

# MAINE STATE LEGISLATURE

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BRIDGES.  
Chebeague Is.

1958

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Prepared by:  
Maine State Highway Commission

In cooperation with:  
U. S. Bureau of Public Roads

MAR 05 1985

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# CHEBEAGUE ISLAND BRIDGE REPORT

## Introduction

The State Highway Commission has made a study of the economic and engineering aspects of a bridge connecting Littlejohn and Great Chebeague Islands in Casco Bay.

Great Chebeague, largest of the islands in Casco Bay is located 8.5 miles from Portland, 1.25 miles from Falmouth Foreside and 0.6 mile from Littlejohn Island. The area of the island is approximately 10 square miles. Year-round population is about 300 and summer residents number nearly 700.

The Resolve which follows indicates the scope of this report.

### Chapter 178 - Resolves

RESOLVE, Directing a Study Related to a Bridge to Chebeague Island.

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Study re bridge to Chebeague Island. Resolved: That the State Highway Commission be, and is, authorized and directed to study the engineering and economic aspects of a proposed bridge to Chebeague Island. Without intent to limit the scope of the study, the commission shall review such facts and conclusions as have been presented in the so-called Fay, Spofford, Thorndike report on this subject, which report was presented at the regular session of the 98th Legislature. They shall particularly concern themselves with any corrections they deem necessary in bringing up to current construction costs the cost estimates presented in the aforesaid report; similarly they shall bring up to date such interest costs as were used in arriving at certain basic conclusions in that report. The results of their study shall be reported to the next regular session of the Legislature along with such conclusions as the facts so developed may indicate to the end that the 99th Legislature may be reasonably informed on the question of whether or not a toll facility, so

established, may be expected to be self-liquidating. If the study concludes the facility will not be self-liquidating, the report shall indicate reasonable estimates of year by year subsidy required to operate and maintain the facility and to service such long term debt as may be required.

The study shall include the economic effect of the proposed bridge on the other islands in Casco Bay adjacent to Chebeague Island.

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Briefly the answers to these questions on the basis of analyses by the Planning and Traffic Division of the State Highway Department are summarized as follows:

1. Estimated construction costs of \$2,700,000 coincide with those estimated in the Fay, Spofford and Thorndike report.

2. The interest charges are estimated at 3 percent. (The Fay, Spofford and Thorndike report, published in November 1956, estimated the interest on a bond issue at 2.75 percent).

3. The bridge would not be self-liquidating. (The Fay, Spofford and Thorndike report indicated the bridge bonds could be redeemed in 50 years).

4. The total subsidy over a period of 50 years would amount to \$2,327,260. Table 2 in the appendix indicates that a subsidy would be necessary after the first year, continuing in reduced amounts until the 46th year. This subsidy would be necessary to operate and maintain the bridge and necessary causeways and to service a long-term debt. It should be noted that funds for this subsidy may have to be borrowed, but interest on this debt has not been included in the financial summation. (The Fay, Spofford and Thorndike report said no subsidy was needed).

5. It is not anticipated that the other islands in Casco Bay would be affected appreciably if the Chebeague Island Bridge were built and current

ferry service maintained. However, the Casco Bay Lines would face continuing operating deficits if deprived of Chebeague Island income and required by the Public Utilities Commission to continue service to Cliff Island which is located in the City of Portland on the seaward side of Chebeague Island. It is practically certain that the taxpayers in some governmental jurisdiction would have to make up the loss sustained by the ferry company to assure continued service to Cliff Island. Financial records of the Casco Bay Lines indicate an annual subsidy of \$25,000 to \$30,000 would be necessary.

### II. Basic Data

The information from which these conclusions are derived consists of data obtained by State Highway Commission personnel in a house-to-house survey\*; the financial records of the Casco Bay Lines and personal interviews with company officials; and a review of experience on other toll bridges connecting islands with the mainland principally at Deer Isle and Westport.

### III. Estimated Usage of Proposed Bridge

Usage of the proposed bridge is based upon trips presently being made both on the Casco Bay Lines' boats and by private boat as estimated by residents of Chebeague Island and from records of actual usage of Casco Bay Lines facilities as shown in the boat captains' daily reports. This data indicates 33,888 trips per year by Casco Bay Lines and 4,130 trips by private boat. In the determination of the number of trips which would be made on the Chebeague Bridge during the first year of operation, experience on the Deer Isle-Sedgwick Bridge was used. The experience on that bridge was used because it possesses similar characteristics as the proposed Chebeague Bridge, namely, it is a toll bridge connecting an island with the mainland; the bridge replaced a ferry; both Deer Isle and Chebeague have moderate year-round populations which are considerably increased

\* See Table 1 in appendix.

by the annual influx of summer residents.

