

MAINE STATE LEGISLATURE

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FERRIS

Maine

MAINE STATE FERRY SERVICE



TRAFFIC OPERATIONS AND VESSEL NEEDS STUDY

SUMMARY REPORT

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1979

PREPARED FOR
MAINE DEPARTMENT
OF TRANSPORTATION

BY
FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS
BOSTON

FEBRUARY 1979

**MAINE STATE FERRY SERVICE
TRAFFIC OPERATIONS
AND
VESSEL NEEDS STUDY**

Prepared For The

MAINE DEPARTMENT OF TRANSPORTATION

**MR. ROGER L. MALLAR
COMMISSIONER OF TRANSPORTATION**



BY

**FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS BOSTON**

FEBRUARY 1979

FOREWORD

The Maine Department of Transportation directed Fay, Spofford & Thorndike, Inc. in October 1978 to perform a detailed traffic operations and vessel needs study of the scheduled services provided by the Maine State Ferry Service in Penobscot Bay. This summary report is a condensation of the Final Report prepared for that study. Existing and anticipated future ridership on the five routes operated by the Ferry Service has been analyzed, and needed improvements to vessels, terminals, and schedules have been identified. A recommended improvement program has been proposed for implementation by the Ferry Service between 1979 and 1990 to meet the identified needs on the various routes. Additional information concerning this study may be obtained from the Maine Department of Transportation, Transportation Services Division.

ACKNOWLEDGEMENT

Sincere appreciation is extended to the various island Boards of Selectmen and the following members of the Ferry Service Advisory Board, who so freely gave of their time and efforts to this study:

David B. Benson, Southwest Harbor	Thomas B. A. Godfrey, Vinalhaven
James S. Brown, North Haven	Ronald W. Green, Rockland
Michael S. Durkee, Islesboro	Capt. Gilbert Hall, Camden
James D. Gillespie, Atlantic	David L. Lunt, Frenchboro

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Roger L. Mallar	Commissioner
Richard A. Luettich	Deputy Commissioner
Daniel Webster, Jr.	Deputy Commissioner
William F. Fernald	Director, Transportation Services Division
Capt. Richard Spear	Manager, Maine State Ferry Service
William Avery	Business Manager

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STUDY PURPOSE

The Maine State Ferry Service (Maine Department of Transportation) provides scheduled ferry operations between the mainland and five islands in Penobscot Bay. These routes, shown in Figure 1, are the following:

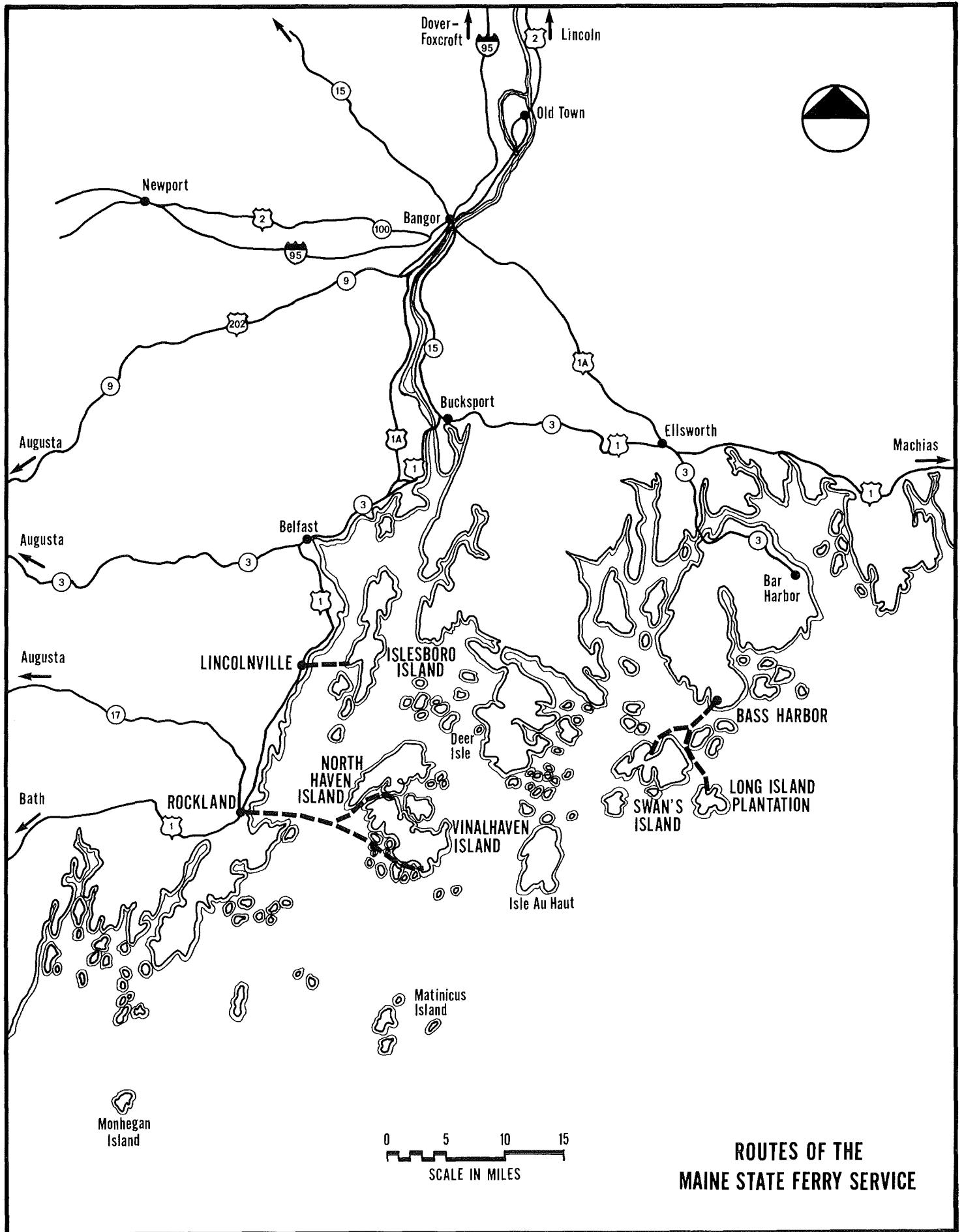
- (1) Rockland to Vinalhaven
- (2) Rockland to North Haven
- (3) Lincolnville to Islesboro
- (4) Bass Harbor to Swan's Island
- (5) Bass Harbor to Long Island Plantation

Five vessels are currently in service, four of which were built and placed in operation in 1959-1960, and the fifth of which was built and placed in operation in 1968.

A 1972-1973 Maine Department of Transportation (MDOT) study, entitled "Ferry Service and Terminal Facilities Requirements--An Analysis," identified that by the late 1970's and early 1980's consideration would have to be given to providing additional operational capacity on almost all routes because of the ridership demands placed on the service both by passengers and vehicles. These demands are especially severe during the peak summer season, and have resulted in inconvenience, delays, and unmet needs not only on the part of the year-round residents, but also on the part of commercial users, seasonal island residents, and tourists.

This traffic operations and vessel needs study represents an updated, more indepth analysis of the improvement needs of the Ferry Service first identified in the 1972-1973 study. Its purpose has been to develop an implementable program of needed service improvements which would accommodate, on a route-by-route basis, anticipated passenger and vehicular ridership demands through 1990. In proceeding toward this objective of development of a recommended program of Ferry Service improvements, the study has had to address a number of questions and concerns, including the following:

- (1) What will future trends in passenger and vehicular ridership be on each route?
- (2) How adequate are existing vessel assignments and schedules in servicing existing and potential future ridership demands?
- (3) What are the views and feelings of the users of the Ferry Service, especially the year-round island residents, regarding improvements in service?
- (4) In what condition are the present vessels, especially the four oldest vessels, which date back to 1959-1960? What is their remaining service life, and can improvements be made to them to prolong their lives and increase their carrying capacity?
- (5) What are the costs of replacement vessels and the tradeoffs between replacing existing vessels or maintaining and even improving the existing vessels?



**ROUTES OF THE
MAINE STATE FERRY SERVICE**

Figure 1

- (6) Are improvements to the terminals necessary to accommodate improvements in service?
- (7) What should the schedule of implementation be for the needed improvements?
- (8) How much would the improvements cost, and how would they be financed?

