



**THE FEASIBILITY OF WATERBORNE PASSENGER  
TRANSPORTATION ALONG BOSTON'S CHARLES RIVER**

**U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL TRANSIT ADMINISTRATION**

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**Prepared by:**

**Nancy A. LaBranche  
& Martin C. Pilsch  
Urban Harbors Institute  
UMASS - Boston  
100 Morrissey Boulevard  
Boston, MA 02125-3393**

**Prepared For:**

**The office of Technical Assistance and  
Safety  
Federal Transit Administration  
U.S. Department of Transportation  
400 Seventh St., S.W.  
Washington, D.C. 20590**

**FINAL REPORT PRESENTED BY:**

**UNIVERSITY OF MASSACHUSETTS - BOSTON  
URBAN HARBORS INSTITUTE  
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16. Abstract  <p>The purpose of this report was to analyze the feasibility of instituting commuter ferry service on Boston's Charles River from Newton, Massachusetts, a suburb of Boston to points in Cambridge, Massachusetts and Boston. The Urban Harbors Institute utilized survey, telephone query, personal interview, on site inspection and document research to gather the information upon which it has based this report.</p> <p>The Institute found that ferry service, while feasible given the correct ingredients, is not practical. A number of issues factor into this basic finding, including: vessel operational considerations, scheduling, actual trip time, lack of intermodal connections and parking and service convenience. Although the market appears to be strong enough to support a commuter service, the actual fact of whether the service would be patronized is questioned.</p> <p>It was concluded that the service would not be viable for a private operator, however, public assistance, should it be available, would support the necessary development period. In addition, it was concluded that quite possibly a water taxi service could survive and would be a significant contribution to the transportation system along the Charles River.</p> <p>The report recommends that the suburban communities consider working to institute a water taxi service, develop the market and work toward a commuter service in conjunction with public transportation organizations.</p>			
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- 1 mile (mi) = 1.6 kilometers (km)