The estimates of first year volume of traffic on the Chebeague Bridge are based on the following factors:

1. An average of 2.4 persons per vehicle. (Fay, Spofford and Thorndike used 2.5 persons per car).
2. Passenger cars comprise 75 percent of the total traffic volume.
3. Toll income from trucks is 37 percent greater than toll income from passenger cars.\*\*

Application of Deer Isle experience on truck travel to Chebeague Island may be to the advantage of Chebeague since Deer Isle has a granite quarry, a sardine factory, and a shipyard and industrial plants which generate considerable truck travel while Chebeague has no industries. Lobstering and seining are activities common to both islands.

Estimated usage of the Chebeague Island Bridge reflects the additional trips made in an area where the mainland is densely populated and likely to generate more trips. Sedgwick, the mainland town across the bridge from Deer Isle is a small community as compared with the municipalities on the mainland across from Chebeague. The nearest towns to Deer Isle comparable in size to Cumberland, Falmouth and Yarmouth, all within five or six miles of Chebeague by the proposed bridge, are Ellsworth and Bucksport both more than 25 miles distant.

The table below shows comparative population (year-round and summer), and first year trips, actual on Deer Isle and estimated at Chebeague:

	<u>Deer Isle-Stonington</u>	<u>Chebeague</u>
Residents:		
Year-round	2,795 <sup>/1</sup>	308
Summer	1,500 <sup>/1</sup>	660
Trips per year	41,450 <sup>/2</sup>	34,600

<sup>/1</sup> For year 1940.

<sup>/2</sup> Equivalent passenger cars, 1940.

\*\* This fact is used to convert trucks into equivalent passenger cars which facilitates financial computations.

#### IV. Future Usage

Analysis of the Deer Isle-Sedgwick Bridge operations shows that travel increased 56 percent during the first seven years of operation. It is the opinion of the Planning and Traffic Division that similar growth will occur on the proposed Chebeague Island Bridge and that growth thereafter will occur at a constant annual figure equivalent to 1.4 percent of the seventh year, or approximately 800 vehicles per year. Increases on the Deer Isle-Sedgwick Bridge were in excess of this amount but were judged to be due to periodic reductions in the tolls.

#### V. Future Growth of Chebeague Island

While some population growth may occur on Chebeague Island during the next 50 years, it is not anticipated that construction of a bridge will provide any significant impetus to this growth. The necessity of paying tolls in excess of \$700 per year for everyday travel will be a deterrent to use of Chebeague as a homesite by persons employed on the mainland. The possibility also exists that such gains in summer residence as may occur as a result of greater flexibility of travel deriving from construction of the bridge may be offset by removals from the island by summer residents who prefer the privacy which the island presently affords.

An example of the attitude of some island residents with regard to zoning is reflected in the restrictions affecting Chebeague Island in the proposed Cumberland zoning ordinance. These restrictions appear to be such as to limit any extensive development.

In summation, the State Highway Commission is of the opinion that the bridge would not be self-liquidating and that a subsidy of \$2,327,260 would be necessary to operate and maintain the bridge and necessary causeways and to service a long-term debt of \$2,700,000. The Commission also believes there would be an adverse effect on the other islands in Casco Bay unless current ferry service were continued to the other islands presently being served.