This summary report presents in capsule form the major study findings, conclusions, and recommendations contained in a several hundred page final report. It is the result of an intensive and cooperative work effort which brought together MDOT staff, the Ferry Service Advisory Board, Municipal Officials, and the islanders themselves through public meetings, to guide and assist the Consultant in development of a recommended improvement program which would serve the purposes and needs of all these interests.

EXISTING SERVICE

Table 1 summarizes the major characteristics of the present services provided on the five routes operated by the Maine State Ferry Service.

Route mileage varies from 3 miles on the Lincolnville-Islesboro route to 15 miles on the Rockland-Vinalhaven route. One-way trip times are commensurate with route mileages, varying from 25 minutes on the Lincolnville-Islesboro route to 1 hour, 25 minutes on the Rockland-Vinalhaven route.

Schedules vary by season on most routes, and in all cases are confined to daylight operation. Schedules also vary on each route between Monday-through-Saturday service and Sunday service, with fewer trips scheduled on Sundays. With the exception of the Bass Harbor-Long Island Plantation route, which has two round trips weekly throughout the year, the longest routes, Rockland to Vinalhaven and Rockland to North Haven, have the fewest scheduled trips: three round trips during the summer months and two round trips during the winter months. The shortest route, Lincolnville to Islesboro, has the most scheduled trips: nine round trips during the summer months and four round trips during the winter months.

The Maine State Ferry Service has a detailed tariff which enumerates fares for various categories of passengers (primarily by age) and vehicles (primarily by type and weight). Representative fares for automobiles (which include the driver) and adult passengers are contained in Table 1. They vary, not unexpectedly, by route mileage.

The vessels "North Haven," Governor Muskie," "Everett Libby," and "William S. Silsby," have been in service since 1959-1960, while the "Governor Curtis" has been in operation since 1968. The "Governor Muskie," which serves the highest-volume route, Lincolnville to Islesboro, has the largest vehicle capacity, at 24 autos. It also is the only non-standard vessel in operation on the Ferry Service, being primarily a harbor ferry and of broader beam and different hull shape than the other four vessels. These features make it suited only for use on the Lincolnville-Islesboro route. The

TABLE 1

CHARACTERISTICS OF MAINE STATE FERRY SERVICE ROUTES

<u>CHARACTERISTIC</u>	<u>ROCKLAND- VINALHAVEN</u>	<u>ROCKLAND- NORTH HAVEN</u>	<u>LINCOLNVILLE- ISLESBORO</u>	<u>BASS HARBOR- SWAN'S ISLAND</u>	<u>BASS HARBOR- LONG ISLAND PL.</u>
Route Mileage	15 Mi.	12.5 Mi.	3 Mi.	6 Mi.	8.5 Mi.
One-Way Trip Time	1H-25M	1H-10M	25M	40M	1H
Daily Round Trips (Mon.-Sat.)					
. Summer	3	3	9	6	2/week
. Winter	2	2	4	4	2/week
Automobile Fares					
. One-Way	\$ 7.85	\$ 7.85	\$2.45	\$4.20	\$5.45
. Round-Trip	\$12.95	\$12.95	\$3.60	\$6.95	\$8.75
Adult Passenger Fares					
. One-Way	\$ 1.95	\$ 1.95	\$0.60	\$1.05	\$1.35
. Round-Trip	\$ 2.95	\$ 2.95	\$0.95	\$1.60	\$2.05
Assigned Vessel ¹	Governor Curtis	North Haven	Governor Muskie	Everett Libby	Everett Libby
. Auto Capacity	17	9	24	12	12
. Enclosed Seated Passenger Capacity	62	26	25	50	50
. Maximum Passenger Capacity	175	125	125	175	175
1977 Ridership					
. Vehicles	17,259	7,985	47,309	18,327	790
. Passengers	65,001	30,815	117,573	50,711	2,215
% Revenues to Costs: 1977					
. Total Costs	74%	37%	39%	33%	38%
. Operating Costs	86%	42%	46%	39%	40%

¹Spare vessel is "William S. Silsby," with identical capacity as "North Haven."

newest vessel, the "Governor Curtis," has a vehicle capacity of 17 autos, second to the "Muskie," and serves Vinalhaven. The "Libby," "North Haven," and "Silsby" have significantly lower vehicle capacities. Enclosed seating (cabin) passenger capacities vary from 25 on the "Muskie" to 62 on the "Curtis." Maximum (Coast Guard rated) passenger capacities vary between 125 and 175.

In 1977, yearly ridership varied from a high of 47,309 vehicles and 117,573 passengers on the Lincolnville-Islesboro route to a low of 790 vehicles and 2,215 passengers on the Bass Harbor-Long Island Plantation route. The Lincolnville-Islesboro route is by far the heaviest volume route operated by the Ferry Service, by a factor of approximately twice its nearest counterparts, the Rockland-Vinalhaven and Bass Harbor-Swan's Island routes.

On a systemwide basis, the Ferry Service has never met costs of providing the service through the farebox. Revenues have varied from 70 percent of total system costs in fiscal year 1962-1963 to 46 percent in fiscal year 1977-1978. On the average, revenues have approximated 58 percent of total system costs during this period. Yearly deficits have been fully covered by annual State General Fund appropriations and surpluses from previous years. Annual appropriations have approximated yearly revenues for all but a few years between 1962 and 1977, and have varied from a low of \$187,400 in fiscal year 1962-1963 to a high of \$577,300 in fiscal year 1976-1977. The Rockland-Vinalhaven route has come closest to paying for itself through the farebox of all five routes. In 1977, revenues from this route covered 86 percent of direct route operating costs and 74 percent of total route costs, which include a prorated share of the general administrative costs and bond retirement costs of the Ferry Service. The Lincolnville-Islesboro route, which came next closest to paying for itself, covered 46 percent of its direct route operating costs and 39 percent of its total route costs, respectively.

PUBLIC VIEWS ON SERVICE PROVIDED

Public meetings on each island, meetings with island selectmen, and meetings with the Ferry Service Advisory Board were held as part of this study. Also available were the results of two questionnaire surveys conducted in 1975, one by the Maine Department of Transportation and the other by an ad hoc Vinalhaven Ferry Committee. The major views of ferry users with regard to present and future service can be summarized as follows:

General. Year-round island residents would like to see reductions in advanced reservation times, reduced fares for high-volume users of the service, more flexible scheduling, and improved parking conditions and security at both island and mainland terminals. They would also like replacement vessels to be wider and have more powerful propulsion systems than the present vessels. General consensus also exists that neither improved parking and parking security nor potential public ground transportation at the terminals will substantially reduce their vehicle usage on the Ferry Service, as by far the most frequent islander trips to the mainland are to stock up on groceries and supplies, which require the convenience of their vehicles to readily transport these purchases.

Rockland-Vinalhaven Route. Vinalhaven residents do not want a larger vessel than the "Governor Curtis" serving their island. Island residents and businessmen alike would like to see special (night) trips for commercial vehicles. Some interest exists also for joint Vinalhaven-North Haven trips and a new terminal on the north side of the island (opposite North Haven), but only as a second terminal, not a substitute, for the present terminal at Carver's Harbor.

Rockland-North Haven Route. Like Vinalhaven residents, North Haven residents do not want a larger vessel than the "North Haven." They would also like to see special trips (not necessarily at night) for commercial vehicles and vehicles left on the mainland, and expressed only limited interest in a ferry linkage between North Haven and Vinalhaven.

Lincolntonville-Islesboro Route. Islesboro residents desire a replacement vessel which has more vehicle capacity and is more seaworthy than the "Muskie." They would also like to see extra trips scheduled when a smaller vessel is temporarily assigned to their route. Other considerations include extending the summer schedule, a weekly/biweekly evening trip, a 9 A.M. trip to the mainland year round, a space tariff rather than weight tariff on vehicles, and an expanded enclosed passenger waiting area at Lincolntonville.

Bass Harbor-Swan's Island Route. Swan's Island residents desire that any replacement vessel be of greater vehicle capacity than the "Everett Libby." They would also like to see extra trips scheduled when a smaller vessel is temporarily assigned to the route, extended afternoon operation during the spring, and a "next day" preferential policy for vehicles left behind on the mainland.

