busing, in comparison to Cohasset, which manifests a more suburban, or spread out, pattern of development. The motivations for the transfer of people within Scituate remain to be substantiated.

Chapter Five

CONTROLLING GROWTH

CHAPTER 5 Coastal Recreation

> "I found everywhere recent changes in the ownership of land and a movement of people of means from the cities and the interior of the country to the shore regions of the state. I found leagues and leagues together of the shoreline to be all private holdings without the intervention of these long reaches of a rod of space on the shore to which the public has a right to go. I walked across the domain of one man who owns about six miles of the shore line. I found a great population inland hedged away from the beach, and all conditions pointing to a time, not remote, when nobody can walk by the ocean in Massachusetts without payment of a fee..."
>
> -- Excerpt from the Report of Mr. J. B. Harrison to the Trustees of the Reservations, 1892[1]

Mr. Harrison's observations, although nearly a century old, still ring true. Many of the vast estates are gone, but in their place are smaller holdings, whose owners guard their exclusive possession just as zealously. Nationally, the need for additional recreation space continues to grow. The causes of the recreation explosion have been expounded frequently;[2] growing population, more leisure time, greater mobility and higher standard of living. The Massachusetts situation is particularly desperate; 940 miles of our 1200 mile shoreline are beach, or suitable for beach, but only 87 miles of the coast remain as public recreation land.[3] The situation within the study area is even bleaker. Less than two miles of the 70 miles of coast are open to the general public.

In 1970, the Massachusetts Legislature commissioned an investigation of the management, operation, and accessibility of public beaches and related matters (the Beach Access Commission). The Commission's final report and

the legislation it has generated, has done much to clarify the law, and it proposes a number of changes that would affect coastal residents. Two of the major issues in coastal recreation are: 1) public rights along the seashore, and 2) municipal exclusion of non-residents from beaches.

SCOPE OF PUBLIC RIGHTS

One of the major bills to come out of the Beach Access Commission was the "Public Right of Passage" Bill.[4] The Commission proposed that a public right of passage along the foreshore (the strip of land between high and low tide) be recognized and regulated in the public interest. Passage would be limited to daylight hours and pedestrian traffic. Certain areas, such as fenced agricultural land, structures authorized by law, or critical ecological land, would be exempted, but otherwise any attempt to interfere with this right would be punishable by fine. The bill provided that it was not to be construed as altering any existing property rights and that the right to passage was declared to be part of the reserved interests of the public in the land along the coast.

The proposed legislation was not enacted, but, rather, was sent to the Massachusetts Supreme Judicial Court for an advisory opinion.[5] The Court concluded that such a bill would violate both the Massachusetts and federal constitutions as it would appropriate private property without just compensation. While the advisory opinion was a set-back for the advocates of expanded public rights, the Court's opinion clarified a number of issues and is worth examining.

A. Historic Background

To understand the decision, it is necessary to trace a brief history of Massachusetts law concerning the seashore, and any such discussion is inevitably drawn to the Colonial Ordinance of 1647, which provided:

> Sect. 2 Every inhabitant who is an householder shall have free fishing and fowling in any great ponds, bays, coves and rivers, so far as the sea ebbs and flows within the precincts of the town where they dwell, unless the freemen of the same town, or the general court, have

> otherwise appropriated them: provided, that no town shall appropriate to any particular person or persons, any great pond, containing more than ten acres of land, and that no man shall come upon another's property without their leave, otherwise than as hereafter expressed.
>
> . . . . . It is declared in all creeks, coves, and other places about and upon salt water, where the sea ebbs and flows, the proprietor, or the land adjoining shall have propriety to the low water mark, where the sea doth not ebb above a hundred rods, and not more wheresoever it ebbs further: provided, that such proprietor shall not by this liberty have power to stop or hinder the passage of boats or other vessels, in or through any sea, creeks, or coves, to other men's houses or lands. (emphasis added)

The motives of the drafters of this document are lost to antiquity, but it is commonly assumed that the ordinance was intended to encourage the building of wharves and thus the settlement of the coastline.[6] There is considerable evidence that a battle had been raging in England between the Crown and the merchants over ownership of the tidelands and the Ordinance could have been a reaction to King Charles' attempts to seize wharves and warehouses.[7]

In any event the enumerated triad of public rights (fishing, fowling and navigation) and the cryptic term "propriety" have been the touchstones of judicial scrutiny for over three centuries. Beyond the literal meanings of the triad, the Massachusetts courts, during the nineteenth century, expanded the the public rights to include clam digging[8] and sea weed farming.[9] In 1907, however, the Supreme Judicial Court refused to expand the public rights to include bathing. In Butler v. Attorney General[10] "propriety" proved to be a construct of great importance.

The Butler case was a suit to register title to certain shorelands and to have the public rights clearly defined. The petitioner requested specific rulings from the Judge presiding over the court of land registration, among which were that the public rights in the foreshore did not include a right of bathing or fowling, nor did they include a right to walk over the foreshore for

any other purposes other than navigation or fishing. The attorney general, arguing on behalf of the adjoining landowners and the general public took the opposite view. He argued that not only were fishing and navigation public rights, but that these public rights also included fowling, bathing and "passage for general purposes when the tide was out." The judge of the land court (a lower or trial court in Massachusetts) concluded that fowling was still a public right because it was enumerated in the Colonial Ordinance, even though the absence of wild birds made it of little worth. He also concluded that bathing was not a public right, and that there was no right to passage along the foreshore for any purpose other than fishing, fowling, or navigation.[11] Both sides appealed. The Supreme Judicial Court agreed with the trial judge that fowling was still a public right and that bathing was not, but the Massachusetts High Court, for lack of adequate argument, failed to reach the question of a public right of general passage.

The courts' decision as to bathing revealed the significance of the term "propriety." Early decisions had held that the public rights in great ponds, as opposed to the foreshore, were not limited to the triad of fishing, fowling, and navigation, but rather expand to include "such public uses as the progress of civilization and the increasing wants that the community properly demands."[12] Public rights along the foreshore, however, could not expand, in the opinion of the Butler court, because the grant of "propriety" to the upland owners froze public rights in their colonial usage.

B. The Massachusetts Court's Decision on Public Passage Rights

Given this precedent, the proponents of the "Public Right of Passage Bill" had a difficult task. The main thrust of the commission's argument was that the enumerated rights should be viewed as "merely illustrative." This argument was obviously at odds with the Butler decision; nevertheless, there was considerable merit to it. At the time the Colonial Ordinance was written, there was no principle that the taking of easements or other public benefits required compensation. The colonists would not need to define with any degree of

specificity the extent of public rights,if they assumed that further public rights could be defined as the needs arose. A second, closely allied, argument was that the seashore was a unique type of property, impressed with a public trust because of the Colonial Ordinance and that the trust was capable of expansion to meet modern needs.

The court rejected both of these arguments and advised that the Butler case was controlling authority for the position that public rights on private land are to be strictly construed. In the court's opinion if the public wants a right of passage, then it must pay for it. While this begs the question of why public rights should be limited to the public needs of three centuries ago, the court's advice can be justified by the same principles that underlie most court decisions of "taking" issues. One reason for the "no taking without just compensation rule" is the fundamental tenet of equal protection. Applied in this context, equality in the eyes of the law requires that all citizens share the burden equally when society decides that it needs more recreation space. It would be unfair to have the whole burden of providing more recreation space fall upon the shoreline landowners when the benefit is shared by all. Even if the seashore is seen as a quasi-public resource different enough from other types of recreation space to avoid equal protection arguments, equitable notions, such as estoppel, probably influenced the court's opinion that compensation was required. Under equitable estoppel, courts have often held that one who by his language or conduct leads another to do what he would not otherwise have done, shall not subject such person to loss or injury by disappointing the expectation upon which he has acted. Although these principles are normally invoked by private parties, government is by no means immune to such equitable considerations. In the beach context it can be said that ever since colonial times the state has represented that title to the beaches belongs to the littoral (adjacent upland) owner, subject only to the few enumerated public rights (fishing, fowling, and navigation). Reliance on this representation has taken the form of substantial investments in homes. Opening up the beaches now would adversely affect the value and desirability of these homes, and there-

fore the state is "estopped" from expanding public uses.

A recent California case concerning ownership of tidelands has employed the estoppel principle to prevent the city of Long Beach from reclaiming land on which the defendants had built their homes. In essence, the California High Court viewed its decision as a balancing of harm to the owners who had reasonably relied on the government's previous position versus the public policy that would be frustrated.[13] Similarly, the estoppel principle is a strong agrument in favor of the Massachusetts Court's decision. Although the public need for recreation space is important, the reliance and investments of the thousands of owners of coastline homes can be said to outweigh the public policy.

ALTERNATIVE METHODS OF EXPANDING PUBLIC RIGHTS

A. Federal Intervention

Similar attempts to insure public use and passage have been advanced on the federal level. In 1973 the National Open Beaches Bill was proposed to clarify and affirm public rights. The bill provided:

> "The public shall have free and unrestricted right to use [the shoreline] as a common to the full extent that such public right may be extended consistent with such property rights of littoral owners as may be protected absolutely by the Constitution."[14]

It further authorized the United States Attorney General to bring suits for declaratory judgment in the federal courts to ascertain title. Conceivably this could reopen the issue of public rights along the Massachusetts coast. However, the nature of public rights has long been held to be a matter of state law[15], and it is doubtful that a federal court would overturn the Supreme Judicial Court's opinion, albeit advisory.

Noteworthy, however, are the rules of evidence that the bill provides for litigation. Section 205 provides:

> "A showing that the area is a beach shall be prima facie

> evidence that the title of the littoral owner does include the right to prevent the public from using the area as a common;
>
> A showing that the area is a beach shall be prima facie evidence that there has been imposed upon the beach a prescriptive right to use it as a common."