70°-15' W

70°-10' W

PLATE I

MAP FROM U. S. C. & G. S. CHART NO. 1204  
MONHEGAN ISLAND TO CAPE ELIZABETH

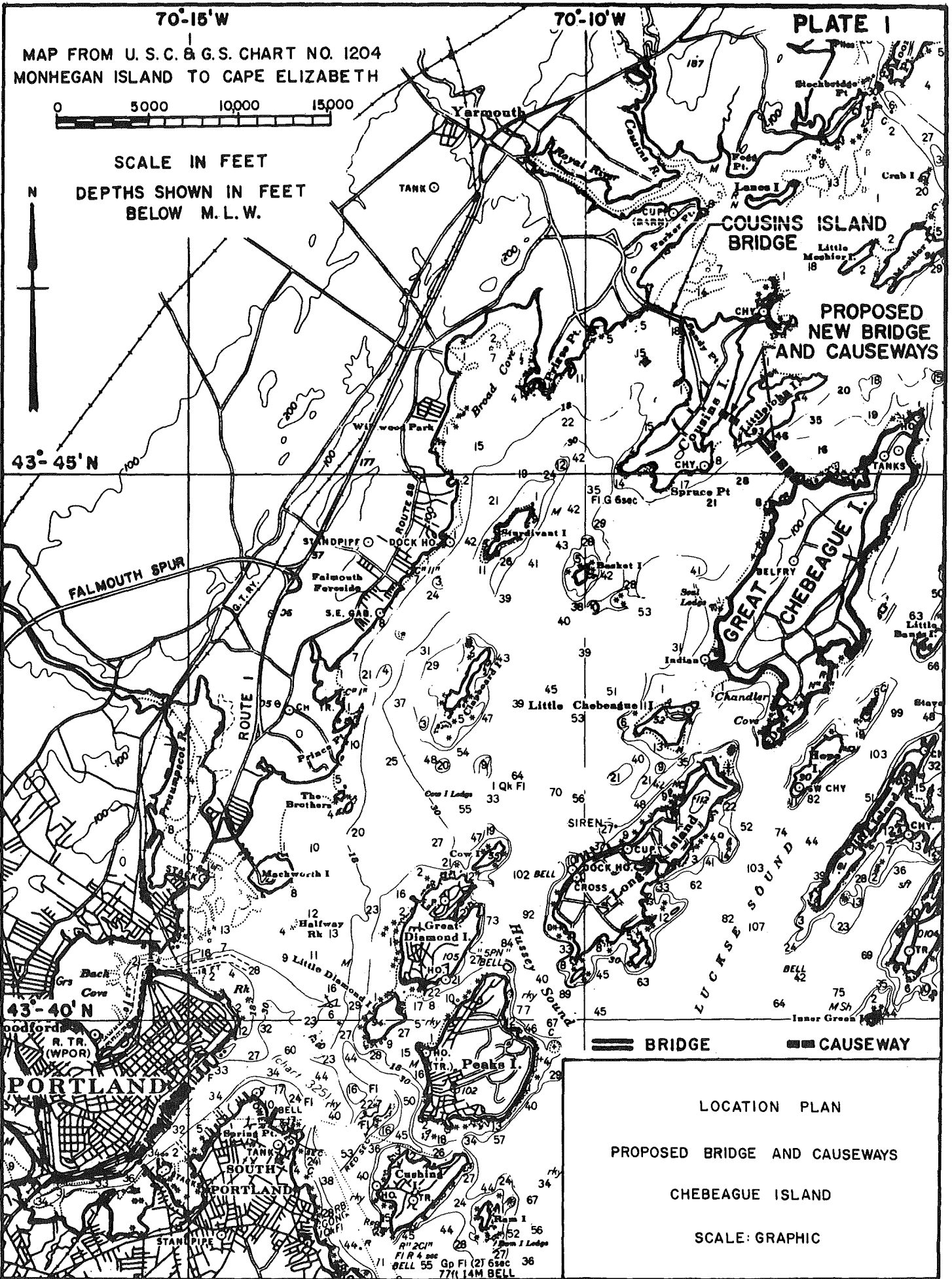


SCALE IN FEET

DEPTHS SHOWN IN FEET  
BELOW M. L. W.

N

43°-45' N



COUSINS ISLAND  
BRIDGE

PROPOSED  
NEW BRIDGE  
AND CAUSEWAYS

GREAT  
CHEBEAGUE I.

LUCKY SOUND

FALMOUTH SPUR

STANDPIPE

DOCK HO.