Bass Harbor-Long Island Plantation. Long Island Plantation residents would like a second round trip on one of the two days of the week that a present single scheduled round trip is provided, for convenience (i.e., "same-day return") reasons.

PRESENT AND FUTURE IMPROVEMENT NEEDS

As indicated in Table 2, yearly vehicle and passenger ridership is expected to increase substantially on all routes between 1977 and 1990, which, on several routes will aggravate service deficiencies that already exist. Vehicle ridership increases are expected to vary between 44 percent and 77 percent during this 13-year period, with the Lincolntonville-Islesboro route continuing to be the highest volume route, followed by Bass Harbor-Swan's Island and Rockland-Vinalhaven. Passenger ridership increases are expected to vary between 20 percent and 58 percent, with the Lincolntonville-Islesboro route continuing to be the highest volume route.

The implications of present and anticipated future ridership levels on the quantity and quality of service provided is most severe with regard to available and needed vehicular route capacity, especially during peak (seasonal) periods. Vehicle route capacity utilization, that is, the percent of available vehicle route capacity which is being consumed by actual vehicle route volumes, is especially high on all routes during the months of July and August. It was particularly high on the Rockland-Vinalhaven and Rockland-North Haven routes in 1977, averaging 83 percent and 80 percent,

TABLE 2

MAINE STATE FERRY SERVICE RIDERSHIP TRENDS AND
SERVICE DEFICIENCIES IMPLICATIONS

<u>CHARACTERISTIC</u>	<u>ROCKLAND- VINALHAVEN</u>	<u>ROCKLAND- NORTH HAVEN</u>	<u>LINCOLNVILLE- ISLESBORO</u>	<u>BASS HARBOR- SWAN'S ISLAND</u>	<u>BASS HARBOR- LONG ISLAND PL.</u>
1990 Vehicle Ridership					
. Vehicles	25,700	12,200	68,800	26,400	1,400
. % Inc,77-90	49%	53%	45%	44%	77%
1990 Passenger Ridership					
. Passengers	81,000	41,000	174,000	61,000	3,500
. % Inc,77-90	25%	33%	48%	20%	58%
Peak Monthly Vehicle Route Capacity Utilization ¹					
. 1977	83%	80%	65%	73%	30%
. 1990	120%	122%	90%	101%	62%
No. Months Vehicle Route Capacity Utilization Exceeds 75% ¹					
. 1977	3	1	0	0	0
. 1990	10	9	5	6	0
% Trips Vehicles Left Behind: Peak Month, 1977					
	40%	19%	19%	21%	-
Peak Monthly Seated Passenger Capacity Utilization ¹					
. 1977	77%	86%	63%	38%	20%
. 1990	95%	110%	91%	44%	34%
Peak Monthly Maximum Passenger Capacity Utilization ¹					
. 1977	43%	30%	37%	16%	9%
. 1990	52%	39%	53%	19%	14%

¹Regularly assigned vessel.

respectively, of monthly capacity. The Bass Harbor-Long Island Plantation route, in contrast, averaged only 30 percent vehicle route capacity utilization during the peak month. On a trip-by-trip basis, several scheduled trips on the four major routes (excluding the Long Island Plantation route) operated at capacity (100 percent utilization) during the peak month, resulting in vehicles being left behind at a terminal because they could not be accommodated. Vehicles were left behind on as much as 40 percent of scheduled trips during the peak month on the Rockland-Vinalhaven route, with the other three major routes falling in the 19 percent-21 percent range. Peak monthly vehicle route capacity utilization will be severely high on all four major routes by 1990, if present vessels and schedules are maintained. Travelers' desires to travel on the Rockland-Vinalhaven, Rockland-North Haven, and Bass Harbor-Swan's Island routes will actually exceed available route capacity throughout the entire peak month (utilization exceeds 100 percent), and will approach capacity (90 percent) on the Lincolnville-Islesboro route. On a trip-by-trip basis during this month, the implications are quite clear: severe inconvenience and delays, and even unmet trips. Using 75 percent vehicle capacity utilization as a threshold criterion for (average) monthly utilization beyond which inconvenience, delays, and, unmet trips will become unacceptable to the user, not just one peak month, but several peak months become a problem on all four major routes. The Rockland-Vinalhaven route is most severe in this regard, with monthly vehicle route capacity utilization exceeding 75 percent three months of the year in 1977, and increasing to 10 months of the year in 1990. The Rockland-North Haven route will also have severe vehicle route capacity problems, at least nine months of the year by 1990.

Seated passenger route capacity utilization was high on several routes in 1977 and will be more significant on these same routes in 1990, even exceeding route capacity during the month of August on the North Haven route (110 percent). However, only during the summer months, when enclosed seated comfort is not as major a factor as other periods of the year, will passenger demands exceed the 75 percent threshold value for acceptable level of service. Maximum (Coast Guard rated) passenger utilization will not be a problem on any route through 1990.

ALTERNATIVE IMPROVEMENT OPTIONS

Four basic options were evaluated, singly and in combination, to provide needed service improvements to each route where capacity deficiencies were identified:

- (1) Present vessels with increased trip frequencies over present scheduled trips.
- (2) Larger vessels with present scheduled trip frequencies.
- (3) Larger vessels with increased trip frequencies over present scheduled trips.

- (4) Use of the spare vessel to provide additional trips in combination with (1), (2), or (3) above to meet peak seasonal demands.

All options were evaluated on a year-by-year basis between 1977 and 1990 relative to their satisfaction of the beforementioned threshold criterion of 75 percent route capacity utilization as an acceptable level of service improvement.

With regard to larger vessels, one issue which had to be first resolved was the feasibility and cost-effectiveness of enlarging the present vessels to increase vehicle capacity versus purchasing new replacement vessels of similar capacity. An intensive condition survey of the physical integrity of the present vessels by a certified marine surveyor resulted in the major study conclusion that, with proper maintenance, the remaining service life of all five vessels is at least 20 years. Subsequent analysis by this study's naval architect of the feasibility of enlarging four of the present vessels (excepting the "Governor Muskie") to gain additional vehicle and passenger capacity revealed that all four could both be feasibly and cost-effectively enlarged. That is, for the same size vessel, additional capacity could be gained less expensively via existing vessel enlargement than through purchase of a new vessel. For example the cost to enlarge the "North Haven" by 40 feet to accommodate 17 autos is \$806,600 (1978 prices), including a separate passenger upper deck, a more powerful propulsion system, and a bow thruster. The cost for a comparable new 17-auto replacement vessel is approximately \$2,300,000. The "Muskie" was considered for replacement, not for enlargement, because of its non-standard design.

Up to thirty variations of the four basic options listed above were evaluated for specific routes for 1977, 1985, and 1990, before arriving at a recommended plan of improvements to each route between 1979 and 1990 which could be integrated with similar plans for improvements to the other routes, and an overall Ferry Service improvement program and implementation strategy.

RECOMMENDED IMPROVEMENT PROGRAM

General Description

The recommended program of improvements to the service provided by the Maine State Ferry Service to meet identified traffic needs is summarized in Table 3. This program incorporates the following considerations:

- (1) Vessel requirements and trip frequency requirements necessary to effect the desired service improvements.
- (2) Condition and service lives of existing vessels.
- (3) Feasibility of modifying and enlarging existing vessels.
- (4) Cost implications of new replacement vessels.

- (5) Inputs from island residents and ferry users.

The improvements in the implementation plan outlined in Table 3 are the minimum changes required to accommodate future ridership at acceptable levels of service while maintaining efficient utilization of vessels and crews.

The improvements and implementation strategy reflect several key premises. First is the conclusion that the "Governor Muskie" must be replaced by a new vessel before 1990. Ridership forecasts justify the conclusion that additional vehicle capacity is needed on the Lincolnville-Islesboro route. The vessel is the only non-standard vessel of the Ferry Service, with no flexibility as to use at other terminals, and it is not practical or desirable to enlarge or modify it to do so. Second is the conclusion that the other four vessels of the Ferry Service can be enlarged or modified to gain additional vehicle capacity, and it has been proven that it is more cost-effective to gain added vehicle capacity in this manner than to purchase new replacement vessels.