For Massachusetts litigation this could require private owners to show that the Colonial Ordinance, by enumerating fishing, fowling and navigation, intended to exclude all other rights (a point assumed by the advisory opinion). Moreover, in many areas where title is uncertain, the burden of proving even ownership might be insurmountable to the littoral possessor.

B. Follow-up State Proposals

The Beach Access Commission, after the defeat of its right of passage bill, had also suggested, but in the end did not recommend, a pro-public rights rule of evidence for Massachusetts. The bill was worded as follows:

> In any action brought or defended under this chapter and in any action to which this chapter is relevant to the determination of any issues therein, it shall be prima facie presumed that:
>
> (1) common use of a way or other route of access to shore or beach land or of shore or beach land by members of the public that has been open, continuous and uninterrupted for a period of five years is based upon a dedication of an easement of access to or use of such shore or beach land to the use and enjoyment of the public;
>
> (2) a public right to access to shore or beach land, however acquired, is for the purpose of and includes as appurtenant thereto an easement for the use and enjoyment by the public of the shore or beach land to which access is thereby afforded.[16]

This legislation, if passed, would have required an owner to prove a lack of donative intent when public use for five or more years is evident. Presently, Massachusetts law requires a clear showing of an owner's intention to grant public rights[17] before the doctrine of dedication[18] comes into play. Moreover,

the bill would provide that a showing of public access would be presumptive of public rights to use the beaches for other purposes. One final provision of the bill would quiet title in the public wherever the public has openly and continuously used a beach for 20 years or where a municipality has maintained, improved or otherwise controlled the beach for five or more years.

Some criticism has been laid against these provisions. The major argument is that the threat of presumptions would stimulate beach owners to protect their interests by prohibiting strollers when they would not otherwise have misgivings. The net effect, critics argued, would be a counter productive diminution in beach access. Proponents, on the other hand, argued that it is of utmost importance to begin to reclaim public rights, and subsequent litigation would be greatly aided by these presumptions.[19] For the study area, the quiet title provision might have been helpful in resolving many of the disputes along the beaches of Scituate and Hull, where municipal control and maintenance has traditionally been exercised, but where public title is in doubt.[20] For example, where the public has traditionally used areas of Upper Nantasket, Scituate and Humarock Beaches for more than 20 years, the land would have automatically become public by the quiet title provisions. The areas where towns have maintained the beaches (such as parts of Humarock, Upper Nantasket, and possibly Sandy Beach) for more than five years would also become public property by quiet title. The owners of the ostensibly private beaches of Scituate (near Minot and Mann's Hill) would have had the burden of proving that the beaches were not public and that they took all reasonable steps to prevent public use. Failure to prove this would have resulted in the defeat of their claims. As previously mentioned, however, this proposal was not recommended by the commission.

C. Acquisition

The most promising tack for insuring public rights along the seashore would appear to be acquisition. Condemnation or purchase would avoid the uncertainty of piecemeal litigation and the niceties of proving donative intent, custom, prescription, etc. The drawback, of course, is that it is costly.

Mitigating the expense, however, would be possible because not all the shoreland would need to be acquired, but only those portions most suitable for regional recreation areas, and in many instances only easements, as opposed to acquiring the property outright, would be necessary.[21]

There are many strong reasons for providing "just compensation" besides the fact that it is the "American way." As previously mentioned, one reason is firmly intertwined with the principle of estoppel: to the extent that the state has acquiesced for so long in private control of the shoreland, and allowed substantial development to occur along the coast, it should be required to compensate owners for the economic dislocations that occur in opening the beaches. Closely related is the principle of equality of taxation: the need for more recreational space is nearly universal and it would be unjust to have this burden fall on the small group of citizens which has chosen to invest in the shoreline.

There is a variety of federal funding programs to assist the Commonwealth in acquiring public rights. The Open Space Land Program of the Department of Housing and Urban Development provides 50 percent matching grants for acquisition of open space in urban areas. Presumably the study area, as part of the Metropolitan region, would qualify. The Land and Water Conservation Fund also provides 50 percent matching grants to state agencies engaged in planning, acquisition or development of outdoor recreation areas. Moreover, the Department of Natural Resources and the Metropolitan District Commission are empowered by the Legislature to acquire recreational lands and other property interests. The MDC plans no new acquisitions in the area studied, nor does the DNR.

The economic condition of Massachusetts is, of course, a constraint on present acquisitions. Whether acquisition within the study area would be fruitful use of scarce public funds is questionable. In recent years a number of sites in the study area have been proposed for state and regional recreation. These proposals are shown in Figure 5-1.

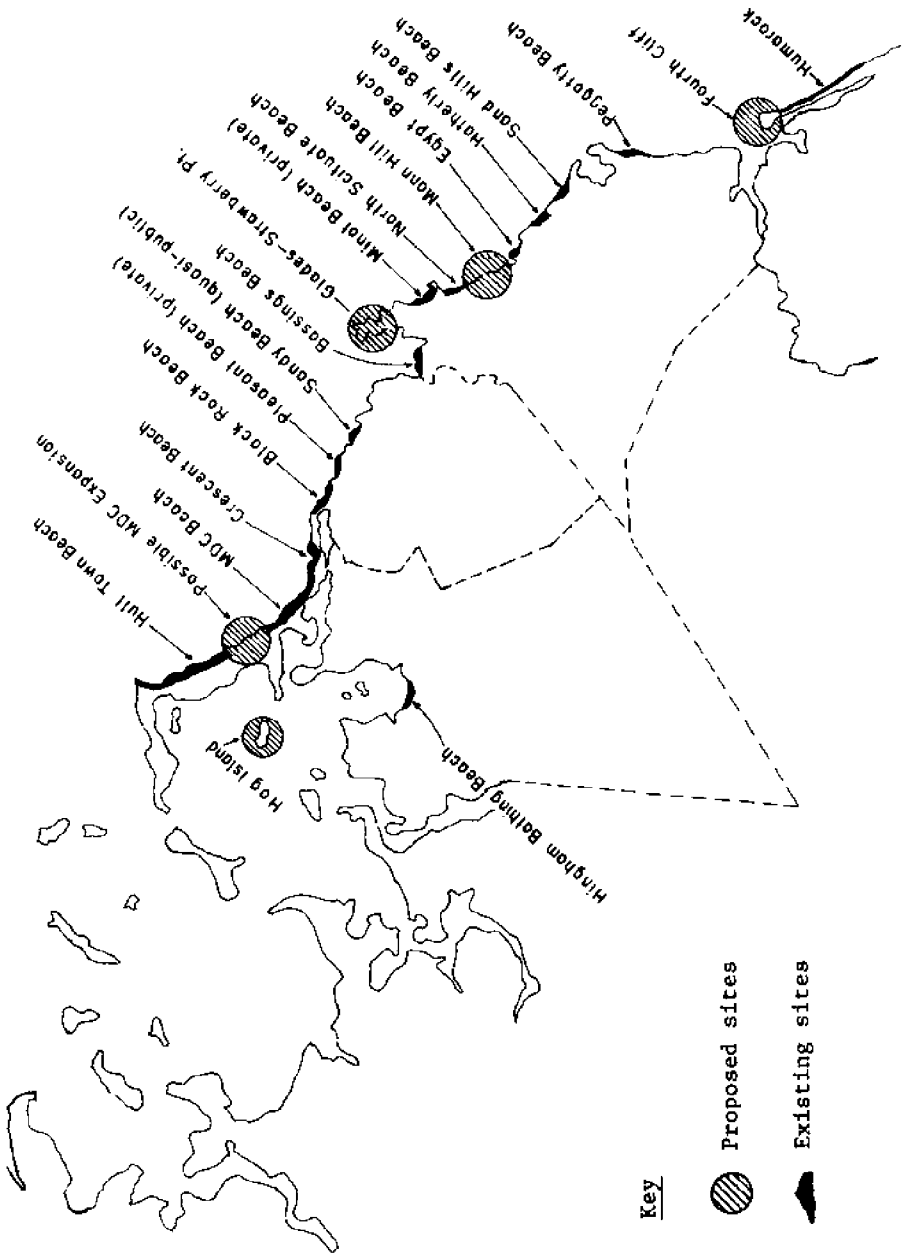


FIGURE 5-1: Proposed and Existing State and Regional Recreation Sites

Hog Island in Hull, presently a federal military holding, was a proposed acquisition in a 1969 MAPC study.[22] While it is mostly unsuitable for bathing and lacks parking capacity, it nevertheless is very attractive for marine recreation uses (such as boating) and low-density passive recreation (such as fishing and picnicking).

Expansion of the MDC Nantasket Beach is the most common proposal to help accommodate regional bathing desires. The advantages of expansion lie in the facts that a large-scale facility already exists and that costs of acquisition would be comparatively low. The major disadvantage is that expansion into any dense residential area would involve additional relocation costs and disruption of existing neighborhoods.

Acquisition of the Glades Strawberry Point area primarily for conservation and passive recreation has also been suggested. This area has little potential for bathing use, and conservation interests may already be adequately protected by the state's Wetland Act and local zoning.

Of all the ostensibly private beaches in Scituate, Mann Hill is the most suitable for acquisition. The beachfront is not located in a densely developed residential area, and the available parcels appear to have enough space for parking and a bath house. The beach itself, however, is not of high quality, consisting mainly of shingle rock.

The final frequent proposal is the purchase of the Fourth Cliff military installation from the federal government. Again, this area has little bathing potential. The scenic vistas, however, make this area suitable for passive recreation.

MUNICIPAL EXCLUSION OF NONRESIDENTS

The recent trend to prohibit or restrict nonresident use of the few existing public beaches involves a variety of methods. Some towns have excluded nonresidents outright, while others have achieved the same result by excluding nonresidents from parking lots, or by charging discriminatory fees. The issue of exclusion is important because, with the exception of Nantasket, all

the public beaches in the study area are under municipal control. Moreover, a number of the ostensibly privately organized beach associations also deny access to outsiders. The growth of the adjacent inland towns and of the metropolitan area will ineveitably lead to demands for greater access to these areas.