ROUTE I

ROUTE 2

43°-40' N

PORTLAND

SOUTH

PORTLAND

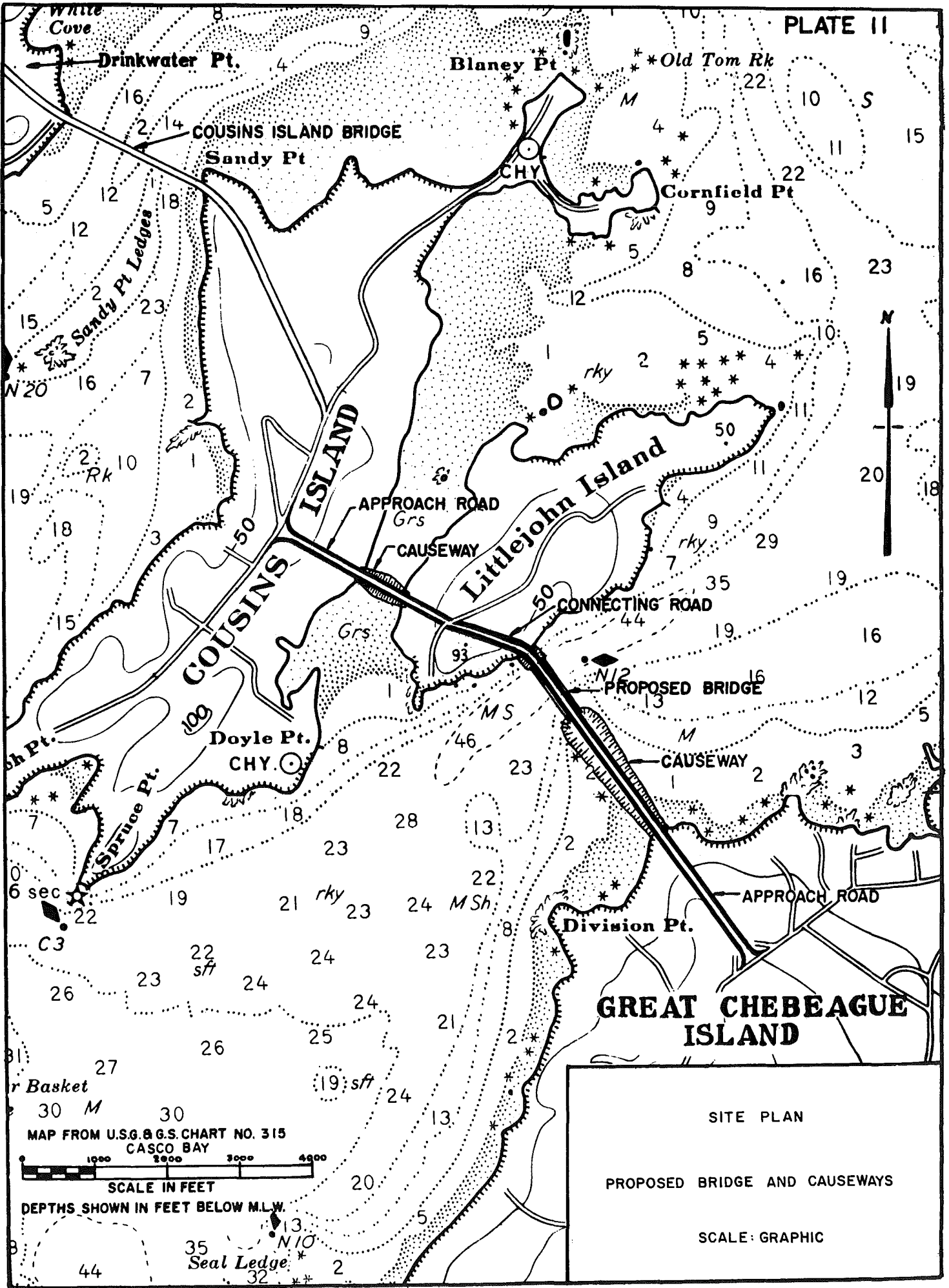
BRIDGE CAUSEWAY

LOCATION PLAN

PROPOSED BRIDGE AND CAUSEWAYS

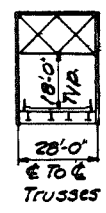
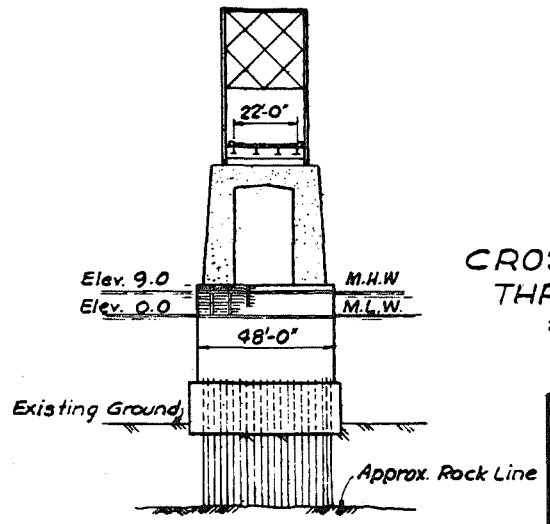
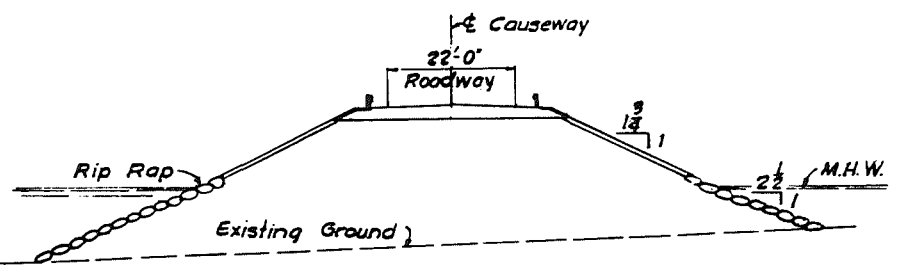
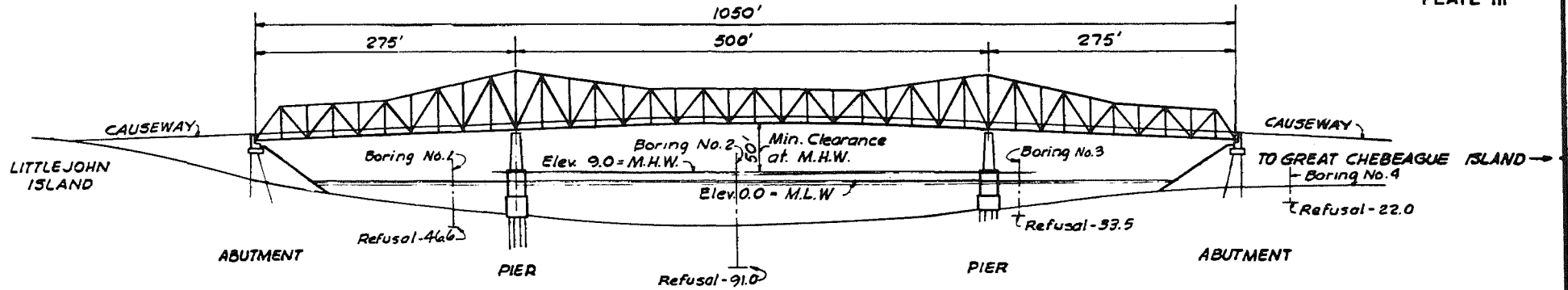
CHEBEAGUE ISLAND

SCALE: GRAPHIC



MAP FROM U.S.G.S. CHART NO. 315  
CASCO BAY  
SCALE IN FEET  
DEPTHS SHOWN IN FEET BELOW M.L.W.