The third and perhaps most important premise is that the new replacement vessel for the Lincolnville-Islesboro route be put in operation as early in the program period as feasible, and that needed enlargements of the present vessels follow on a year-by-year basis, rather than precede this purchase. In this manner, more flexibility is permitted for the Ferry Service to temporarily reassign its vessels to various routes when one of the present vessels is out of operation for modifications. Also, the Ferry Service will always have a spare vessel as today, for special trips, emergencies, extra trips, drydocking and maintenance periods, etc., although the "spare vessel" will be assigned to scheduled trips for several months each year.

The fourth premise is that the consensus viewpoint of North Haven and Vinalhaven residents, expressed at the island public meetings, selectmen's meetings, and Ferry Service Advisory Board meetings--namely, to not have larger vessels serving their islands--be respected to the extent practicable. The recommended program contains service improvements to these routes which minimize vessel enlargements by expanding present trip schedules, including utilization of the spare vessel to provide scheduled service during peak periods of the year.

Program Discussion

Referring to Table 3, the main feature of the first three years of the improvement program (1979, 1980, and 1981) is that all of the existing vessels would remain in service on their normally assigned routes. However, the "Silsby," now used exclusively as a spare vessel during the summer months, would be required to provide one daily round trip between Rockland and Vinalhaven between June and September in 1979 and 1980, and one daily round trip in June, two daily round trips in July and August, and one daily round trip in September in 1981. As an additional crew would be required to operate the "Silsby's" trips to Vinalhaven between June and September, and one daily round trip to North Haven would be required in July and August, efficient utilization of the full (i.e., 8-hour) workday of the crew in June and September suggests that the additional trip to North Haven also be provided during these two months, though not required for demand reasons.

1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	YEAR		
1 R.T. MODIFIED "SILSBY" APR., MAY, JUNE, SEPT. 2 R.T. MODIFIED "SILSBY" JULY, AUGUST			1 R.T. MOD. "SILSBY" APR. - SEPT.	1 R.T. MODIFIED "SILSBY" (17-AUTO CAPACITY) JUNE - SEPTEMBER			1 R.T. "LIBBY" MAY, JUNE, SEPTEMBER 2 R.T. "LIBBY" JULY, AUG.	1 R.T. "LIBBY" JUNE, SEPT. 2 R.T. "LIBBY" JULY, AUG.	1 R.T. "SILSBY" JUNE, SEPT. 2 R.T. "SILSBY" JULY, AUG.	1 R.T. "SILSBY" JUNE - SEPTEMBER			ROCKLAND - VINALHAVEN	
PERMANENTLY ASSIGN MODIFIED (0' EXTENSION) "CURTIS" (19 - AUTO CAPACITY) WITH PRESENT SCHEDULES							TEMP. ASSIGN MOD. "SILSBY" (17 AUTOS) PRESENT SCHEDULES							
							CONSTRUCT 0' EXTEN. TO "CURTIS" (19 - AUTOS)	DESIGN 0' EXTEN. TO "CURTIS" (19 - AUTOS)						
OPERATE MODIFIED "CURTIS" (19 - AUTO CAPACITY) 3 DAILY ROUND TRIPS DURING OCTOBER - NOVEMBER							OPERATE MOD. "SILSBY" (17 AUTOS) 3 R.T. OCT. - NOV.	OPERATE "CURTIS" 3 DAILY ROUND TRIPS DURING OCTOBER - NOVEMBER (MDOT: PURSUE LIGHTED CHANNEL BUOYS WITH COAST GUARD)						
1 DAILY ROUND TRIP MODIFIED "SILSBY" APRIL - SEPTEMBER			1 DAILY ROUND TRIP MODIFIED "SILSBY" (17 AUTO CAPACITY) JUNE - SEPTEMBER			1 R.T. "LIBBY" MAY - SEPT.	1 R.T. "LIBBY" JUNE - SEPT.	1 DAILY ROUND TRIP "SILSBY" JUNE - SEPTEMBER					ROCKLAND - NORTH HAVEN	
PERMANENTLY ASSIGN MODIFIED (0' EXTENSION) "LIBBY" (14-AUTO CAPACITY) WITH PRESENT SCHEDULES				TEMP. ASSIGN MODIFIED "N. HAVEN" PRESENT SCHEDULES	TEMP. ASSIGN "LIBBY" PRESENT SCHEDULES			OPERATE "NORTH HAVEN" 3 R.T. DURING MAY						
				CONSTRUCT 40' EXTEN. TO "NORTH HAVEN" (17-AUTOS)	DESIGN 40' EXTEN. TO "NORTH HAVEN" (17 AUTOS)									
PERMANENTLY ASSIGN NEW 30-AUTO FERRY WITH PRESENT SCHEDULES				1 ADDITIONAL DAILY ROUND TRIP "MUSKIE": JULY - AUGUST					CONSTRUCT NEW 30-AUTO FERRY	DESIGN NEW 30-AUTO FERRY				LINCOLNVILLE - ISLESBORO
				CONSTRUCT LINC./ISLES. TERMINAL MODIF.	DESIGN LINC./ISLES. TERMINAL MODIF.									
								1 ADDITIONAL R.T. "LIBBY" JULY - AUGUST					BASS HARBOR - SWAN'S ISLAND	
PERMANENTLY ASSIGN MODIFIED (40' EXTENSION) "NORTH HAVEN" (17-AUTO CAPACITY) WITH PRESENT SCHEDULES				TEMPORARILY ASSIGN NEW 30 - AUTO VESSEL WITH PRESENT SCHEDULES										
				CONSTRUCT 0' EXTEN. TO "LIBBY" (14-AUTOS)	DESIGN 0' EXTEN. TO "LIBBY" (14 -AUTOS)									
MAINTAIN PRESENT SCHEDULES WITH ASSIGNED SWAN'S ISLAND VESSELS												BASS HARBOR - LONG ISLAND PLANTATION		
CONSIDER ADDING SECOND DAILY ROUND TRIP ONE DAY PER WEEK														
MODIFIED "SILSBY" (17-AUTO CAPACITY) (ALSO PROVIDES EXTRA TRIPS TO VINALHAVEN AND NORTH HAVEN)							"LIBBY" (ALSO PROVIDES EXTRA TRIPS TO VINALHAVEN AND NORTH HAVEN		"SILSBY" (ALSO PROVIDES EXTRA TRIPS TO VINALHAVEN AND NORTH HAVEN)				SPARE VESSEL	
							CONSTRUCT 40' EXTEN. TO "SILSBY" (17-AUTOS)	DESIGN 40' EXTEN. TO "SILSBY" (17-AUTOS)						

R. T. = DAILY ROUND TRIP

TABLE 3
RECOMMENDED FERRY SERVICE
IMPROVEMENT PROGRAM
AND IMPLEMENTATION PLAN

Starting in 1980, the "Curtis" would also have to provide three round-trips daily through October and November. During the month of November, especially the latter half of the month, this scheduling would present a potential problem in that daily service would terminate at Vinalhaven after dark (approximately 6 P.M., if the summer schedule is followed). Darkness is a problem, particularly on the Vinalhaven route, because of the narrow, winding, and rock-lined channel which must be negotiated at the entrance to Carver's harbor. It is recommended that because of these late scheduled trips appear to be necessary, and also since emergency and special trips do occur to and from the island after sunset, that MDOT pursue the possibility of having lighted buoys installed as channel markers by the Coast Guard.

Scheduling improvements are also recommended for the Swan's Island route in 1980 and 1981. The "Libby" would be required to make an additional daily round trip per day during July and August. This extra trip could be accommodated by the "Libby" utilizing the existing crews within the limits of their present working hours.

Another important and critical feature of the first three years of the program is that in 1980, design of a new 30-auto ferry to be used ultimately on the Islesboro route, should be performed, followed by its construction in 1981. While this vessel would be eventually assigned to the Lincolnville-Islesboro route in 1986, its early construction is critical in order that it can provide needed service and capacity while existing vessels are being modified. Modifications to present vessels require that they be put out of service during the time the changes are being made. Design for modification and enlargement of the "Silsby" by 40 feet, including a passenger upper deck, which increases its auto capacity to 17, would occur in 1981.