The capacities of public beaches within the study area are shown in Table 5-1. In Hingham there is only one small bathing beach and it is owned by the town and restricted to town residents, according to posted signs. Non-residents are excluded from the town parking lot adjacent to the beach. In Hull, the MDC facilities, of course, are open to the general public. Likewise, the Hull town officials have not taken any steps to exclude the public from the town-owned beaches. The lack of parking, however, effectively limits

TABLE 5-1
PUBLIC BEACH DATA

Town and Beach	Length (Ft)	Width (Ft)	Area (sq ft)	Capacity* (people)	Parking Places
Hingham					
Bathing Beach	600	50	3,000	400	252
Hull					
MDC Nantasket	5,808	30	174,240	2,323	2,100
Town Nantasket	13,200	50	660,000	8,800	on street where legal
Crescent Beach	2,112	20	42,240	563	-0-
Cohasset					
Black Rock	Gravel, poor facilities not developed				-0-
Sandy Beach	500	50	25,000	333	300
Scituate					
Bassings Beach	Inaccessible, not developed				-0-
North Scituate	2,500	50	125,000	1,667	300
Egypt	800	50	40,000	533	150
Sand Hills	2,500	40	100,000	1,333	30
Jericho	550	50	27,500	367	-0-
Peggotty	1,500	70	105,000	1,400	280
Hummarock	2,000	70	140,000	1,867	150

*Capacity based on recreational standards of 75 Sq. Ft. per person

Source: Town Reports, Interviews

general use.[23] There is a similar lack of parking along Cohasset's beaches, with the exception of Sandy Beach. There the town has built and now supervises a large parking facility for residents, all of whom belong to the private beach association. In Scituate, ownership of long stretches of the shoreline is in doubt with the town, private beach associations and home owners all claiming title. Scituate has built a number of parking areas and hired attendants to prohibit out-of-town beach goers.[24] Illegally parked cars are fined $5.

To many residents this issue stimulates emotional arguments on various levels. The gut reaction is: these are our beaches; nonresidents should seek out recreational facilities within their own towns to meet their needs. Proponents of public access respond just as emotionally in asserting, as a historic and social reality, that the seashore is a fundamental resource of the entire Commonwealth. The proponents of open beaches also argue that while towns are instrumentalities of the state created in the belief that many decisions are best made on the local level, to read into this home rule philosophy a right of coastal towns to monopolize the seashore would be contrary to the best interests of the Commonwealth.

The Beach Access Commission, aided by Professor Rice of Boston University School of Law, has suggested a number of legal attacks on municipal exclusionary practices. One basis for opening up the beaches would be the general laws that require that parklands be forever maintained and kept open to the public.[25] Presumably, "parkland" is broad enough to include beaches and the "forever open to the public" requirement could easily be construed to mean the general public.

A second tack would be a revival of the dynamic trust theory rejected in the advisory opinion on public passage. While the court held that public rights could not expand on private land, it intimated no opinion as to the scope of public rights on public land. Thus it could be argued that municipal land is open to the general public not just for fishing, fowling, and navigation but for all modern needs.[26] The New Jersey High Court recently upheld this view and held that equal access "represents a deeply inherent right of the citizenry,"

traceable to the Magna Carta.[27]

Furthermore, it would appear that a municipality that has traditionally opened its beaches might be barred from subsequently attempting to close them, the theory supporting this view being that the opening of a town beach for unrestricted use constitutes an irrevocable dedication to the general public. The New York courts have upheld this view.[28] A second ground for such a decision would be based on the Massachusetts Public Trust Doctrine that required legislative approval whenever public lands are diverted from one use to another.[29] Any change from general access to resident-only access would thus consitute a change of use requiring approval.

The problem of non-resident exclusion via restricted parking facilities was also discussed by the Beach Access Commission. Proponents of open access argued that logically it must be viewed as merely another impermissible attempt to exclude non-residents. Even if one accepts the abstract proposition that a town may build parking lots for the exclusive use of residents in some instances, the fact that the parking facilities in question have no reason to exist except as beach parking areas dictates that the parking lots, just as the beaches themselves, be open to the general public. The open beaches faction concluded that to allow such de facto exclusion would be to exalt form over substance.[30]

Allegations of discriminatory fees reveal another facet of the non-resident problem. The argument is often made that public beaches and parking facilities are purchased and maintained by town funds raised via property taxes. It is only fair, the local communities argue, that non-residents pay their share through admissions fees. Open beaches proponents charge, however, that many communities with a fee structure utilize their beaches as profit-making ventures with a purpose of subsidizing other town beaches used solely by town residents or discouraging non-resident use altogether. Our study of beach operations in Hingham, Hull, Cohasset and Scituate reveals that none of the beaches in these communities is a profit-making operation. In fact none of these beaches is operated on a fee basis. MDC parking fees are

the same for residents and nonresidents. The municipal parking lots have no fee structures; residents are free, nonresidents are prohibitied.

Fee structures, of course, may be implemented in the future to relieve some of the pressure for open beaches. Conceivably admissions fees would be charged along many South Shore beaches, but any system where nonresidents pay as they go and residents are charged as part of the property tax poses serious valuation problems. It is difficult, if not impossible, to judge how much use the resident and nonresident each gets for his dollar. Although the Massachusetts general laws allow a community to defray costs by either admissions fees or municipal taxes,[31] the members of the Beach Access Commission who favor open beaches would like to rule out combination systems, because of these valuation problems. Their advice would seem to be for communities to avoid using tax funds at all, charge all users equally, and pay all expenses from the funds collected.

A final issue is that of the private beach association which excludes nonresidents. While a basic principle of private property is that an owner may exclude or admit persons to his land at his unfettered discretion, it must also be noted that private associations may be influenced by, or controlled by, "state action" to the extent that the same obligations as for a public organization will attach.[32] Thus, a high degree of "state action" will trigger a responsibility to insure equal protection of the law -- in this case, the right to equal public use. Some members of the Beach Access Commission suggested that the requisite degree of state action might be found in delegation of management for public beaches to private associtions, in municipal sales of beaches to such organizations where the purchase price is below the fair market value, in municipal agreements to maintain the ostensibly private beaches, or in municipal parking facilities for the sole benefit of these organizations.

THE EFFECT OF OPENING MUNICIPAL BEACHES

One proposal before the Beach Access Commission was a bill that would substantially codify the suggestions of the open beaches faction.[33] It would

prohibit the exclusion or restriction of non-resident use of any state, district, county, or municipal beach except on terms, including charges, equally applicable to both residents and non-residents. Communities which wished to continue to charge residents property taxes and non-residents admissions fees would have to satisfy guidelines promulgated by the Secretary of Environmental Affairs in order to insure equality of assessments. Finally, any private beach association which discriminates between classes of the general public would be denied tax exempt status.

This proposal poses a number of problems. First, most of the beaches we have studied are narrow and rocky. Many are incapable of supporting any more than their present users. Second, additional usage could generate substantial traffic problems because of the density of coastal residences. Third, the opening of Massachusetts beaches would probably affect the South Shore more than any other area because of its proximity to Boston. At present the communities of Hingham, Hull, Cohasset and Scituate would be unable to control this demand.

Nevertheless, it is our opinion that opening up the beaches should be a goal of the Commonwealth because of the long-term benefits to the state and the communities. As we have already mentioned, the continuing growth of southeastern Massachusetts can only lead to greater pressure for public recreation space. As twentieth century society moves from a system based on status and privilege to one based on equality, it is anomalous to allow the right of enjoying the seashore to hinge on what side of the town line the citizen buys or rents his home.

Moreover, it can be said that the future of the study area rests in its resort and tourist potential. Each of the towns already realizes substantial revenues from its marinas and harbor moorings. The town fathers of Hull have proposed a convention center as part of their redevelopment program. A large portion of retail trade of each town comes from summer residents and tourists. It would appear that it is eminently in the best interest of all the coastal communities to foster greater use of the seashore.

The gist of the beach crisis is thus the problem of reconciling the needs for greater recreation space with the local desires to preserve their environment. The substantial investments in homes and expectations of a pleasing semi-rural atmosphere to raise families can not be easily overlooked. The two interests are not, however, impossible to reconcile. There are a number of techniques for expanding and nurturing beaches to provide additional capacity. Similarly, traffic problems can be eased or alleviated by peripheral parking lots and shuttle buses.

But, of course, this means expenditures of state funds and it raises additional questions. The study area is already densely populated. Placement of additional regional facilities here will necessitate large acquisition costs and community dislocations. Could not these funds be better used to create regional recreation areas in less densely developed areas such as the Boston Harbor Islands?[34]

In short, there is a great need for a true regional recreation plan. The policy of opening beaches to all should be joined by a commitment by the state to fund sufficient facilities and transportation systems to avoid overcrowding of the coastal environment. This should be an integral element of any system of coastal zone management.

Chapter Six

SUMMARY AND RECOMMENDATIONS

CHAPTER 6 Summary and Recommendations

HOUSING

The cost of housing along the South Shore has become prohibitively expensive for most citizens. The vast majority of present housing units are single-family detached homes. Nearly all the vacant land is zoned for more single-family detached homes. Singles, young marrieds, and retired couples find it difficult to move into (or remain in) the coastal communities. Low and moderate income citizens, likewise, have difficulty finding housing that they can afford. In the long-run exclusionary practices (zoning to maximize property taxes) may prove socially divisive on the local and regional level. The Massachusetts Zoning Appeals Law is plagued by local opposition for mostly economic reasons: residents see low and moderate income housing as having a high demand for municipal services and a low yield in tax dollars. Furthermore, developers have been reluctant to use the state appeals process because the costs and time delays of litigation make front end cost unbearably high.

Recommendations:

1. Any long range solution to the exclusion problem will have to sever the tie between property values and municipal services. The regressive property tax should be replaced (or be significantly reduced) by a statewide tax and the revenues derived should then be distributed according to municipal need. The legislature should begin by examining the merits of recent Federal Reserve Bank proposals.