SITE PLAN  
PROPOSED BRIDGE AND CAUSEWAYS  
SCALE: GRAPHIC










PROPOSED  
BRIDGE AND CAUSEWAYS  
ELEVATION AND DETAILS  
AS PRESENTED BY  
FAY, SPOFFORD & THORNDIKE, INC.  
BOSTON, MASS.  
SCALE: AS NOTED

# CHEBEAGUE ISLAND

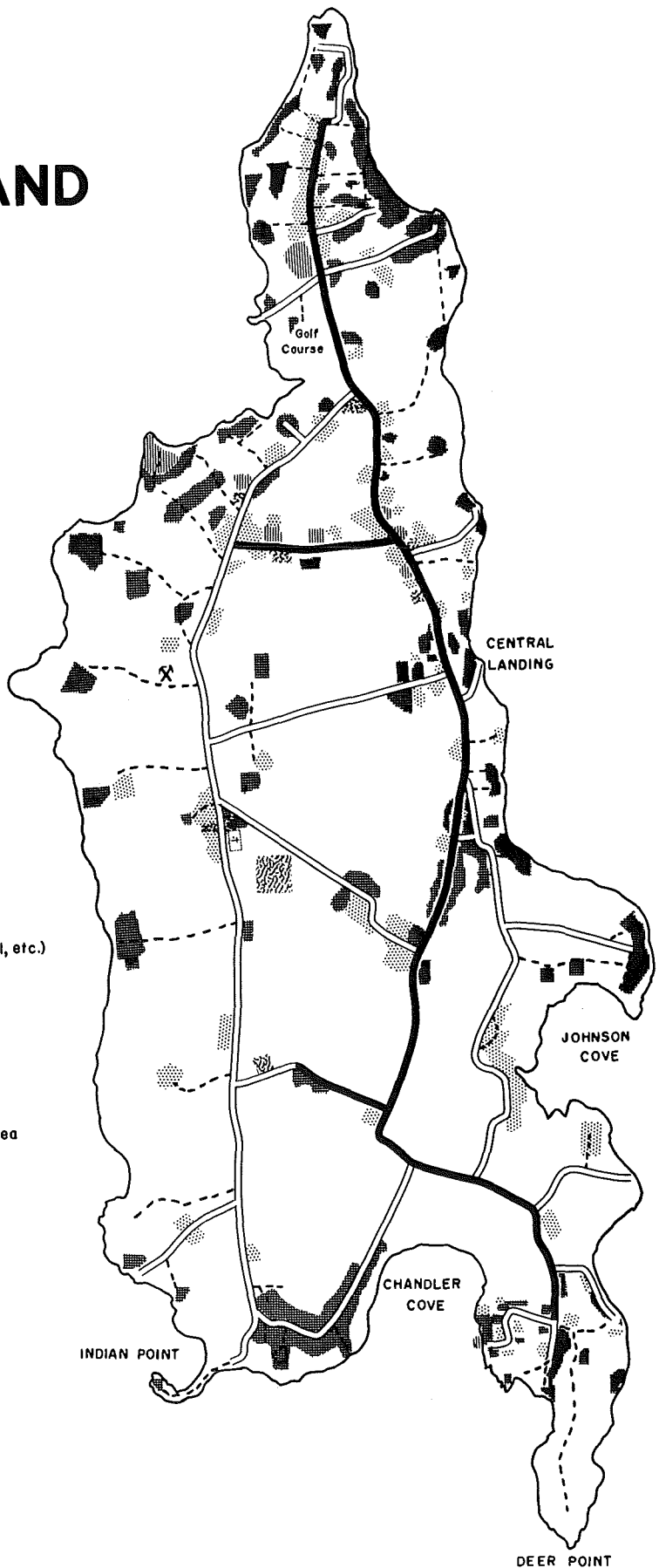
## LAND USE

### LEGEND

-  Summer Residence
-  Year-Round Residence
-  Business
-  Municipal (Church, School, etc.)
-  Gravel Pit
-  Cemetery
-  Potential Development Area