In 1982 the new 30-auto ferry would be temporarily assigned to the Swan's Island route, and the "Libby" would be assigned as the spare vessel, while the "Silsby" was out of service and being modified and enlarged by 40 feet into a 17-auto ferry according to the design prepared in 1981. The new vessel would operate on the present Swan's Island schedules, including providing the two round trips weekly to Long Island Plantation. The previous additional round trip by the "Libby" during the months of July and August would no longer be required with the 30-auto ferry, and could be dropped.

On the Vinalhaven route in 1982, the Curtis would continue to provide service with present schedules, plus extension of the summer schedule to provide three round trips daily through October and November. The "Libby" would become the spare vessel, and would provide, as in 1981, an additional round trip to Vinalhaven during June and September and two additional round trips during July and August. On the North Haven route, the "North Haven" would operate on present schedules, with the exception that its summer schedule, three round trips daily, would need to be extended back through the entire month of May. The "Libby" would also continue one daily round trip to North Haven between June and September, concurrent with the additional service it would be providing to Vinalhaven.

Also in 1982, the design for modification of the "Curtis" to bring it up to 19-autos capacity (but requiring no extension in length, just modifications to provide passenger accommodations on an upper level), would be prepared.

The year 1983 would see the modified (17-auto) "Silsby" temporarily assigned to the Vinalhaven route while the "Curtis" was being modified. The three round trips daily during October and November would be continued by the "Silsby". The spare vessel, still the "Libby," would continue to provide one to two additional round trips to Vinalhaven between June and September, and would also provide an additional round trip in May. The "Libby" would also provide an additional round trip to North Haven between May and September, permitting the extra May trip by the "North Haven" to be dropped. Design for a 40-foot extension to the "North Haven," which would result in an upper level passenger deck and a capacity of 17 autos, would also be performed in 1983.

An additional round trip per day during July and August would be required by the "Muskie" beginning in 1983 on the Islesboro route. This additional round trip could be accommodated within the present operating schedule of the "Muskie" and working hours of the crew.

In 1984, the modified (19-auto) "Curtis" would return to its permanent assignment on the Vinalhaven route. It would continue to operate on present schedules plus would provide three round trips daily through October and November. The modified (17-auto) "Silsby" would begin its permanent assignment as spare vessel in 1984, including providing an additional round trip daily each to Vinalhaven and North Haven between June and September. The additional May trips to each island and second Vinalhaven trips during July and August could be dropped. The "Libby" would be assigned to the North Haven route in 1984 while the "North Haven" was being enlarged (by 40-feet) and modified to include a second-level passenger deck and capacity of 17-autos. Design should also be underway in 1984 for modifications to the "Libby" (no length extension, but construction of passenger upper deck) to accommodate 14 autos, and for modifications to the Lincolnville and Islesboro Terminals (ferry berth and aprons) to accommodate the 30-auto ferry which would be assigned to that route in 1986. The additional "Muskie" round trip during July and August would also continue to be provided. The 30-auto ferry would continue its service on present schedules on the Swan's Island route in 1984.

In 1985, scheduled services would be the same as in 1984. However, the modified (17-autos) "North Haven" temporarily would replace the "Libby" on the North Haven route, while the "Libby" was modified to accommodate 14 autos and a new passenger upper deck. Also during 1985, the modifications to the Lincolnville and Islesboro terminals to accommodate the new 30-auto ferry would be constructed.

In 1986, permanent route assignment of all the vessels would be completed. That is, the modified "Curtis" would be on the Vinalhaven route, the modified "Libby" on the North Haven route, the new 30-auto ferry on the Islesboro route and the modified "North Haven" on the Swan's Island/Long Island Plantation route. The "Muskie" could then be removed from service,

and alternatively, sold, salvaged, converted to a lighter, used as a spare, etc. This report does not recommend that a specific course of action be decided at this time relative to the disposition of the "Muskie," as it is not necessary to the recommended program. In 1986, one daily round trip by the modified "Silsby" would still be provided between June and September on the Vinalhaven and North Haven routes. The third daily round trip by the modified "Curtis" through October and November would also be continued on the Vinalhaven route. The additional round trip during the months of July and August on the Islesboro route would no longer be necessary with permanent assignment of the 30-auto ferry, and has been dropped. No additional trips would also be necessary on the Swan's Island route with permanent assignment of the modified (17-auto) "North Haven" to that route. Suggested for further consideration by MDOT, however, is a second round trip to Long Island Plantation on one of the two days each week that Long Island Plantation receives service. This second trip is not required for traffic reasons, but was requested by Long Island Plantation's representative on the Ferry Service Advisory Board at one of the meetings held during this study, for the convenience of the island's inhabitants. It could be provided, as a substitute for a trip to Swan's Island, without seriously degrading service to Swan's Island, because of the modified "North Haven's" 17-auto capacity.

For 1987 to 1990, operations would be identical to those just described for 1986, with the exception that the additional round trips to Vinalhaven and North Haven during peak periods by the spare vessel, the modified (17-auto) "Silsby," must be expanded. This expansion of scheduled trips would be necessary to meet Vinalhaven's traffic requirements, and as indicated previously, has been extended to North Haven so that efficient utilization of the vessel and additional crew would result. This expansion would include providing one additional round trip to each island in April and May, starting in 1987, and a second additional round trip to Vinalhaven in July and August, starting in 1988.

In summary, the recommended improvement program has been developed to ensure that each route served by the Maine State Ferry Service would continue to receive an acceptable level of service in the future. Recommendations have been made for the purchase of a new 30-auto ferry (which should be of standard design), for 40-foot extensions to the two smallest vessels operated by the Ferry Service, and for modifications to all existing ferries with the exception of the "Muskie," to improve their passenger comfort, vehicle capacity, and maneuverability (see subsequent discussions). The recommended program has attempted to strike a balance between the desires of the islanders themselves, as expressed at the public meetings, and the need to practically provide increased service to meet projected demands. While there would be, by necessity, rather frequent shuffling of the various vessels among the routes during the early stages of the program, and while other alternative programs were considered, these improvements do offer a logical schedule of implementation that would meet the needs of the Ferry Service and its users through 1990.

Table 4 represents the recommended schedule for vessel modifications, replacements, and assignments. Brief comments on the final vessel assignments are in order. Islesboro and Swan's Island would have permanently assigned to their routes, by 1986, larger capacity vessels which the

TABLE 4

RECOMMENDED VESSEL MODIFICATION/REPLACEMENT/ASSIGNMENT SCHEDULE

- 1980 (1) Perform design for a new 30-auto ferry (6-9 months).
- 1981 (1) Construct a new 30-auto ferry (6-9 months).
 (2) Perform design for 40-foot extension of "Silsby" to 17-auto capacity, including an upper passenger deck (6 months).
- 1982 (1) New 30-auto ferry temporarily assigned to Swan's Island route.
 (2) Construct modified "Silsby" (40-foot extension) with 17-auto capacity, including an upper passenger deck (6 months).
 (3) Perform design for 0-foot extension of "Curtis" to 19-auto capacity, including an upper passenger deck (6 months).
 (4) Temporarily assign "Libby" as spare vessel.
- 1983 (1) Modified (17-auto) "Silsby" temporarily assigned to Vinalhaven route.
 (2) Construct modified "Curtis" (0-foot extension) with 19-auto capacity, including an upper passenger deck (6 months).
 (3) Perform design for 40-foot extension of "North Haven" to 17-auto capacity, including an upper passenger deck (6 months).
- 1984 (1) Modified (19-auto) "Curtis" permanently assigned to Vinalhaven route.
 (2) Modified (17-auto) "Silsby" permanently assigned as spare vessel.
 (3) Temporarily assign "Libby" to North Haven route.
 (4) Construct modified "North Haven" (40-foot extension) with 17-auto capacity, including an upper passenger deck (6 months).
 (5) Perform design for 0-foot extension of "Libby" to 14-auto capacity, including an upper passenger deck (6 months).
- 1985 (1) Modified (17-auto) "North Haven" temporarily assigned to North Haven route.
 (2) Construct modified "Libby" (0-foot extension) with 14-auto capacity, including an upper passenger deck (6 months).
- 1986 (1) Permanently assign modified (14-auto) "Libby" to North Haven route.
 (2) Permanently assign modified (17-auto) "North Haven" to Swan's Island route.
 (3) Permanently assign new 30-auto ferry to Islesboro route.
 (4) Remove "Muskie" from service.