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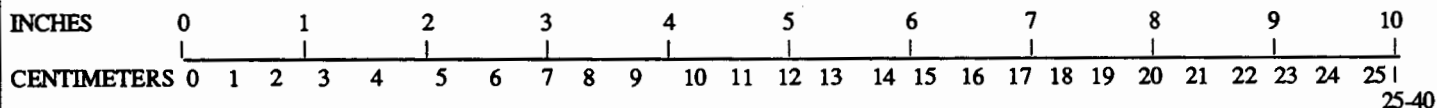
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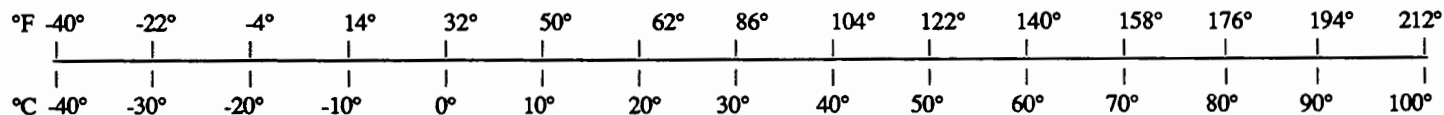
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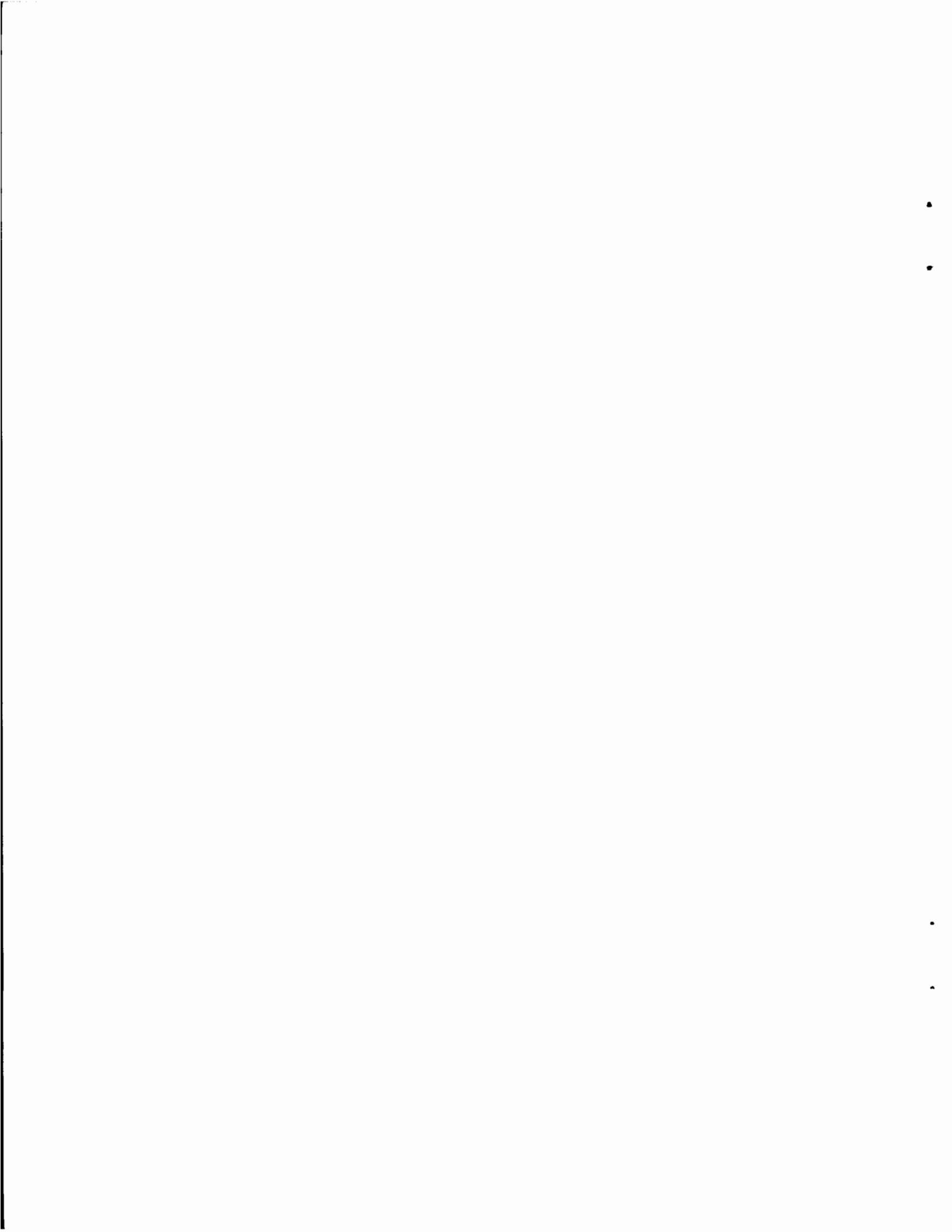
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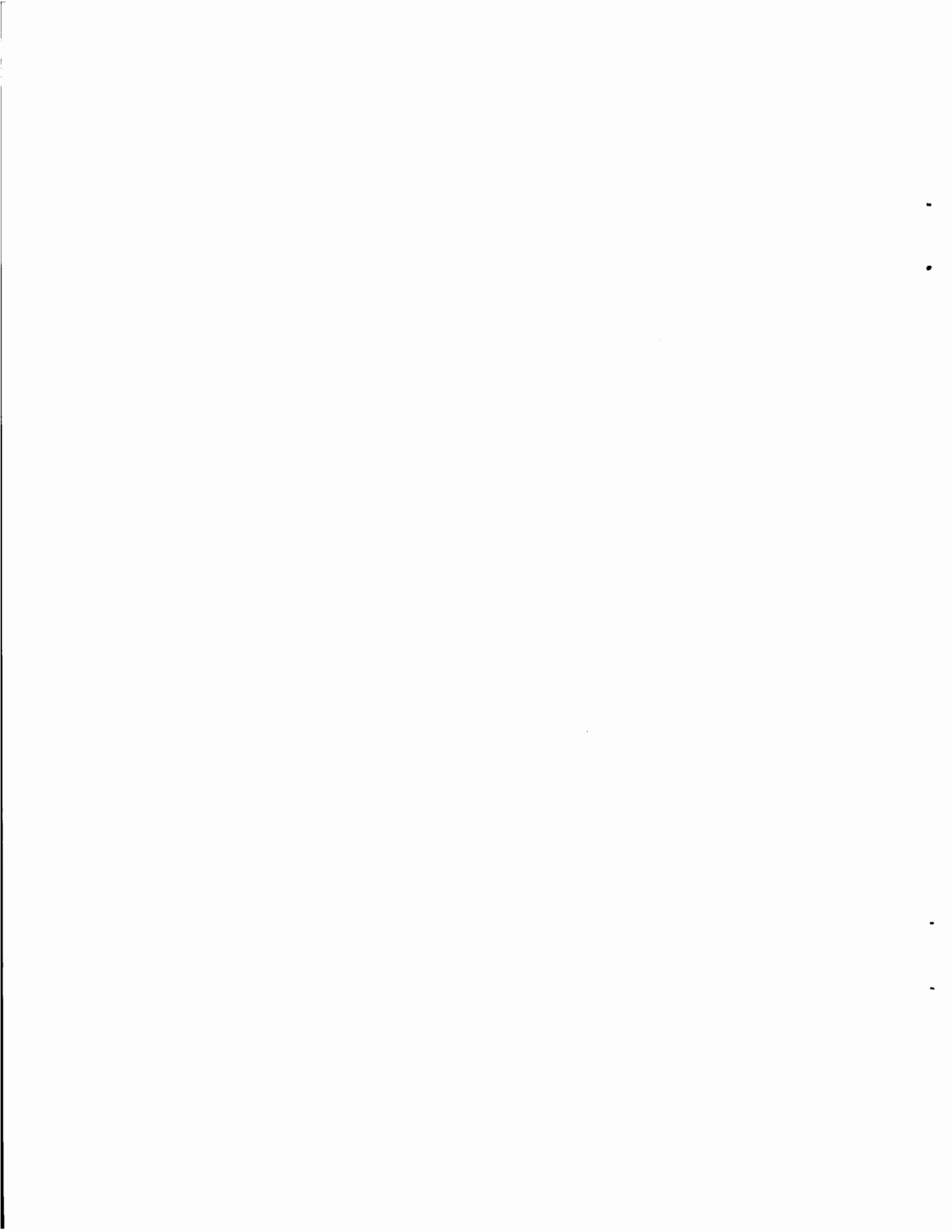