### ROADS

-  Paved
-  Dirt
-  Private

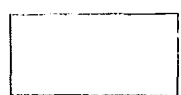


CHEBEAGUE ISLAND

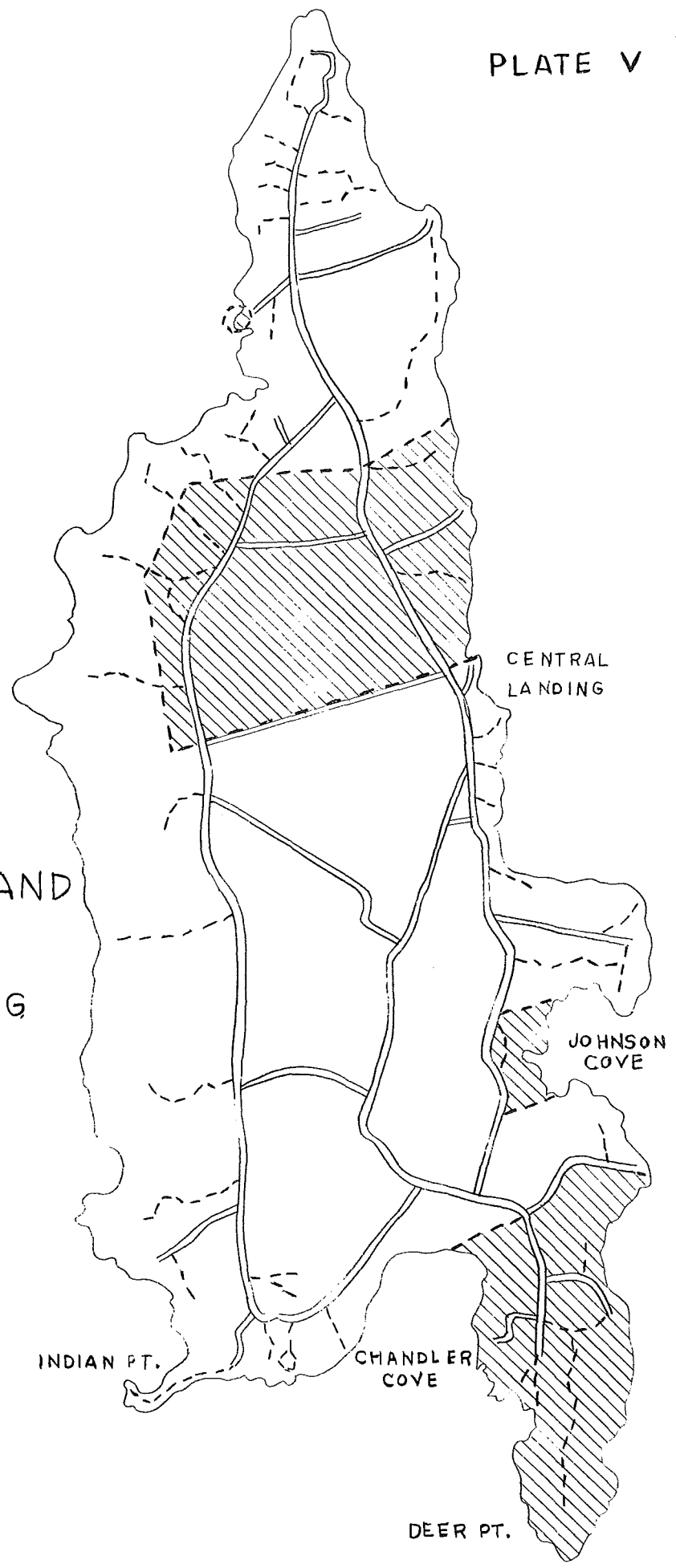
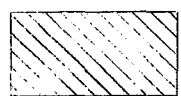
PROPOSED ZONING

Legend

Residential



Business



CHEBEAGUE ISLAND  
SURVEY DATA

	<u>Permanent Residents</u>			<u>Seasonal Residents</u>			<u>Hotels &amp; Summer Camps</u>
	<u>Information from Interviews</u>	<u>Information Obtained from Others or Estimated</u>	<u>Total</u>	<u>Information from Interviews</u>	<u>Information Obtained from Others or Estimated</u>	<u>Total</u>	<u>Information from Interviews</u>
Number of Dwellings	92	6	98	159	40	199	3
Number of Occupants	293	15	308	534	126	660	49
Number of Licensed Operators	59	3	62	239	56	295	
Number of Pass. Vehicles Owned	77	4	81	164	38	202	
Number of Comm. Vehicles Owned	<u>23</u>	<u>1</u>	<u>24</u>	<u>3</u>	<u>1</u>	<u>4</u>	
Total Vehicles Owned	100	5	105	167	39	206	
Number of One-Way Trips between Mainland per year via Casco Bay Lines:							
<u>Purpose</u>							
Work	3,796	195	3,991	1,096	256	1,352	
Recreation	3,354	171	3,525	1,558	365	1,923	
Business	12,238	678	12,916	4,876	1,143	6,019	
School	<u>3,354</u>	<u>171</u>	<u>3,525</u>	<u>0</u>	<u>0</u>	<u>0</u>	
Total Trips	22,742	1,215	23,957	7,530	1,764	9,294	1,200
Number of One-Way Trips between Mainland per year via Private Boats:							
<u>Purpose</u>							
Work	1,300	65	1,365	60	15	75	
Recreation	416	11	427	64	15	79	
Business	2,080	104	2,184	0	0	0	
School	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
Total Trips	3,796	180	3,976	124	30	154	0