island residents expressed a desire for during the 1978 island meetings. Islesboro's vehicle capacity would increase from 24-autos to 30-autos per trip; Swan's Island's would increase from 12 autos to 17 autos. Vinalhaven and North Haven would also have permanently assigned to their routes by 1986, larger capacity vessels, an improvement which residents of both islands expressed a desire not to have at the 1978 public meetings. However, these vessel size increases have been kept to the minimum required to effect the required service improvement through scheduling of additional trips by these vessels and the spare vessel during peak periods. No physical length extension is proposed for the "Governor Curtis," only modification to its superstructure to remove passenger accommodations from the main deck and replace them with improved amenities and capacity on a second level. This enables the "Curtis's" vehicular capacity to be increased from 17 autos to 19 autos. The "Libby," with similar modifications (no length extension, but with a passenger upper deck), has been recommended for North Haven service, which would increase the route's vehicular capacity from 9-autos to 14-autos per trip. Proof of these needs is the additional round trips per day by the spare vessel required to both islands during the spring and summer months, and the necessity of the "Curtis" to operate on its summer schedule through November to meet estimated ridership demands on these two routes through 1990. To not recommend for at least these minimum vessel modifications/extensions to increase vehicle capacity on both routes would result in extremely serious, and it is suggested, completely unacceptable, service problems on both routes.

This recommended program attempts to reasonably respond to the concerns of the islands (Vinalhaven and North Haven) relative to the sizes of new or modified vessels which may serve their routes in the future. In order to do this, it appears that the "spare" vessel would be required to make a number of extra trips to both Vinalhaven and North Haven during several months of the year that would not have been necessary had larger vessels than those contained in the recommended program been proposed to provide the base service to these islands. Accordingly, it must be recognized that if the spare vessel is required elsewhere during those months as a result of a breakdown, a drydocking, or for some other emergency or special use, such service to both Vinalhaven and North Haven would be adversely affected for the duration of the spare vessel's absence from the scheduled service.

At the public meetings and meetings with the Ferry Service Advisory Board, interest was expressed in a so-called "truck boat," particularly for Vinalhaven. As envisioned, this boat would be restricted to trucks only. This study has not made any specific recommendations with regard to the institution of a truck boat because the recommended program of improvements provides sufficient capacity for projected traffic to be accommodated on a mixed auto/truck basis using the scheduled vessels. But there is no reason why, if desired, one or more scheduled trips, in Vinalhaven's case, by either the regularly assigned vessel or the spare vessel during peak periods could not be used exclusively to transport commercial vehicles. If there indeed is demand for such service, operating details should be worked out between the Ferry Service management and the interested parties. The question arises though, why such a trip is necessary if sufficient space exists on scheduled trips to accommodate commercial vehicles. Also, what policy would be followed for truck trips which were not full? Should

non-commercial vehicles be permitted to board, and if so, how would the non-commercial users be informed in advance of such vacancies? If a truck boat is operated, should trucks be banned from all other trips?

Also during the course of this study, it was suggested that either the "Muskie" or a new lighter could be used as a truck boat. Costs to suitably modify the "Muskie" or to construct a new lighter were estimated. These vessels, however, especially the "Muskie," are generally still more suitable for service in sheltered waters rather than the open water crossing between Rockland and Vinalhaven/North Haven. Thus, scheduled trips by these vessels would be subject to cancellation due to adverse wind and weather conditions. Such scheduling inconsistency could be critical to the business operations of the "truck boat" users to the extent that this lack of dependability might detract from its use. An additional consideration is that the operation of the "Muskie" or a new lighter would add one more vessel to the fleet along with associated operating and maintenance costs where, in fact, its operation is not required.

No recommendation has also been made concerning a second terminal on the north side of Vinalhaven in the Fox Island Thoroughfare. The cost for a standard design facility (site preparation costs, slip, and transfer bridge) is estimated at \$1.11 million, based on 1978 prices. A minimum design facility would cost approximately \$659,000.

The possibility that MDOT may in the near future be required to provide scheduled service to Matinicus also came to light during the course of this study. Such service is presently being provided by a private operator. While recommendations regarding Matinicus service by MDOT were beyond the scope of this study, several comments are appropriate. Presently, only the two smallest vessels operated by the Ferry Service, the "North Haven" and the "Silsby," can physically dock at Matinicus; the harbor there precludes vessels of larger size from readily maneuvering within its confines, and vessels can only load and unload at half tide, since there is no transfer bridge. Accordingly, should MDOT be required to provide service, a number of options could be considered. One would be for MDOT to purchase, charter, or lease a new vessel somewhat larger than that presently used by the private operator for use on that route. Another possibility, depending upon when and if MDOT was required itself to operate the service, would be to cancel the modification/enlargement of the "North Haven" into a 17-auto ferry and, instead, leave it as is for service to Matinicus. Of course, this would necessitate the construction of a second new vessel for Swan's Island/Long Island Plantation service. A new 17-auto ferry is estimated to cost \$2.3 million in 1978 prices.

Improvement Costs

Table 5 presents costs for the vessel replacement/modification program. All costs presented in this section are 1978 costs, unless otherwise noted. Estimated are both engineering and construction costs. The major vessel improvement in Table 5 is the new 30-auto capacity vessel that would eventually be used as a replacement for the "Governor Muskie." It has a total cost of \$3,335,900 (1978 prices) and is also characterized by a length of 157 feet, a speed of 12.5 knots, and the ability to carry 210 passengers seated.

TABLE 5

VESSEL REPLACEMENT/MODIFICATION COSTS (1978 PRICES)

<u>Vessel</u>	<u>Specifications</u>	<u>Engineering Cost¹</u>	<u>Construction Cost</u>	<u>Total Cost</u>
New Replacement Vessel	Length: 157 feet Beam: 44 feet Draft: 7 feet Speed: 12.5 knots Capacity: 30 autos 210 Passengers (seated)	\$100,000	\$3,235,900	\$3,335,900
Governor Curtis	Length Extension: 0 feet Overall Length: 130 feet Add new superstructure Add bow thruster Add new engine (12.5 knots) Capacity: 19 autos 140 passengers (seated)	25,000	595,200	620,200
Everett Libby	Length Extension: 0 feet Overall Length: 110 feet Add new superstructure Add extended guard (3 feet) Add bow thruster Add new engine (12.5 knots) Capacity: 14 autos 56 passengers (seated)	25,000	495,900	520,900
North Haven	Length Extension: 40 feet Overall Length: 130 feet Add new superstructure Add extended guard (3 feet) Add bow thruster Add new engine (12.5 knots) Capacity: 17 autos 112 passengers (seated)	50,000	756,600	806,600
William S. Silsby	Length Extension: 40 feet Overall Length: 130 feet Add new superstructure Add extended guard (3 feet) Add bow thruster Add new engine (12.5 knots) Capacity: 17 autos 112 passengers (seated)	50,000	756,600	806,600
Total Cost		\$250,000	\$5,840,200	\$6,090,200

¹Design and inspection.

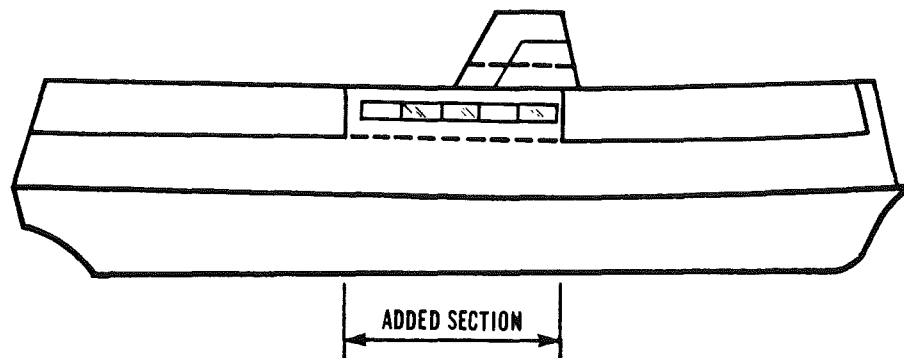
The remaining improvements in Table 5 all concern modifications to existing vessels. The "Curtis" would not be lengthened, but would otherwise be modified to increase vehicular and seated passenger capacity and maneuverability. The modifications would cost \$620,200. When completed, the ship would accommodate 19 autos and 140 passengers seated. The vessel would have a second-level passenger deck and, in addition, new, more powerful engines for increased maneuverability and speed. A bow thruster would also be installed to improve maneuverability.