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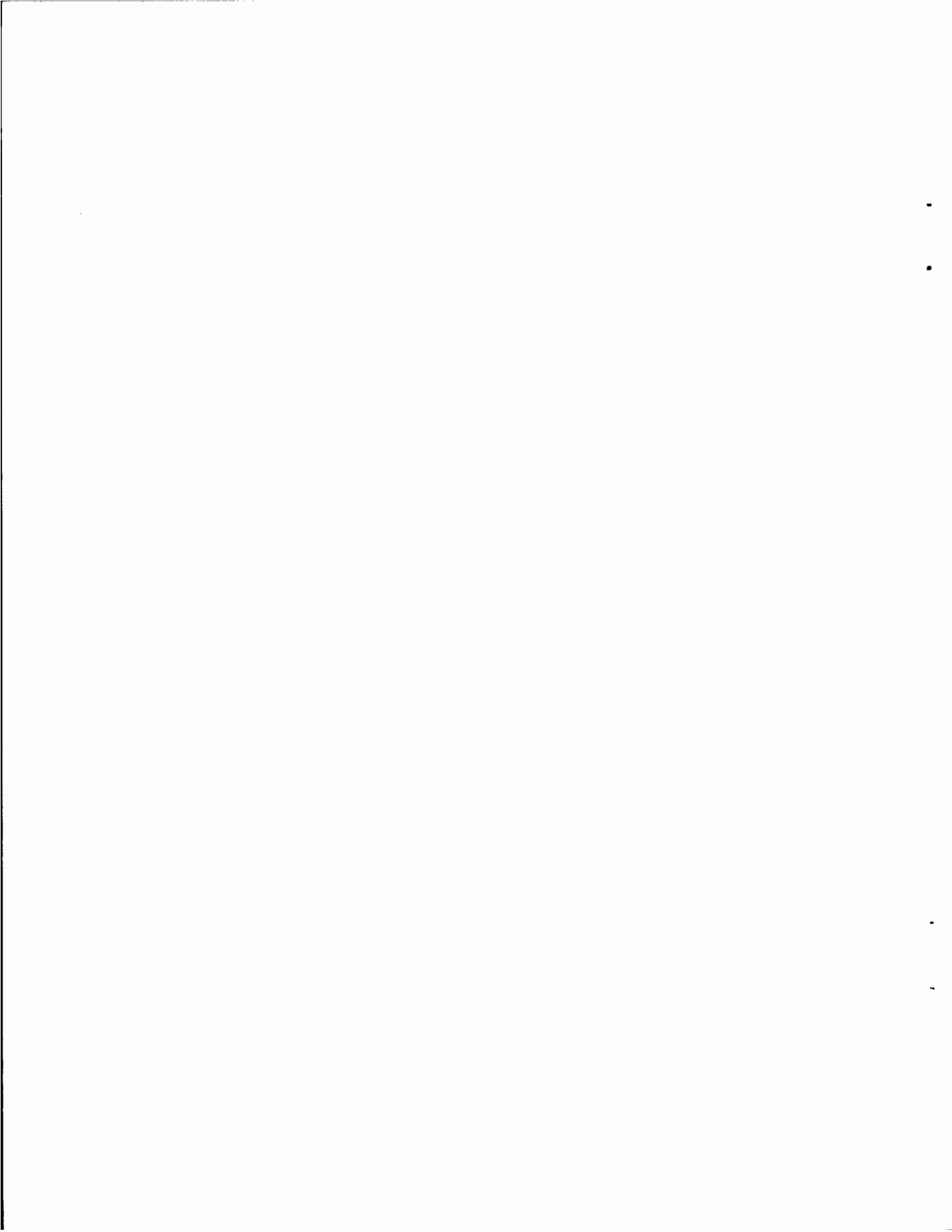
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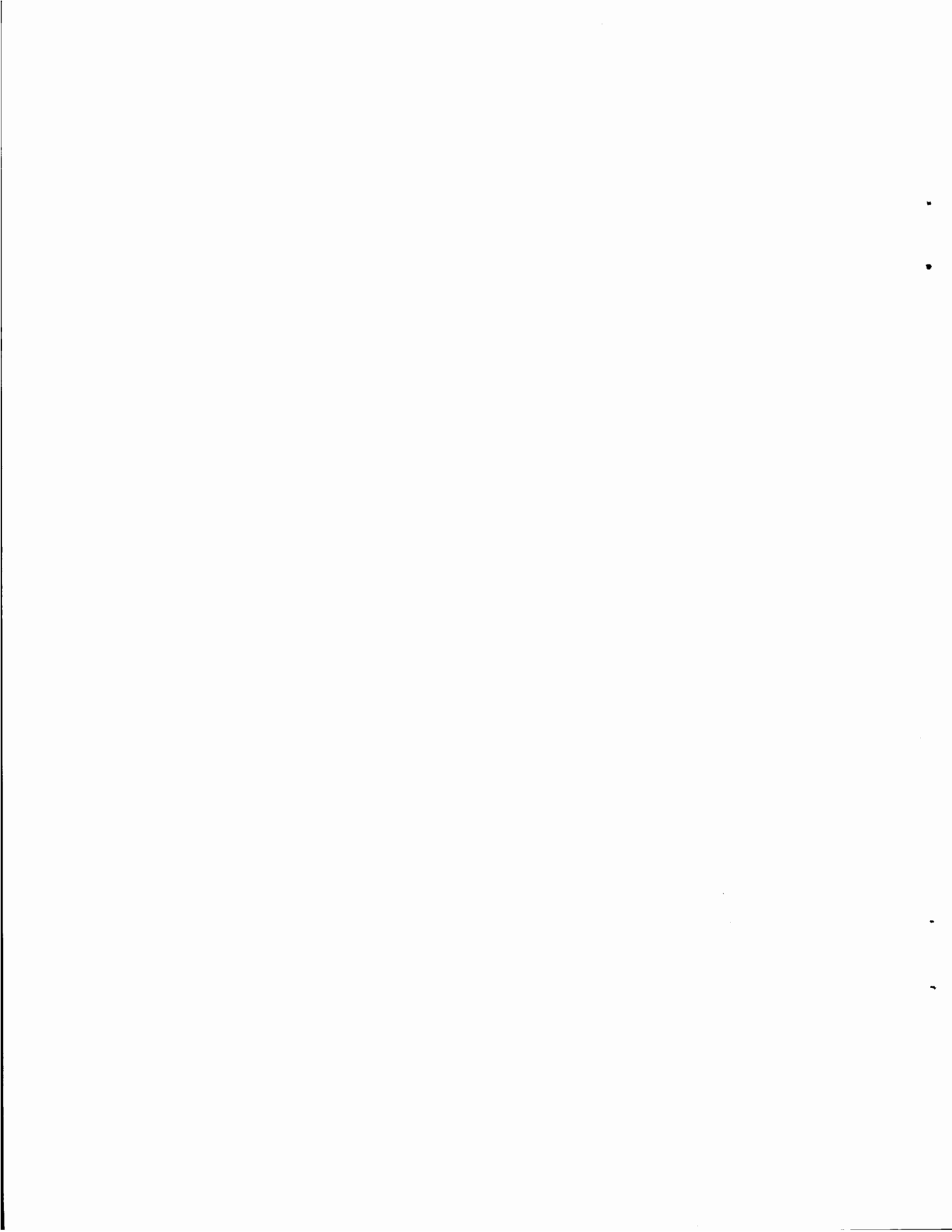
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## **THE FEASIBILITY OF WATERBORNE PASSENGER TRANSPORTATION SERVICES ALONG BOSTON'S CHARLES RIVER**