CHEBEAGUE ISLAND  
SURVEY DATA  
SUMMARY

	Number of <u>Dwellings</u>	Number of <u>Occupants</u>	Number of Licensed <u>Operators</u>	Number of Vehicles Owned			Estimated Number of Trips between Mainland per Year		
				<u>Passenger</u>	<u>Commercial</u>	<u>Total</u>	<u>via Casco Bay Lines</u>	<u>via Private Boat</u>	<u>Total</u>
Permanent Residents	98	308	62	81	24	105	23,957	3,976	27,933
Seasonal Residents	199	660	295	202	4	206	9,294	154	9,448
Vacant Houses	<u>27</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Permanent & Seasonal	324	968	357	283	28	311	33,251	4,130	37,381
Hotels and Summer Camps	<u>3</u>	<u>49</u>					<u>1,200</u>	<u>0</u>	<u>1,200</u>
Total	327	1,017					34,451	4,130	38,581
Minus difference in estimated number of trips via Casco Bay Lines and actual number per Casco Bay Lines records for the year 1957								<u>- 563</u>	<u>- 563</u>
Total Adjusted One-Way Passenger Trips between Mainland per Year							<u>33,888</u>	<u>4,130</u>	<u>38,018</u>

CHEBEAGUE ISLAND  
PROPOSED TOLL BRIDGE  
CONSOLIDATED STATEMENT OF ESTIMATED REVENUES AND EXPENDITURES

Bond Year	Estimated Vehicles per year	Estimated Income Tolls or Bond Sale	Bonds Outstanding	Estimated Expenditures			Estimated Net Income	Bonds Redeemed	Amount Available	Yearly Subsidy Needed	Accumulative Subsidy
				Interest at 3%	Operational Costs	Total					
1	None	\$2,730,000*	\$2,700,000	\$ 81,000	\$1,200,000**	\$1,281,000	\$1,449,000	\$ None	\$1,449,000	\$ None	\$ None
2	None	None	2,700,000	81,000	1,500,000**	1,581,000	-1,581,000	None	-132,000	132,000	132,000
3	34,600	43,250#	2,700,000	81,000	23,000***	104,000	-60,750	56,250	-117,000	117,000	249,000
4	38,600	48,250	2,643,750	79,315	23,400	102,715	-54,465	56,250	-110,715	110,715	359,715
5	41,400	51,750	2,587,500	77,625	23,800	101,425	-49,675	56,250	-105,925	105,925	465,640
6	44,200	55,250	2,531,250	75,940	24,200	100,140	-44,890	56,250	-101,140	101,140	566,780
7	47,000	58,750	2,475,000	74,250	24,600	98,850	-40,100	56,250	-96,350	96,350	663,130
8	49,800	62,250	2,418,750	72,565	25,000	97,565	-35,315	56,250	-91,565	91,565	754,695
9	52,600	65,750	2,362,500	70,875	25,400	96,275	-30,525	56,250	-86,775	86,775	841,470
10	55,400	69,250	2,306,250	69,190	25,800	94,990	-25,740	56,250	-81,990	81,990	923,460
11	56,200	70,250	2,250,000	67,500	26,200	93,700	-23,450	56,250	-79,700	79,700	1,003,160
12	57,000	71,250	2,193,750	65,815	26,600	92,415	-21,165	56,250	-77,415	77,415	1,080,575
13	57,800	72,250	2,137,500	64,125	27,000	91,125	-18,875	56,250	-75,125	75,125	1,155,700
14	58,600	73,250	2,081,250	62,440	27,400	89,840	-16,590	56,250	-72,840	72,840	1,228,540
15	59,400	74,250	2,025,000	60,750	27,800	88,550	-14,300	56,250	-70,550	70,550	1,299,090
16	60,200	75,250	1,968,750	59,065	28,200	87,265	-12,015	56,250	-68,265	68,265	1,367,355
17	61,000	76,250	1,912,500	57,375	28,600	85,975	-9,725	56,250	-65,975	65,975	1,433,330
18	61,800	77,250	1,856,250	55,690	29,000	84,690	-7,440	56,250	-63,690	63,690	1,497,020
19	62,600	78,250	1,800,000	54,000	29,400	83,400	-5,150	56,250	-61,400	61,400	1,558,420
20	63,400	79,250	1,743,750	52,315	29,800	82,115	-2,865	56,250	-59,115	59,115	1,617,535
21	64,200	80,250	1,687,500	50,625	30,200	80,825	-575	56,250	-56,825	56,825	1,674,360
22	65,000	81,250	1,631,250	48,940	30,600	79,540	1,710	56,250	-54,540	54,540	1,728,900
23	65,800	82,250	1,575,000	47,250	31,000	78,250	4,000	56,250	-52,250	52,250	1,781,150
24	66,600	83,250	1,518,750	45,565	31,400	76,965	6,285	56,250	-49,965	49,965	1,831,115
25	67,400	84,250	1,462,500	43,875	31,800	75,675	8,575	56,250	-47,675	47,675	1,878,790
26	68,200	85,250	1,406,250	42,190	32,200	74,390	10,860	56,250	-45,390	45,390	1,924,180
27	69,000	86,250	1,350,000	40,500	32,600	73,100	13,150	56,250	-43,100	43,100	1,967,280
28	69,800	87,250	1,293,750	38,815	33,000	71,815	15,435	56,250	-40,815	40,815	2,008,095
29	70,600	88,250	1,237,500	37,125	33,400	70,525	17,725	56,250	-38,525	38,525	2,046,620
30	71,400	89,250	1,181,250	35,440	33,800	69,240	20,010	56,250	-36,240	36,240	2,082,860