The "Everett Libby" would also be modified, but not lengthened, and its capacity increased to 14 autos and 56 passengers seated. Like the "Curtis" it would be provided with new engines and a bow thruster. A second-level passenger deck would also be included, and its main (vehicle) deck would be widened. The total cost of these improvements to the "Libby" would be \$520,900.

The "North Haven" and the "William S. Silsby" would both be lengthened by 40 feet, increasing their vehicular capacity to 17 automobiles and seated passenger capacity to 112 on a new second-level deck. The total cost of improvements to each vessel, including widening of its main (vehicle) deck, new, more powerful engines and a bow thruster, is estimated to be \$806,600. Figure 2 illustrates what the "North Haven" and "William S. Silsby" might look like in their modified form.

The total cost for providing a new replacement vessel for the "Muskie" and modifying the "Curtis," "Libby," "North Haven," and "Silsby" is \$6,090,200, based on 1978 prices.

The acquisition of these new and modified vessels by the Maine State Ferry Service would require modifications to two of the terminals in order that the vessels could be properly accommodated. These modifications are outlined in Table 6 and include alteration of the slip configurations and aprons at both Lincolnville and Islesboro for a total cost of \$1,056,000. It should be noted that these improvements are the necessary minimum terminal modifications suggested for accommodating the new largest vessel; additional modifications at other terminals may be desired for the same reasons.



ILLUSTRATIVE SKETCH OF MODIFIED "NORTH HAVEN"/"SILSBY"

Figure 2

TABLE 6

TERMINAL MODIFICATION COSTS
(1978 PRICES)

<u>Terminal</u>	<u>Modification</u>	<u>Engineering Cost¹</u>	<u>Construction Cost</u>	<u>Total Cost</u>
Lincolntonville and Islesboro	Alteration of slips	\$122,000	\$934,000	\$1,056,000

¹Design and field inspection.

Table 7 summarizes the capital improvement costs which comprise part of the recommended improvement program. Vessel replacement/modification costs total \$6,090,200, while terminal modifications total \$1,056,000, for a grand total of \$7,146,200 in 1978 costs.

In a subsequent discussion, alternative potential means of financing the recommended improvements are described. However, if a single State (general obligation) bond issue, at 6 percent for 20 years, was assumed to be the proposed method of financing these capital improvements, the total amount needed to be bonded would be approximately \$10,780,000, taking into account the actual year in which design and construction is recommended for each improvement, and an average 7 percent yearly inflation rate for design, 8 percent yearly rate for terminal construction, and 10 percent yearly rate for vessel construction. Assuming equal annual payments, the total repayment of the bond issue required would be approximately \$18,797,000, of which \$8,017,000 would be interest charges. The annual payment itself would amount to \$939,850 yearly.

The recommended program of improvements also contains increased operating costs in addition to capital improvement costs. One such category of cost is that resulting from the use of larger vessels and/or enlarged vessels with larger and more powerful propulsion systems on each route. Table 8 summarizes these additional costs to operate the larger and more powerful vessels on present schedules for the system as a whole, starting in 1982 and continuing on to 1990, based on 1978 prices. The additional operating cost in 1982 would be \$66,200, representing a 7.2 percent increase over fiscal year 1977-78 operating costs (\$919,700). By 1986, when all of the modified and new vessels would be on line, this additional operating cost would amount to \$132,300 annually, representing a 14.4 percent increase over fiscal year 1977-1978 operating costs.

TABLE 7

TOTAL CAPITAL IMPROVEMENT COSTS

1978 Prices

Vessel Replacements/Modifications	\$ 6,090,200
Terminal Modifications	<u>1,056,000</u>
TOTAL, 1978 Prices	\$ 7,146,200
Total, Actual Construction Period Prices, 1980-1985, assuming Inflation ¹	\$10,780,000
<u>IF</u> Bond Financing @ 6% for 20 Years, Total repayment @ Equal Annual Payments: \$939,850/yr.	\$18,797,000
¹ 7% yearly for design; 8% yearly for terminal construction; 10% yearly for vessel construction.	

TABLE 8

ADDITIONAL YEARLY OPERATING COSTS RESULTING
FROM USE OF NEW/MODIFIED/REASSIGNED VESSELS WITH PRESENT SCHEDULES
(1978 PRICES)

<u>Year</u>	<u>Additional Yearly Operating Cost</u>	<u>Percent Increase Over Fiscal Year 77-78 Operating Costs¹</u>
1979	-	-
1980	-	-
1981	-	-
1982	\$ 66,200	7.2
1983	74,100	8.1
1984	102,600	11.1
1985	119,300	13.0
1986	132,300	14.4
1987	132,300	14.4
1988	132,300	14.4
1989	132,300	14.4
1990	132,300	14.4

¹Direct operating expense plus relief personnel costs: \$919,700.

Table 9 summarizes, on a route-by-route basis, the operating costs (in 1978 prices) associated with scheduling additional round trips on the various routes as recommended. As can be seen, the major expenses would be on the Vinalhaven and North Haven routes, where the spare vessel would make extra trips, in addition to the "Curtis" and "North Haven" (and later, "Libby") trips, during the peak spring-summer season. The costs for this additional service by the spare vessel would amount to \$59,500 yearly during the 1979-1980 period, and would climb to \$117,600 yearly during the 1988-1990 period. From 1980 to 1990 the "Curtis" (modified "Silsby" for one year) and modified "Curtis" would also be required to increase service from 2 to 3 round trips per day for all of October and November, at an annual cost which would reach \$9,200 by 1984. The "North Haven" would also be required to increase its service to its namesake from 2 to 3 round trips per day during May in 1982, at a cost of \$2,600. Additional trips by the "Muskie" would be required during July and August between 1983 and 1985 at a cost of \$2,800. For Swan's Island, an additional round trip by the "Libby" during July and August, at a cost of \$2,900, would be required during 1980 and 1981.

The total additional costs of operating the recommended program of improvements is given in Table 10. That is, the costs given combine the added costs incurred from operating the larger and more powerful vessels (Table 8) on present schedules plus those costs incurred in providing additional scheduled round trips during selected peak periods on each route (Table 9). Referring to Table 10, the total increase in operating costs resulting from the improvement program can be seen to equal \$59,500 in 1979, or an increase of 6.5 percent over operating costs for fiscal year 1977-1978 (\$919,700). By 1988, the additional operating costs incurred as a result of the recommended program of improvements would reach its maximum of \$259,100, where it would remain steady through 1990, since all of the new and/or modified vessels would be on line and assigned to their permanent routes by that time. This added operating cost expense represents a 28.2 percent increase over 1977-1978 operating costs. The reader is reminded that the costs contained in Tables 8, 9, and 10 are all based on 1978 prices, so that they can be compared to present operating conditions and price levels; they have not been adjusted for inflation to represent the actual "dollar" value of cost which may be incurred at any future point in time.