2. There is a need to evaluate the Massachusetts Zoning Appeals Law in terms of its goals of providing adequate low cost housing throughout the metro-

politan area. It is suggested that more vigorous state and local involvement (through housing authorities, land banking or a state development corporation) may be necessary.

3. In any event, there is a need for different types of housing. Communities should reexamine their preoccupation with the single-family detached homes. Cluster and low rise multifamily developments may be less expensive in terms of municipal services and may provide better tax returns. More importantly, higher density development in some areas can help to preserve open space in other areas, and provide a variety of housing types that more closely approximates both regional and local needs.

CONSERVATION

The local ability to manage and conserve natural resources has been stimulated by sound state laws that have placed initial responsibility in the hands of local officials and by the Home Rule Amendment which has given towns the power to pass their own laws so long as they do not conflict with explicit state policies. The Federal Flood Insurance Program and the State Coastal Zone Management Plan will also intensify local planning efforts.

Recommendations:

1. In adjudging the validity of conservation measures, the Massachusetts court appears to be moving towards an ad hoc balancing approach. Planners are best advised to document the public harms that environmental measures are aimed at preventing and to be prepared to prove that these public harms are greater than the burdens that regulation will impose on landowners.

2. Without more strict enforcement of the "no alteration provisions" and more stringent use of the variance power, nonconforming uses will continue to pose a problem, particularly in coastal hazard areas. A possible solution is a state sponsored program of acquisition either by granting life-tenancies and tax abatements or by exercising eminent domain.

3. While mandatory dedication of space is not permissible under Massachusetts law, the special permit or contract zoning approach may allow communities to negotiate for conservation measures. For special permit systems to pass muster, it appears that the town meeting must lay out explicit standards to guide the board of appeals. In contract zoning, towns are in the best position when the rezoning can be justified by itself without reference to the benefits given up by the landowner.

THE PLANNING PROCESS

There are three pervasive problems in the localized planning process: first, there is continuous potential for myopic decision-making, particularly with regard to seeking tax ratables and avoiding undesirable but necessary types of development. Second, there is a schizophrenic tension between the formal and informal planning systems. Formally, almost all changes in the zoning scheme must be made by the elected officials or by a town meeting, but informal changes are quite frequently made by appeals boards through the misuse of the variance and special permit powers. Finally, there is a bewildering proliferation of local bodies that make land use decisions: selectmen, planning boards, appeals boards, conservation commissions, renewal agencies and housing authorities, to name a few.

Recommendations:

1. There are a number of proposals for strengthening state and regional planning capacity. A state land use policy and particularly a coastal zone management policy are long overdue. It appears that state and middle level government will assume a greater role in land use planning by either reviewing local decisions or hearing appeals in two broad areas: 1) critical environmental concerns and 2) developments of more than local significance. Local officials should become familiar with the proposals (particularly the review mechanism and the criteria for identifying critical environmental concerns and regional development) and work closely with state legislators to insure that

benefits of localized decision-making (local expertise and capacity for close supervision) are not lost.

2. While many decry the informal zoning process as contrary to the zoning act, the fact that it exists may point out a need for revising our present system of land use controls. The flexibility of an administrative proceeding may be better, in the long run, than the highly emotional town meeting. Zoning, as presently practiced, is a static system. It assumes that a community can sit one day and decide what is the best use of land districts for decades to come. Perhaps this is unrealistic and should be replaced by a dynamic system where administrative officials have discretion to decide on specific development proposals. (This discretion would, of course, be limited by procedures and policies adopted by the town meetings.)

3. Consolidation of local land use decision-making bodies should be a long term goal. Where this is not feasible, efforts should be made to increase coordination (i.e. joint meetings on problems that two or more local bodies share, sending of observers, circulation of minutes and agenda).

WASTE COLLECTION AND TREATMENT

As long as population continues to grow, the disposal of wastes, particularly waste water, will continue as a planning problem for each of the communities and the region as a whole. Poor soil conditions and increasing population densities will reduce future reliance on septic systems. In addition, more stringent governmental regulations, such as the Water Quality Act of 1972, will require greater purification, if not elimination, of effluent discharges.

A number of factors must be considered to plan efficient treatment systems. First, there are economies of scale in building such facilities. That is, once a location and system are decided upon, building twice as much capacity will rarely cost twice as much money. A second countervailing factor is the problem of tying up large amounts of capital on the mere estimate of future population. Over capacity will result in a significant amount of commu-

nity resources lying idle. Under capacity will result in the release of untreated waste. Third, there is the problem of collector systems. For every dollar invested in treatment, the communities have been spending $24 in collection. Fourth, the rapidly rising costs of borrowing money and of construction must be considered and finally, there is the possibility, lurking in the wings, that a technological breakthrough in small package chemical treatment may make its entrance.

Recommendations:

1. While economies of scale should be analyzed, the idle capacity problem, high cost of capital and uncertainty of population growth suggest that it behooves communities to build treatment and collection systems in size increments closer to the time when the service will be needed.

2. Idle capacity problems might also be solved through regional planning and cooperative arrangements between towns.

3. Municipal collection costs can be diminished by encouraging cluster development through zoning and planned unit development. Statutes requiring new subdivisions (if large enough) to provide their own physical-chemical treatment facilities may also be feasible.

4. In the long run the integration of planning and growth strategies, determined on a regional basis, should be realized. In this manner a desirable environment will be preserved with the least impact on municipal finances.

TRANSPORTATION

Continuing population growth, more stringent environmental control measures and ongoing reliance on the metropolitan region for jobs indicate that the community is likely to face longer travel times and more inconvenience unless mass transit is drastically improved. Improving bus service is an obvious beginning. A demand model for water transportation indicates the feasibility of service between Hingham and Boston, especially if subsidies or off-peak hour markets are available. Reactivating the abandoned railroad line

through Hingham, Cohasset and Scituate is a less attractive alternative because of residential development along the right-of-way and desirability of the land as a linear park. Finally, there is the possibility of new highway construction, although funding has been severely diminished, and in many instances such construction would be counterproductive, as it would only lead to new development. Nevertheless, there are limited options, such as bypassing Route 228 and expanding Route 3A, which deserve engineering analysis.

Recommendations:

1. Efforts should be made to reduce automobile use between the South Shore and Boston, particularly by the single driver. Short-term solutions may lie in state mandated reductions in metropolitan parking spaces and special tolls for single drivers. In the long term, communities should adopt development patterns such as clustering residences to facilitate mass transit.

2. To meet demand and potential conditions of overcrowding, inconveniences and decreasing levels of service, it is recommended that the town selectmen approach the MBTA and private carriers for improvements in the available transit service. In particular, the selectmen should approach the MBTA for extension of direct bus service to the Quincy Center terminus. Additionally, the communties should examine the possibility of providing their own public transportation as prescribed under Chapter 159B of the Massachusetts General Laws.

3. To test the potential market for a communter boat, a demonstration project should be undertaken over a three month period between Hingham shipyard and Rowe's Wharf and Long Wharf, Boston, utilizing a hoverferry. Furthermore, a study should be undertaken to examine the transportation system requirements for supplementing commuter use of the service with recreational use within Boston Harbor.

4. To preserve the high-speed operating characteristics of Route 3A south of the Summer Street-3A rotary, the towns of Cohasset and Scituate should limit the number of access roads which may be planned to intercept 3A by limit-

ing development along the right-of-way. Furthermore, the improvement of key intersections will be imperative in maintaining high-speed operating characteristics.

5. Unless summer boat service is an overwhelming success, the Nantasket traffic situation will continue to worsen. Upgrading the highway system, or providing parking near Route 3A and shuttle busses appear to be the only solutions. It seems that highway improvements alone along Route 228 will not solve the traffic problem and the selectmen of Hingham and Hull should support, in principle, a by-pass road to connect Nantasket with Route 3.

COASTAL RECREATION

In Massachusetts, public rights to use the seashore are narrowly circumscribed. Private beachfronts are not "commons" to swim from, sunbath on, or walk across. This judicial vigilance can, at least in part, be attributed to the principles of the equitable estoppel. Ever since colonial times, the state has represented that title to the beaches belongs to littoral (adjacent upland) owner, subject only to the few enumerated public rights (fishing, fowling, and navigation). Reliance on the representation has taken the form of substantial investment in homes. Opening up the beaches would adversely affect the value and desirability of these homes, and therefore the state is estopped from expanding public use.

Even in areas that have traditionally been open to the public, courts will rarely declare public rights without an explicit dedication on the part of the owner. The situation is almost as bad for nonresidents at public beaches. They are often denied parking privileges, or even outrightly prohibited from using these "municipal" resources.

Recommendations:

1. State and federal proposals to open private beaches in the form of "rules of evidence" deserve careful consideration. They may have the bad side effect of making private beach owners more vigilant, but they may also

be beneficial to the study area by allowing the towns to lay claim to areas that have been traditionally open to the public. Vindication of public rights in these areas differs from creating a general right of passage in that private littoral owners have not relied on representations on the part of the state that the flats belong to them, but rather they have been faced with the opposite -- a long standing assertion of public rights. Furthermore their acquiescence in public use negates any reliance factor that is traditionally necessary to "estop" state interference with private rights.

2. Because the population of southeastern Massachusetts will continue to grow, there will be increasing demand for recreational space. Given the strong trend towards equality, a privilege to enjoy the coastal recreation areas based on residency will become harder and harder for the majority of Massachusetts residents to swallow. It is nearly inevitable that municipal beach exclusion will be prohibited by legislation.

In the long run greater access to coastline may be in the best interest of the study area because the future economic strength of the four communities lies in resort and recreation markets (tourist retailing, marinas, convention centers, resort entertainment, etc.). Any effective action, however, must include an orderly expansion of facilities while preserving the environment which has been the essence of the area's desirability. Coastal towns should begin to assess the present capacities of their beaches, the possibilities for expansion (with state funds) and methods of traffic control (i.e. park-and-ride ferries). With this data, the communities of the study area will be in a far better position to negotiate a regional recreation plan that will finance coastal improvements and shift demand from the densely developed South Shore to alternatives such as the Boston Harbor Islands.