CHEBEAGUE ISLAND  
PROPOSED TOLL BRIDGE  
CONSOLIDATED STATEMENT OF ESTIMATED REVENUES AND EXPENDITURES

Bond Year	Estimated Vehicles per year	Estimated Income Tolls or Bond Sale	Estimated Expenditures			Estimated Net Income	Bonds Redeemed	Amount Available	Yearly Subsidy Needed	Accumulative Subsidy	
			Bonds Outstanding	Interest at 3%	Operational Costs						Total
31	72,200	\$ 90,250	\$1,125,000	\$ 33,750	\$ 34,200	\$ 67,950	\$ 22,300	\$ 56,250	\$ -33,950	\$ 33,950	\$2,116,810
32	73,000	91,250	1,068,750	32,065	34,600	66,665	24,585	56,250	-31,665	31,665	2,148,475
33	73,800	92,250	1,012,500	30,375	35,000	65,375	26,875	56,250	-29,375	29,375	2,177,850
34	74,600	93,250	956,250	28,690	35,400	64,090	29,160	56,250	-27,090	27,090	2,204,940
35	75,400	94,250	900,000	27,000	35,800	62,800	31,450	56,250	-24,800	24,800	2,229,740
36	76,200	95,250	843,750	25,315	36,200	61,515	33,735	56,250	-22,515	22,515	2,252,255
37	77,000	96,250	787,500	23,625	36,600	60,225	36,025	56,250	-20,225	20,225	2,272,480
38	77,800	97,250	731,250	21,940	37,000	58,940	38,310	56,250	-17,940	17,940	2,290,420
39	78,600	98,250	675,000	20,250	37,400	57,650	40,600	56,250	-15,650	15,650	2,306,070
40	79,400	99,250	618,750	18,565	37,800	56,365	42,885	56,250	-13,365	13,365	2,319,435
41	80,200	100,250	562,500	16,875	38,200	55,075	45,175	56,250	-11,075	11,075	2,330,510
42	81,000	101,250	506,250	15,190	38,600	53,790	47,460	56,250	-8,790	8,790	2,339,300
43	81,800	102,250	450,000	13,500	39,000	52,500	49,750	56,250	-6,500	6,500	2,345,800
44	82,600	103,250	393,750	11,815	39,400	51,215	52,035	56,250	-4,215	4,215	2,350,015
45	83,400	104,250	337,500	10,125	39,800	49,925	54,325	56,250	-1,925	1,925	2,351,940
46	84,200	105,250	281,250	8,440	40,200	48,640	56,610	56,250	360	None	2,351,580
47	85,000	106,250	225,000	6,750	40,600	47,350	58,900	56,250	2,650	None	2,348,930
48	85,800	107,250	168,750	5,065	41,000	46,065	61,185	56,250	4,935	None	2,343,995
49	86,600	108,250	112,500	3,375	41,400	44,775	63,475	56,250	7,225	None	2,336,770
50	87,400	109,250	56,250	1,690	41,800	43,490	65,760	56,250	9,510	None	2,327,260
		<u>\$6,774,500</u>		<u>\$2,146,560</u>	<u>\$4,255,200</u>	<u>\$6,401,760</u>	<u>\$372,740</u>	<u>\$2,700,000</u>			<u>\$2,327,260</u>

\* Includes \$2,700,000 bond sale and \$30,000 reinvestment proceeds.

\*\* Construction costs.

\*\*\* Includes toll collection, summer and winter maintenance and annual reserve for painting or other maintenance, which occurs at intervals. \$23,000 is estimated for the first year with an annual increase of \$400.

# Toll Rate \$1.25 per vehicle.

The State Highway Commission expresses its appreciation to the following individuals and agencies for their cooperation in providing information essential to this report:

Cumberland Planning Board

Casco Bay Lines

Greater Portland Regional Planning Board

Chebeague Island Bridge Committee

Residents of Chebeague Island

Fay, Spofford and Thorndike, Inc., Boston, Mass.