The recommended improvement program is the most cost-effective program evaluated in this study which considers both traffic needs and the desires of the citizens of Vinalhaven and North Haven to not have larger vessels serving their routes. A less costly program was proposed and discussed with MDOT and the Ferry Service Advisory Board earlier in the study process and would have resulted in a total cost savings to the Ferry Service of \$309,400 between 1979 and 1990, and at least \$1,157,000 between 1979 and 1999, as compared to the recommended program. It included recommendations concerning temporary and permanent assignments of larger vessels to the Vinalhaven and North Haven routes to reduce the number of additional trips which would be required by the assigned vessel and the spare vessel during the 1979-1990 period. However, as previously indicated, the Vinalhaven and North Haven representatives on the Ferry Service Advisory Board, the selectmen of these two islands, and island residents who attended the public meetings held during this study had all expressed opposition to larger vessels

TABLE 9

YEARLY OPERATING COSTS FOR EXPANDED SERVICES
(1978 PRICES)

<u>Service Improvement</u>	<u>Yearly Operating Cost</u>
Vinalhaven and North Haven	
(1) 1979-1980: One additional round trip to each island (two trips total) by "Silsby," June through September.	\$ 59,500
(2) 1981: One additional round trip to each island (two trips total) by "Silsby," June and September; two additional round trips to Vinalhaven and one to North Haven (three trips total), July and August.	74,600
(3) 1982: One additional round trip to each island (two trips total) by "Libby," June and September; two additional round trips to Vinalhaven and one to North Haven (three trips total), July and August.	77,700
(4) 1983: One additional round trip to each island (two trips total) by "Libby," May, June and September; two additional round trips to Vinalhaven and one to North Haven (three trips total), July and August.	93,500
(5) 1984-1986: One additional round trip to each island (two trips total) by modified "Silsby," June through September.	67,100
(6) 1987: One additional round trip to each island (two trips total) by modified "Silsby," April through September.	100,600
(7) 1988-1990: One additional round trip to each island (two trips total) by modified "Silsby," April, May, June, and September; two additional round trips to Vinalhaven and one to North Haven (three trips total), July and August.	117,600
Vinalhaven	
(1) 1980-1982: Operate three round trips by "Curtis" during October and November.	\$8,200
(2) 1983: Operate three round trips by modified "Silsby" during October and November.	8,200
(3) 1984-1990: Operate three round trips by modified "Curtis" during October and November.	9,200

TABLE 9 (CONT'D)

North Haven

(1) 1982: Operate three round trips by "North Haven" during May. \$2,600

Islesboro

(1) 1983-1985: One additional round trip by "Muskie" during July and August. \$2,800

Swan's Island

(1) 1980-1981: One additional round trip by "Libby" during July and August. \$2,900

TABLE 10

NET YEARLY INCREASES IN EXISTING OPERATING COSTS
 RESULTING FROM RECOMMENDED IMPROVEMENTS¹
 (1978 PRICES)

<u>Year</u>	<u>Net Yearly Operating Cost Increase</u>	<u>Percent Increase Over Fiscal Year 77-78 Operating Costs²</u>
1979	\$ 59,500	6.5
1980	70,600	7.7
1981	85,700	9.3
1982	154,700	16.8
1983	178,600	19.4
1984	181,300	19.7
1985	198,400	21.6
1986	208,600	22.7
1987	243,100	26.4
1988	259,100	28.2
1989	259,100	28.2
1990	259,100	28.2

¹ Additional yearly operating costs resulting from use of new/modified/larger vessels with present schedules (Table 8) plus yearly operating costs for expanded services (Table 9).

² Direct operating expense plus relief personnel costs: \$919,700.

on the Vinalhaven and North Haven routes. Therefore, the recommended program was advanced because it strikes a balance between cost and the desires and concerns of the island residents which the improvements would serve. It is sensitive to the consensus view of Vinalhaven and North Haven residents that larger vessels not serve their islands, and for the residents of Islesboro and Swan's Island, it provides them the larger vessels for which they indeed expressed a desire.

Program Financing

With regard to financing the recommended improvement program, several sources of funding, at both federal and state levels were examined. Federal funding sources investigated included the Federal Highway Administration, the Urban Mass Transportation Administration, the Federal Maritime Administration, and Economic Development Administration. No federal funding sources offer much promise for substantial funding of Ferry Service Improvements at this time. It appears likely, therefore, that the State would have to consider financing most or all of these improvements through state funding sources. The capital improvements, as suggested previously, can be financed through one or more general obligation bond issues. Approximately \$10.8 million would be required to effect all the capital improvements contained in the recommended program. Additional operating costs resulting from use of the larger and more powerful vessels and expanded trip schedules are an operating expense line item, and can best be covered, as they are for today's operations, by the combination of fare box revenues and annual state appropriation.

GENERAL FERRY SERVICE IMPROVEMENT RECOMMENDATIONS

Several suggestions for general, systemwide improvement of operations and procedures of the Maine State Ferry Service, made at the island public meetings, meetings with island officials, and at the Ferry Service Advisory Board Meetings received considerable support on several or all islands. These suggestions are deserving of further consideration by the Ferry Service because of their widespread support, and are as follows:

Advanced Reservations Procedures

Consideration should be given to reducing the advanced reservation period, which presently is unlimited, to 30 days. Year round island residents complain that seasonal residents and tourists often reserve up to one year in advance because their arrival and departure times on the island are firm, whereas year round residents cannot establish firm dates so far in advance, thus placing them at an unfair disadvantage. A 30-days maximum reservation time would still enable seasonal residents, tourists, or others to make reservations on specific dates and trips in advance, but would also give year round residents, at least psychologically, the feeling that they can compete on an equal basis with seasonal residents and tourists for reservations.

Reduced Rates for High-Volume Users

All ferry users favor, as expected, some sort of fare break. The year round island residents especially feel this way, as they are the single

largest group of high-volume users of the system. Support exists for multiple-ride tickets, or "commutation" tickets as they are called by some users. These tickets can potentially benefit both the user and the Ferry Service. That is, reduced rates are offered to the user, but within a ticketing package which requires him to make more trips, or lose the dollar benefits derived from the reduced rates. A 12-ride ticket or book good for 90 days, purchased at a reduced rate of 10 percent in roundtrip fares, is suggested to represent one such reasonable package. Unused tickets would not be redeemable after the expiration date. Some sort of identification system would have to be instituted, however, to insure that these "discount" tickets are not passed off to other users, which would negate any benefits of such a system to the Ferry Service. The Maine Department of Transportation should study potential multiple ride/reduced-rate plans, and if found to both provide actual benefits to users without losses of revenue to the Ferry Service, should implement such a program.

Vehicle Tariff Charges

Vehicles larger than automobiles are charged according to weight under the present tariff. Weight is an important factor, especially on the smaller vessels, in determining how many vehicles can be carried on a given trip, due to stability reasons, and is therefore a suitable measure to gauge fare charges by. One or more large trucks at or near the legal load limit can force a vessel to leave other vehicles behind at the terminal, even though "space" exists on the vessel to carry them. However, vehicles especially trucks, occupy space which is not always proportional to weight, e.g., a tractor-trailer combination generally takes up the space occupied by three automobiles, whether it is empty or full. Consideration should be given to a tariff based on some combination of weight and length, say by (1) weight first and then by length, or (2) by weight and length separately, with the resultant fare charged based on whichever measure (weight or length) is more critical relative to the vessel's capacity.

Schedules when Smaller Vessels on Route

On all routes except for the North Haven route, which is served by its 9-automobile, 125-passenger namesake, a smaller vessel is operated periodically when the assigned vessel (e.g., the "Libby" on the Swan's Island route and the "Muskie" on the Islesboro route) is in for drydocking and repairs, etc. This decrease in vessel capacity often adversely affects the level of service offered on the route because trip frequency is not adjusted accordingly to offset this capacity decrease. Consideration should be given to expanding trip frequency according to a set timetable or schedule when the smaller vessels are employed, to counteract this effect.

Parking Fees for Vehicles Denied Transportation

Island residents on some routes have complained that they have been charged an overnight parking fee after the last trip when they have been forced to leave the vehicle on the mainland because of insufficient available space on the vessel. No such fee should be charged because of these users' unintentional predicament. MDOT agrees, and sees no problem in not charging such users for overnight mainland parking.

Information Systems

Consideration should be given by the Ferry Service to encourage or even promote advertisement at the mainland terminals of what facilities and activities are and are not available on the islands. Such displays generally exist at Rockland for Vinalhaven and at Bass Harbor for Swan's Island. Ticket agents at all the mainland terminals should continually be briefed as to the existence of, and changes in, specific island activities, as they often are the primary spoken sources of tourist information on the islands.

Trip Cancellation/Scheduling Decisions

Both captains and islanders alike appear to welcome a more formal presentation of guidelines for captains to follow with regard to cancelling trips due to weather conditions, scheduling extra trips, and notifying users of the same. Discretion is still required and desired on the captains' part for specific situations, but some standardization of procedures could ease the tension which often develops due to apparently unexplainable changes in scheduled trips.