APPENDICES

1. For further information on geological landforms see Vol. 1, Department of Natural Resources, Massachusetts Outdoor Recreation Plan (1971)

2. Thoreau, Cape Cod 4 (1866)

3. For further historic information see Mathews, The Naming of Hull (1905); Hingham Tercentennial Commission, History of Hingham (1935); Cohasset League of Women Voters, Cohasset Through the Spyglass (1964); Pratt, The Early Planters of Scituate (1929); Bigelow, History of Cohasset (1898); Deane History of Scituate (1831); Garrott, The Pilgrim Shore (1900); Eddy, Hingham (1885)

4. Rachlis and Marqusee, The Landlords 37-40 (1973)

5. Ibid.

6. For the purpose of Figure 1-3, 'Economic Base' includes commercial, industrial and extractive activities; disposal sites; and transportation systems such as port and dock facilities and freight or storage yards. 'Infrastructure' includes municipal buildings and parcels devoted to such diverse activities as water supply pumping, churches, and military installations. In addition, it includes schools, playgrounds, and open space recreation areas such as beaches. Forest reservations and wooded parks are, however, not included.

7. The data for Table 1-12 are a further breakdown of the percentages of residential acreage as previously described in Figure 1-3. Note that the figure indicates that 65 percent of the study area's residential land is occupied by small lot homes and that this is not the same as saying 65 percent of the study area's homes are on small lots. The number of homes will be greater than 65 percent.

8. Telephone interviews with local housing authority officials indicated that the bulk of public housing was for the elderly (Hingham: 62 units; Hull: 40 units; Scituate: 128 units; Cohasset: 0 units). Hull also had 28 units of rental subsidy housing built under an early Veterans' Administration Program, and Scituate had 26 units of rental assistance housing built under Ch. 121B, s. 42 of the General Laws. None of the communities appear to have taken advantage of the Federal Scattered Site Rental Assistance Programs.

9. Hull Redevelopment Authority, The Urban Renewal Plan (1969)

10. Paul Weir Associates, Future Land Use and Transportation Plan (Summary Report to the Hull Planning Board 1973)

11. Devanney, Derbis, Seifert and Wood, Economic Factors in the Development of a Coastal Zone (Sea Grant Project Office, MIT, Cambridge, Ma. (1970)

1. For a comprehensive discussion using this approach, see Cutler, Legal and Illegal Methods for Controlling Growth on the Urban Fringe, 1961 Wisc. L. Rev. 370

2. See Lionshead Lake Inc. v. Wayne Township, 10 N.J. 165, 89A 2d 693 (1952). See also Haar, Zoning for Minimum Standards: the Wayne Township Case, 66 Harv. L. Rev. 1051 (1953); Noran & Horrack, How Small a House -- Zoning for Minimum Space Standards 67 Harv. L. Rev. 967 (1954); Haar, Zoning for Whom? -- In Brief Reply 67 Harv.L. Rev. 986 (1954)

3. M.G.L. Ch. 40 s.2 (St. 1959, C. 607 s.1) It should be noted that by giving communities the power to require new homes to be built with at least 768 square feet of floor area, the legislature has implicitly given communities the power to ban the standard 720 square foot mobile home.

4. M.G.L. Ch. 111 s. 127A (St. 1965 c. 898)

5. Petaluma v. Construction Industry Association, 522 F. 2d 897 (9th cir 1975) rev'g Construction Industry Association v. Petaluma, 375 F. Supp. 574 (N.D. Cal 1974); Golden v. Planning Bd, 30 NY 2d 359, 285 N.E. 2d 291, 334 NYS 2d 138 appeal dismissed, 409 US 1003 (1971). See also Bosselman, Can Ramapo Pass a Law to Bind the World 1 Fl. St. L. Rev. 234 (1973); Comment, the Limits to Permissible Exclusion in Fiscal Zoning 53 B.U.L. Rev. 453 (1973).

6. Cora v. Town of Arlington, 1975 Mass. Ad. Sh. 1753, 329 N.E. 2d 733 (two years is not an unreasonable length of time to withhold apartment building permits while the town undertakes and completes a thorough review of its comprehensive plan). See also Miller v. Bd. of Public Works of Los Angeles, 195 Cal. 477, 234 P. 381 (1925) appeal dismissed 273 U.S. 781 (1925) of. Steel Hill Dev. Inc. v. Sanbornton, 469 F. 2d 956 (Ist Cir. 1972) (6 acre holding zones approved to give town time to draw up comprehensive plan).

7. 311 Mass. 560, 42 N.E. 2d 516 (1942).

8. 311 Mass. at 565-566, 42 N.E. 2d at 519.

9. 364 Mass. 598, 195 N.E. 2d 341 (1964).

10. There are some indications that the Sharon Court saw the 2.3 acre zone as an attempt to reserve future conservation and recreation land and thus held that preserving open space cannot be achieved by zoning but rather can only be achieved by condemnation or purchase.

11. 1975 Mass App. Ad. Sch. 643, 326 N.E. 2d 922.

12. An unanswered question is how long Sherborn can expect to remain in this pristine state, a scant 25 miles from Boston and within the path of Metropolitan expansion. Also unanswered is why Sherborn couldn't install sewers through special districting or assessments. Compare, Nat'l Land Inv. Co. v. Cohn 419 Pa. 504, 215 A.2d 597 (1965); Appeal of Girth 437 Pa. 237, 263 A.2d 395 (1970), where the Pennsylvania courts suggested that towns in the path of urban development have a duty to install sewers.

13. See Babcock and Bosselman, Suburban Zoning and the Apartment Boom 111 U. Pa. L. Rev. 1040 (1963); Rosenthal, the Suburban Apartment Boom Suburbia in Transition (Masotti ed. New York 1974)

14. Metropolitan Area Planning Council, Residential Zoning in the MAPC Region, p. 12 (1972).

15. Brett v. Bldg Comm'r, 250 Mass 73, 145 NE. 269 (1924); Bamel v. Bldg. Comm'r, 250 Mass 82, 145 NE 272 (1924).

16. Village of Euclid v. Ambler Reality, 272 U.S. 365 (1926). In sustaining the exclusion of multi-family homes from certain Districts of the village of Euclid, Justic Sutherland made this vehement comment in passing.

> With particular reference to apartment houses, it is pointed out that the development of detached house sections is greatly retarded by the coming of apartment houses, which has sometimes resulted in destroying the entire section for private house purposes; that in such sections very often the apartment house is a mere parasite, constructed in order to take advantage of the open spaces and attractive surroundings created by the residential character of the district. Moreover, the coming of one apartment house is followed by others, interfering by their height and bulk with the free circulation of air and monopolizing the rays of the sun which otherwise would fall upon the smaller homes, and bring ing, as their necessary accompaniments, the disturbing noises incident to increased traffic and business, and the occupation, by means of moving and parked automobiles, of larger portions of the streets, thus detracting from their safety and depriving children of the privilege of quiet and open spaces for play, enjoyed by those in more favored localities,-until, finally, the residential character of the

neighborhood and its desirability as a place of detached residences are utterly destroyed.

17. 416 U.S. 1 (1974)

18. Granby v. Landry 341 Mass 443, 170 NE 2d 364 (1960)

19. M.G.L. Ch. 140 ss. 32 A-L

20. 343 Mass 591, 180 NE 2d 33, 96 ALR 2d 226 (1962).

21. Bartke and Gage, Mobile Homes Zoning and Taxation 55 Cornell L. Quarterly 499 (1969); Manchester v. Phillips, supra note 19; Marblehead v. Gilbert, 334 Mass 602 137 NE 2d 921 (1956)

22. Zoning for multi-family dwellings as a matter of right was proposed for the driftway area of Scituate in Downe, Multi-Family Housing Study Scituate Massachusetts (1962). On the other hand, the proposed rezoning of Hull would cut back on both density and amount of land zoned for multi-family dwellings. In effect it would reduce the number of apartments that could be built by 75 percent. See, Proposed Zoning for Hull Massachusetts (1975).

23. Residential Zoning, supra, note 14

24. Suburban Zoning, supra, note 13

25. The proposed Hull Bedroom restriction reads as follows:

> D. Residential C District (R-C)
> 1. Uses permitted by right:
> a. Low-rise multi-family residential not to exceed 2 1/2 stories or 35 feet height, whichever is less; and not to exceed six rooms, excluding bath or half-bath rooms, per dwelling unit, of which two rooms may be bedrooms for up to one-half of the dwelling units on any lot, and for the remaining dwelling units on the lot, one room may be a bedroom.

26. Southern Burlington County NAACP v. Mt. Laurel 336 A 2d 713 (1975) Aff'g in part 290 A 2d 465 (1972) App. dismissed

423 U.S. 808: Molino v. Mayor and Council of Glassboro 116 N.J. Sup. 195 281 A 2d 401 (Law Div. 1971)

27. Weirs, Growth or No Growth for Hull (Planning Study submitted to the Selectmen and Planning Board June 6, 1974)

28. Cf. 122 Main St. Corp. v. Brockton 323 Mass 646, 84 NE 2d 13 (1949)

29. Cf. Caires v. Building Comm'r 323 Mass 589, 83 NE 2d 550 (1949)

30. Cf. Cross v. Planning Bd 345 Mass 618, 189 NE 2d 189 (1963)

31. In the Simon case (supra note 6) the court, after hearing evidence that smaller homes would have less value and therefore raise municipal tax rates, remarked that municipal finance "might be considered as an element more or less incidentally involved" in zoning, 311 Mass at 565 42 NE 2d at 519. Likewise, the Manchester court (supra note 19) concluded that a town which prohibited mobile homes could do so for the purpose of protecting the values of adjacent conventional single family homes. These statements, however, must be weighed in light of the admonishment of the Simon case; zoning cannot prohibit the thrifty merely to protect the values of existing large estates.

32. 416 U.S. 1 (1974) rev'g Borass v. Belle Terre, 475 F 2d 806 (2d cir. 1973)

33. In City of White Plains v. Feraioli, 313 NE 2d 756 (1974), the highest state court in New York refused to extend a "3 unrelated individuals" prohibition identical to Belle Terre's to group homes for neglected or abandoned children. The New York court distinguished Belle Terre as a case dealing with "termporary living arrangements" for college students.

34. Skinner v. Oklahoma 316 U.S. 535 (1942)

35. Shapiro v. Thompson 394 U.S. 618 (1969); Cole v. Housing Authority, 435 F 2d 807 (1st cir. 1970)

36. Village of Euclid v. Ambler Realty Co., 272 U.S. (1926)

37. Ambler Realty v. Village of Euclid, 297 F 307 (6th cir. 1924)

38. Newton v. Cambridge, 277 U.S. 183 (1928); Village of Belle Terre v. Borass, supra note 32

39. Steel Hill v. Sanborne 469 F 2d 956 (1972) (6 acre lots approved)

40. United Farmworkers of Florida Housing Project Inc. v. City of Delray Beach, 493 F 2d 799 (5th cir 1974) (racially discriminatory refusal to allow tie-in to sewer system); Parkview Heights Corp. v. City of Blackjack, 467 F 2d 1208 (8th cir 1972) (racially motivated incorporation and zoning); Crow v. Brown, 457 F 2d 788 (5th cir 1971) aff'g 332 F. supp 382 (NDGA 1971) (racially discriminatory denial of special permit); Kennedy Park Home Assn v. City of Lackawanna, 436 F 2d 108 (2nd cir 1970) cert. denied 401 U.S. 1010 (1971) (long history of racial segregation and discriminatory denial of subdivision approval); Dailey v. City of Lawton, 425 F 2d 1037 (10th cir 1970) (racially discriminatory denial of special permit).

41. Warth v. Seldin, slip decision no. 73-2034, 43 USLW 4906 (June 25, 1975)

42. Slip decision at 4, 43 USLW at 4907

43. Id. at 12, 43 USLW at 4910

44. Id. at 17, 43 USLW at 4911

45. Id. at 22, 43 USLW at 4913

46. Id. at 25, 43 USLW at 4914 ; compare the Blackjack case, supra note 40, where both the corporation forming for the specific project and the corporation furnishing "seed money" had standing to raise 13th and 14th amendment claims of discrimination against future low and moderate income tenants. In the Blackjack case the land had been acquired and architectural and engineering plans completed.

47. Id. Brennan's dissent at 4-5, 43 USLW at 4916

48. Id. Douglas' dissent at 2, 43 USLW at 4915

49. Southern Burlington Co NAACP v. Mt. Laurel, supra, note 26.

50. Williams, Mt. Laurel: A Major Transition in American Planning Law Vol. 27 No. 6 Land Use and Zoning Digest 33 (1975)

51. Camden Civil Rights Ministerim-Neighborhood Groups Coalition v. Nardi, Civil No. 1128 - 70 (DNJ October 11, 1972).

52. By grounding his decision in the New Jersey Constitution, Justice Hall effectively shut the door to federal, court or state legislative intervention. The Town's petition for certionari was subsequently denied by the U.S. Supreme Court.

53. Mt. Laurel supra note 25, 336 A2d at 713, fn. 3; see generally Scott, "'Sic Utere...' to the regional general welfare," Vol 27, No. 6 Land Use and Zoning Digest 27 (1975)

54. The court cited for comparison the National Land case, supra note 11.

55. See Rose, Mt. Laurel: It is based on Wishful Thinking, Vol. 27 No. 6 Land Use and Zoning Digest 18 (1975)

56. The court did not define region except to say that confinement of a region to a county did not appear realistic. Perhaps further clarification will come from Oakwood At Madison Inc. v. Madison Township, 117 N.J. Sup. 11, 283 A 2d 353 (1974) N.J. appeal docketed. In Madison the trial court defined region as the area from which in view of available employment and transportation the population of the township would be drawn absent invalidly exclusionary zoning.

57. Bosselman, The Quiet Revolution in Land Use Control 164 (1970); Rodgers, Snob Zoning in Massachusetts 1970 Ann. Surv. Mass. Law 487; Comment, Exclusionary Zoning, A Legislative Approach 22 Syracuse L. Review 583 (1971); 7 Harv. J. Legis. 246 (1970); Note, the Massachusetts Zoning Appeals Law: First Breach in the Exclusionary Wall, 54 B.U.L. Rev. 37 (1974).

58. M.G.L. Ch. 40B ss. 20-23.

59. 1973 Mass Adv. Sh. 491, 294 N.E. 2d 393 (1973)

60. Id at 532, NE 2d at 424

61. Pending the outcome of this case 20 appeals had been stayed by the Department of Community Affairs. Some developments had been stalled for 4 years.

62. M.G.L. Ch. 40B ss. 22, 23

63. The committee is composed of five uncompensated members. Three members are appointed by the Commissioner of DCA and two are local officials appointed by the Governor. This make-up of the committee hopefully provides for a state-local balance.

64. M.G.L. Ch. 40B s.20 (the term "reasonable" is redundant. A decision is reasonable if and only if it is consistent with local needs) 1973 Mass Adv. Sh. at 514, n. 17, 294 N.E 2d at 413 n. 17).

65. The Statute provides three quotas: if low and moderate income housing accounts for 10 percent or more of the locality's housing as reported by last federal census, or if low and moderate income housing comprise 1.5 percent or more of the land zoned residential, commercial and agricultural, or if the permit would lead to construction of low and moderate income housing on three tenths of one percent of the privately owned zoned land or 10 acres of such land in one calendar year, then the town is exempt from the state review process.

66. Planning Office for Urban Affairs v. Scituate Board of Appeals, decision of the Housing Appeals Committee (March 14, 1975).

67. Brenner, Review of Legislation on Land Use and Development Planning, Vol. 2 Proceedings of the Land Use Subcommittee of the Special Commission of the Effects of Growth Patterns on the Quality of Life in Massachusetts, p. 77 State House Printing Office (1975)

68. Id.

69. Eisenmenger et al, Needed: a New Tax Structure for Massachusetts, 1975 New Eng. Econ. Rev. 3; Eisenmenger et al, Options for Fiscal Reform. (Research Report No. 57, Federal Reserve Board of Boston 1975)

70. Sudbury v. Comm'r of Corps, 1974 Mass Ad. Sh. 2405, 321 NE 2d 641; Shopper's world v. Framingham, 341 Mass. 366, 203 N.E. 2d 811 (1965); Coan v. Beverly, 349 Mass. 575, 211 N.E. 2d 50 (1965).

71. Wheaton, The Statewide Impact of Full Property Revaluation in Massachusetts, (Special Study Federal Reserve Bank of Boston 1975). Professor Wheaton, an economist at M.I.T., forecasts an average rise in home property taxes of 16 percent. It is doubtful that the study area would be effected this drastically because of low industrial capacity and the presently high valuation.

72. For the rise in business activity in suburbia, see Mass. Div. of Employment Security, Massachusetts Cities and Towns -- Employment and Wages in Establishments subject to the Massachusetts Employment Security Law by Major Industrial Divisions 1967-1973, (1974)

73. See generally, Downs, Opening up the Suburbs (1973)

74. See generally, Suburbia in Transition, supra, note 13.

75. Personal income taxes consume 2.8 percent of a Massachusetts resident's income as compared to a U.S. average of 1.5 percent. U.S. Bureau of the Census, Government Finances in 1972-73 Table 18, pp. 34-38, and State Tax Collections in 1973, Table 6, p 10 (1973)

76. Eisenmenger, Needed: A New Tax Structure for Massachusetts and Options for Fiscal Reform, supra, note 69.

77. The formula would be similar to the present equalizing grant program which distributes lottery proceeds. For a more detailed discussion of alternative distribution formula, see, Options for Fiscal Reform, supra, note 69 at 123-134.

78. Some of the unresolved factors are the choice of distribution formula, the constitutionality of graduating the income tax by reducing Federal tax exemptions at higher income levels and the amount of state mandated tax abatements.

79. The target expenditure would be $1,000 per pupil. Any locality now spending less than $1,000 per pupil would receive what it is now spending plus half the difference between that amount and the $1,000 target. If a municipality is now spending over $1,000, it would receive $1,000 plus one-half of the difference between the target and its expenditures.

80. The "0.2 children per unit" figure was derived from Downe, Multi-Family Housing Study Scituate Mass.(1972); for a more complex analysis reaching the same result see Dept. of Community Affairs, Scituate Town Report (1974).

81. Real Estate Research Corp., The Costs of Sprawl (U.S. Gov't Printing Office 1974).

82. Keene, What's the Next Step after Mt. Laurel, vol. 27 no. 6 Land Use and Zoning Digest 25 (1975).

83. For example, the tale of"... a foolish man, who built his house upon the sand: and the rain descended, and the floods came, and the wind blew and beat upon that house; and it fell and great was the fall of it" (Matt VII: 26-27).

84. M.G.L. Ch. 131 s. 40 The current law was created by a combination and amendment of the Hatch and Jones Acts in 1972. For a general

discussion of the prior Acts see Metropolitan Area Planning Council, vol. 4 Open Space and Recreation Program for Metropolitan Boston, pp. 42-52 (1969)

85. The protected land and water areas are:

> "any bank, beach, dune, flat, marsh, meadow or swamp bordering on the ocean or on any estuary, creek, river, stream, pond, or lake, or any land under said waters or any land subject to tidal action, coastal storm flowage, or flooding."

86. "If after said hearing the conservation commission, selectmen or mayor, as the case may be, determine that the area on which the proposed work is to be done is significant to public or private water supply, to the ground water supply, to flood control, to storm drainage prevention, to prevention of pollution, to protection of land containing shellfish, or to the protection of fisheries,

87. "Any person aggrieved by an order issued after such hearing, or any owner of land abutting the land upon which the proposed work is to be done, or any ten residents of the city or town where such land is located may (appeal)."

88. Dawson, Open Space and Recreation Plan for Metropolitan Boston -- Vol. 4. Open Space Law Supplement (1972).

89. M.G.L. Ch. 21 s. 17B (St. 1971 ch. 840).

90. M.G.L. Ch. 40 s. 2 (St. 1954 Ch. 368 x. 2).

91. 24 USC 1909 et seq.

92. See e.g., Paddock v. Brookline, 347 Mass 230 (1964).

93. Mass. Const., Art. of Amend. II, s. 1 (1966)

94. Id. s. 6.

95. By section 8 the following powers were reserved to the legislature: 1) regulation of elections, 2) assessment and collection of taxes, 3) borrowing or pledging credit, 4) disposal of park land, 5) enactment of private or civil law governing civil relationships except as incidental to the exercise of an independent municipal power, 6) enactment or punishment of felonies or imposition of imprisonment.

96. 1973 Mass. Adv. Sh. 291, 293 NE 2d 268 (establishments of a local human rights commission not pre-empted by existance of state commission).

97. Id.at 309, 310 fn. 16, 293 NE 2d at 281 fn 16

98. 1973 Mass Ad Sh 491, 294 NE 2d 393 (1973) (discussed supra notes 59-65 and accompaning text)

99. "... nor shall private property be taken for public use without just compensation"

100. Bosselman, The Taking Issue, pp. 99-104 (U.S. Gov't Printing Office 1973)

101. Id.at 85, 106

102. 123 U.S. 623 (1887)

103. Id.at 667

104. 260 U.S. 393 (1922)

105. Id.at 415, 416

106. Heyman, Innovative Land Regulation and Comprehensive Planning The New Zoning (Marcus and Groves ed) at 44-52 (1970)

107. Sax, Takings and the Police Power 74 Yale L. J. 36 (1964)

108. Heyman, supra, note 106 at 54.

109. Sax, Takings, Public Rights and Private Property 81 Yale L.J. 149 (1971)

110. Bosselman, supra, note 100 at 212-235

111. 349 Mass 104, 206 NE 2d 666 (1965); see also Ryckman, Evidence Necessary to Determine if a Regulation Restricting the use of Property is invalid as a Taking without Compensation, 6 Nat. Res. J. 8 (1966).

112. 349 Mass 104, 111-112, 206 NE 2d 66, 671-72

113. Foster, Comm'r of Natural Resources v.s. Volpe & Co., Finding, Ruling and Order of Horace T. Cahill, Judge, Suffolk Superior Court in Equity No. 82036, March 9, 1964.

114. 1972 Mass Ad Sh 1303, 284 NE 2d 891, cert. denied 409 U.S. 1108.

115. Id at 1314-15, 284 NE 2d at 899-900

116. Compare the Wisconsin Court's opinion in a similar shoreline zoning case, Just v. Marinette County 5 Wisc. 2d 7, 201 NW26 761 (1972):

> An owner of land has not absolute and unlimited right to change the essential natural character of his land so as to use it for a purpose for which it was unsuited in its natural state and which injures the rights of thers. The exercise of the police power in zoning must be reasonable and we think it is not an unreasonable exercise of that power to prevent harm to public rights by limiting the use of private property to its natural uses.

117. 1976 Mass Ad. Sh. 143 (MacGibbon III). The Duxbury litigation had a colorful history which stretched nearly two decades with three hearings before the Supreme Judicial Court, see also, MacGibbon v. Duxbury, 347 Mass 690 (1964) (Mac Gibbon I): MacGibbon v. Duxbury, 356 Mass 635 (1970) (Mac Gibbon II).

118. The Court's opinion on this point states:

> We accept the judge's finding that the board's denial of the permit was not solely to preserve the area in its natural state, but we think his conslusion that there are practical uses to which the property can be put misconceives the applicable standard. The possible uses found, for agriculture and recreation, do not appear to be "practical" in the sense used in MacGibbon II. As one of the board's experts testified, "the uses to which the property may be put include -- some of these may sound facetious, but they're not -- bird watching, hiking -- these are actual uses that people have, to make of such properties, similiar properties -- looking at the water, ...just simple pride of ownership, just to say that they own a piece of the salt marsh, flying model airplanes or kites, growing marsh hay, which at one time was a very strong use of the marsh, very prevalent use I should say, to protect the view.... Of course, one, obviously is conservation."
>
> We conclude that the preservation of the ocean food chain and other public benefits of the land in its natural state did not provide a legally tenable ground for denying the permit...

119. M.G.L. Ch. 40A s. 5

120. Opinion of the Justices, 234 Mass 597, 606 (1920)

121. American Law Institute, Model Land Development Code, Art 5 (Tentative Draft #4, April 25, 1972).

122. Constonis, Development Rights Transfer: Easing the Police Power -- Eminent Domain Deadlock, 26 Land Use and Zoning Digest 6 (1974); Chavooshian & Norman, Transfer of Development Rights, A New Concept in Land Use Management 32 Urban Land 11 (Dec. 1973); Charmichael, Transferable Development Rights as a Basis for Land Use Control 2 Fla St. U. L. Rev. 35 (1974); Constonis, Space Adrift -- Landmark Preservation and The Market Place (1974) Constonis, The Chicago Plan: Incentive Zoning and the Preservation of Urban Landmarks 85 Harv. L. Rev. 574 (1972); Constonis, Whichever Way You Slice it DRT is here to stay 40 Planning 10 (1974); Schlags, Who Pays for Transfer of Development Rights? 40 Planning 7 (1974) Note, the unconstitutionality of transferable development rights 84 Yale L. J. 1101 (1975)

123. M.G.L. Ch. 41 s. 81 Q (St 1953, c 674 s. 7)

124. See e.g. Smith v. Bd. of App. of Fall River, 319 Mass 341, 65 NE 2d 547 (1946): Clark v. Bd. of App. of Newbury 348 Mass 407, 204 NE 2d 434 (1965).

125. See e.g. Gricus V. Supt. & Insp. of Bldgs., 345 Mass 687, 189 NE 2d 209 (1963); Forenza v. Arlington, 349 Mass 428, 183 NE 2d 118 (1975)

126. Sylvania Electric Products Inc. v. Newton, 344 Mass 428, 183 NE 2d 118 (1962).

1. See Figure 1-9. Data for the South Shore region reveal similar characteristics. Of the 350,000 residents living in the 14 communities of the South Shore approximately 40,000 people or one-third of the work force commutes to Boston. Within this segment, the South Shore Chamber of Commerce estimates 17,000 people use some form of mass transit.

2. Level of service is a qualitative measure of operating conditions on a road. For a fuller discussion see Transportation Research Board Special Report 87, Highway Capacity Manual, 1965.

3. See Federal Register, Vol. 38, No. 215,(Nov. 8, 1973).

4. Wilbur Smith & Associates, An Access Oriented Parking Strategy for the Metropolitan Area, (Dept. of Public Works, p. 235, July 1974).

5. Patriot Ledger, (July 10, 1975, p. 1).

6. Wilbur Smith, supra n. 4

7. See generally, Curtis, F.A., An Examination of Land and Water Transportation Alternatives for Commuters South of Boston, Environmental Engineers Thesis (Dept. of Civil Engineering, M.I.T., Cambridge, Ma., 1976, in preparation).

8. Akiva, Ben, Structure of Passenger Travel Demand Models, Ph.D Thesis, (Dept. of Civil Engineering, M.I.T., Cambridge, Mass., 1973).

9. Atherton, T., Approaches for Transferring Disaggregated Travel Demand Models, M. Sc. Thesis, (Dept. of Civil Engineering, M.I.T., Cambridge, Ma., 1975).

1. Reprinted in full in an unpublished report on the Town of Cohasset by John Nolen, 1912, on file with the Nolen Memorial Collection at Rotch Library, M.I.T. Cambridge, Massachusetts

2. See generally, Our Nation and the Sea, (U.S. Printing Office 1969); Department of Natural Resources, Massachusetts Outdoor Recreation Plan, (State House Printing Office 1971)

3. Final Report of the Special Commission Established to Make an Investigation and Study Relative to the Management, Operation, and Accessibility of Public Beaches Along the Sea Coast and Other Related Matters p 9. (State House Printing Office 1975)

4. House No. 481. (Massachusetts General Court, 1974)

5. In Re Opinion of the Justices. 1974 Mass Ad. Sh. 1067, 313 NE 2d 561

6. Storer v. Freeman, 6 Mass 435 (1810)

7. The confiscation of wharves and warehouses as purpestures against the crown's title and the selling of shore privileges to others certainly angered wealthy littoral owners and appears to have played no small part in the Grand Remonstrance and subsequent beheading of King Charles. See, Parsons, Public and Private Rights in the Foreshore, 22 Col. L. Rev. 707, 711 (1922); Note, Water and Water Courses, 31 Mich. L. Rev. 1134 1136 n. 4 (1933)

8. Weston v. Sampson 62 Mass (8 Cush.) 347 (1851)

9. Anthony v. Gifford 84 Mass (2 Allen) 547 (1869)

10. 195 Mass 79, 80 NE 688 (1907). The court was strongly influenced by two English decisions that also refused to recognize a public right to bath: Blundell v. Caterall 5 B. & Ald 368, 106 Eng. Rep. 1190 (K.B. 1821) Brinkman v. Matley 2 Ch. 313 (1904)

11. The lower court's opinion is also reported in 195 Mass at 79-81

12. 195 Mass 79 at 83. See e.g. Attorney General v. Herrick, 190 Mass 307 (1905)

13. City of Long Beach v. Mansell, 3 Cal 3d 462, 493, 91 Cal Rptr 23, 45, 416 P. 2d 423, 445 (1970); see also Lefcoe, Land Development Law 113 (1974)

14. HR. 10394, S. 2691 93rd Congress, 1st Session. See also Eckhardt, A Rational National Policy on Public Use of the Beaches, 24 Syracuse L. Rev. 967 (1973); Black, Constiutionality of the Eckhardt Open Beaches Law 74 Colp. L. Rev. page 301 (1974)

15. Barney v. City of Keokuk, 94 U.S. 324, 338 (1876)

16. Final Report, supra n. 3 Appendix A

17. Ivons-Nispel, Inc. v. Lowe, 347 Mass 337 (1964)

18. Ibid.

19. See "Beach Access -- A Critical Issue for the South Shore" South Shore Mirror p. 16 (Wed., June 11. 1975); "Bill Seeks Beachland for Public" Boston Globe p. 25, 37 (Sun. June 29, 1975); "Beach Access -- There's Less of it Here Than Anywhere Else" The South of Boston Mirror Summer Magazine pp 10-13 (1975)

20. e.g. "Family Challenges Town Beach Claim" The Patriot Ledger p. 10 (on., June 16. 1975); "Board Insists Town owns T. St. Beach" The Patriot Ledger p 35 (Wed, June 18, 1975)

21. Massachusetts might consider the Swedish "Allemansratt" (All Man's Right) as an alternative. This right of way prerogative, which is based on ancient Swedish custom, gives every person a right to pass over land without the permission of the owner so long as it is done without causing appreciable material damage or disturbing the privacy of the home. See National Board of Urban Planning, Physical Planning in Sweden (Axel, Abrahamsons, Boktryckeri, Karskrona, 1972) pp 9-10. See also, Lefcoe, An Introduction to American Land Law 1GI 91974)

22. Metropolitan Area Planning Council, Open Space and Recreation Program for Metropolitan Boston (1969)

23. "Beach Parking Being Studied" The Patriot Ledger (June 6, 1975)

24. "Beach Parking Overseeing Backed" The Patriot Ledger (July 24, 1975)

25. M.G.L.A. ch 45 s.1.; Final Report, Supra. n. 3 at 62

26. See generally Note, The Public Trust in Tidal Areas: A Sometimes Submerged Traditional Doctrine, 79 Yale L.J. 762 (1969)

27. Borough of Neptune City v. Borough of Avon-by-the-City, 61 N.J. 296, 308-309, 294 A. 2d 47 (1972)

28. Gewirtz v. City of Long Beach, 69 Misc. 2d 763, 330 N.Y.S. 2d 495 Sup. Ct., Nassau Co. 1972)

29. Cf. Gould v. Greylock Reservation Commission, 350 Mass 410 (1966); see generally, Sax, The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention, 68 Mich. L. Rev. 475 (1969)

30. Final Report, supra. n. 3 at 69

31. M.G.L., ch 40 ss. 5 (clause 25A), 11A, 12B, 12C, 21

32. Burton v. Wilmington Parking Authority, 365, U.S. 715 (1961); Black, Foreword: "State Action," Equal Protection and California Proposition 14, 81 Harv. L. Rev. 69 (1967); Note, Access to Public Municipal Beaches: The Formation of a Comprehensive Legal Approach, 4 Suffolk L. Rev. 936 (1973)

33. Final Report, supra. n. 3 Appendix B

34. See, "Harbor Islands Development Urged" Patriot Ledger (Feb. 5, 1975)

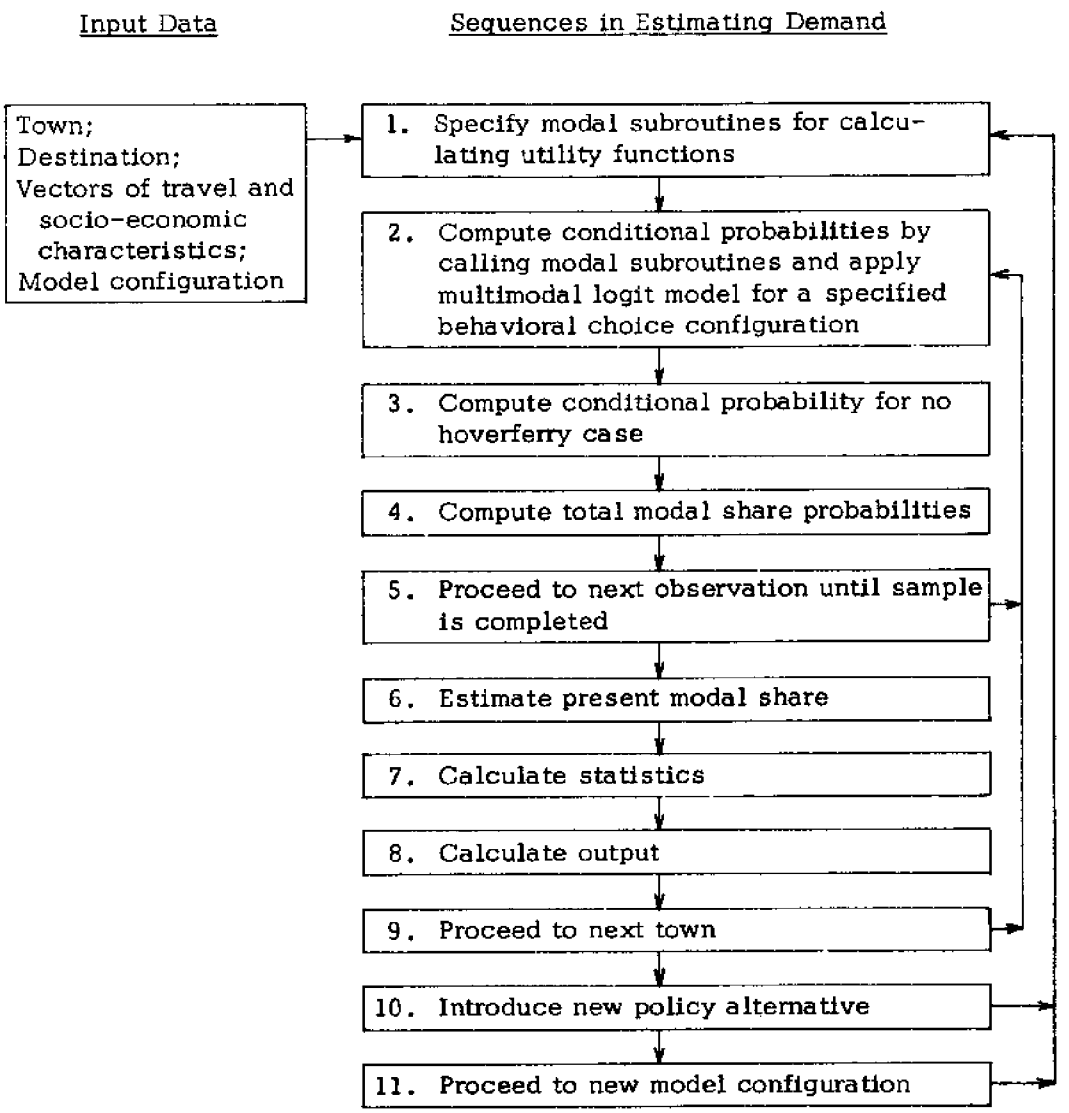
LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES

(Continued)

FLOW CHART OF THE DISAGGREGATED DEMAND MODEL APPLICATION TO PREDICT MODAL SHARE IN THE SOUTH SHORE



Note: See Figure 4-7, page 107, for graphic illustration

Along a 70-mile stretch of the Atlantic Ocean lie the Massachusetts communities of Hingham, Hull, Cohasset, and Scituate. Located in close proximity to Boston, these four towns have been greatly affected by the post World War II suburbanization. Between 1940 and 1970 their combined population more than tripled (growth of 202 percent), while the Metropolitan Boston area grew by a mere 17 percent. This rapid growth has drawn the coastal communities, somewhat reluctantly, into a dependent relationship with each other and the metropolitan region. Roughly two-thirds of the wage earners depend on employment outside their town. In a similar manner, the local residents rely on the region for most of their goods and services. In return, each town offers itself as an enjoyable place to live or vacation, although there is increasing pressure to stop or slow down the flow of newcomers.

The first waves of suburbanization have not been gentle. Residential development and the adjunctive needs of an increasing population have strained the local infrastructure of roads, schools, and municipal services and have greatly taxed the natural resource base. Recently, as property assessments rise and the last farms and forests stand on the verge of subdivision, there are anguished feelings that the character of these communities is being lost. While it may be true that in the past development has proceeded in a haphazard manner, based on myopic principles and carried out by fragmented planning authorities, the basic fact is that the vast majority of residents are satisfied with the existing quality of life. In fact, their main concern seems to be keeping their communities just the way they are. Most residents, however, realize that changes are inevitable and are reconciled to the fact that the same pressures that created the rapid suburbanization will continue to alter their communities.

This study is concerned with problems and conflicts resulting from growth, regionalization, and resource depletion in the coastal zone communities of Hingham, Hull, Cohasset, and Scituate.

Chapter 1 of this report is intended to acquaint the reader with the general characteristics of the study area. The South Shore's geography and history are briefly sketched, with an emphasis on the post World War II development trends. Basic demographic data are presented and the economic and natural resource bases detailed. Finally, the likelihood of continuing development pressure and the impact of other factors are examined in the context of population projections.

Chapters 2 through 5 address four major problem areas that have resulted from the rapid suburbanization: growth controls, waste-water facilities, transportation systems, and coastal recreation. The approach taken has been to identify the nature of the problem, assess the present situation in terms of technical, economic and legal issues, and make recommendations for improvement. We make no pretense of having studied each facet exhaustively or of offering unique solutions.

Chapter 6 presents a summary of specific recommendations. Our goal has been to outline critical issue areas and a number of policy alternatives that can be utilized by planners, legislators and citizens in formulating the Massachusetts Coastal Zone Management Plan and the State Land Use Policy Act.

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