### **1.0 INTRODUCTION**

#### **1.1. GENERAL**

In the history of the City of Boston, there has not been as significant a challenge to the capacity of the transportation infrastructure of the urban area as is now being presented. Three massive construction projects are underway simultaneously. While they are expected to relieve an already difficult congestion problem in the future, they are creating their own set of difficulties for the present.

All traffic arteries leading into and out of the City of Boston have been affected to date by peripheral preparations. At least one of the three projects is anticipated to last into the next decade and the impact of all three on the entire Boston area traffic pattern is expected to continue throughout that time. Organizations seeking to mitigate construction impacts, have suggested a number of approaches including transportation alternatives.

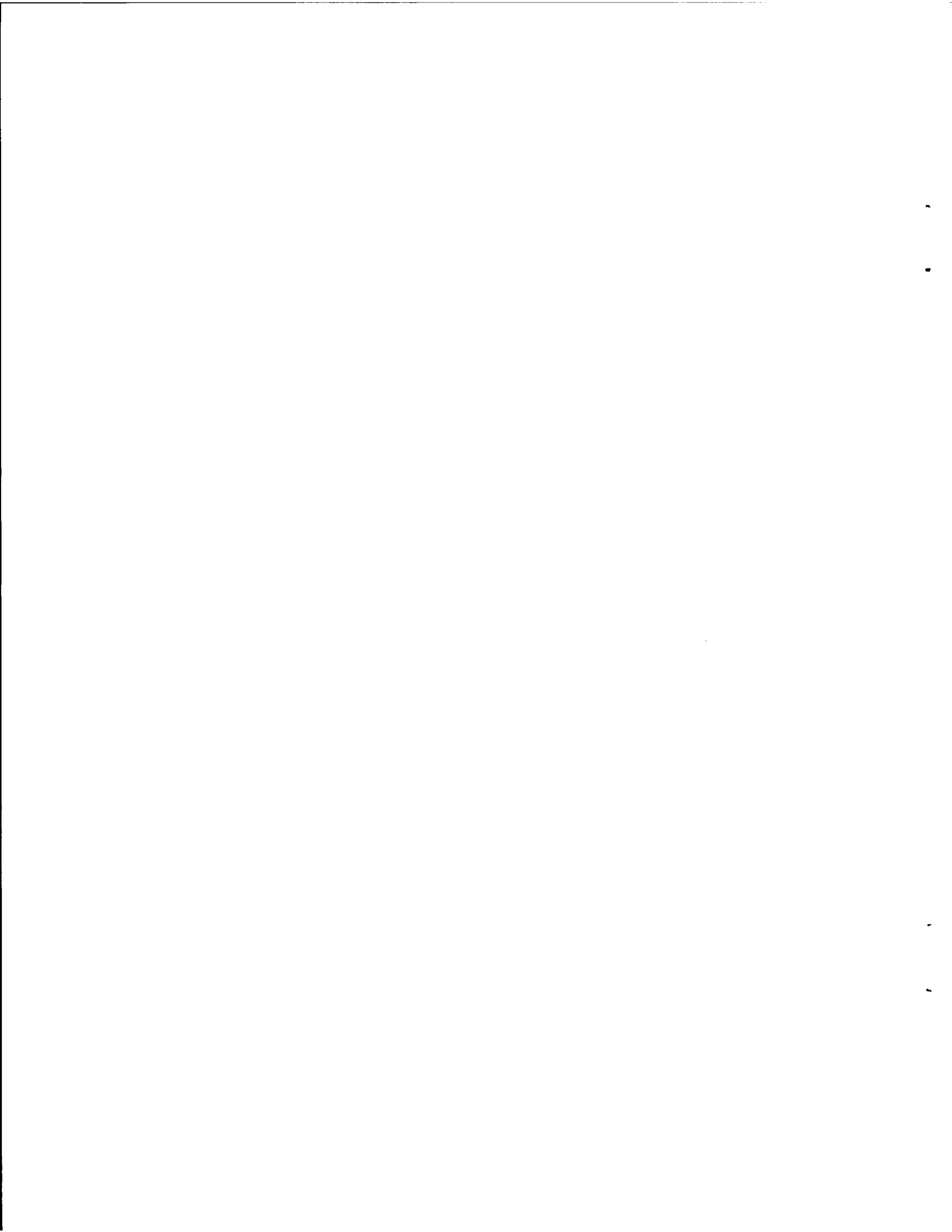
Considering the development of various waterborne commuter routes is among those alternatives. Studies have been written on water commuter services including: the feasibility of service from the North Shore of Massachusetts, an increase in South Shore ferry routes and new connections such as service between Boston's commuter rail hubs - South Station & North Station and South Station to the Charlestown Navy Yard. The only general area that has not been formerly considered for water transit service link-ups are the suburbs just west of Boston.

In August 1992, a request was made by representatives of the community of Newton, Massachusetts that the Urban Harbors Institute, at the University of Massachusetts in Boston, conduct a feasibility study regarding water transportation on the Charles River. The Institute, as part of its National Waterborne Transportation Study, was in the process of formulating work tasks as part of its second phase and agreed to pursue the issue.

To the interested citizens, members of the Riverrun Associates and the Newton Corner Task Force, the idea of a waterborne commuter service along the Charles River, seemed logical for two reasons: (1) Anticipation of an increase in the already serious vehicular congestion problems affecting their area; (2) Reduction of neighborhood parking by commuters and traffic problems related to pedestrian safety issues in the immediate area (Newton Corner) as well as in other sections.

The Newton Corner Task Force issued a report to the Newton Board of Aldermen in April 1993 in which they encouraged the Mayor to:

- Increase the availability of non-auto transportation
- Promote water transportation on the Charles River to Cambridge and Boston.
- Lobby for subsidy for water transit from the MBTA
- Ask the MDC to consider suitability of faster boats on the Charles River.
- Develop Daley Field and Christian Herter Park as park and ride lots for all-day parking.





Terry O'Halloran, a member of the Newton Corner Task Force and now an Alderperson herself in Newton, urged the Board of Aldermen to:

"Urge relevent officials to permit and, if necessary, implement a water-tax service from Daley Field to downtown Boston."

Additional concerns are relative to Boston's "Big Dig" (the depression of the Central Artery located in the middle of the City of Boston), a project that will eventually affect traffic flowing into and out of the city from all areas. Commuters traveling from communities west of Boston will experience additional difficulties with their commute when the project reaches peak activity. As a result, people may not only want to consider additional public transportation alternatives, they may be forced to.

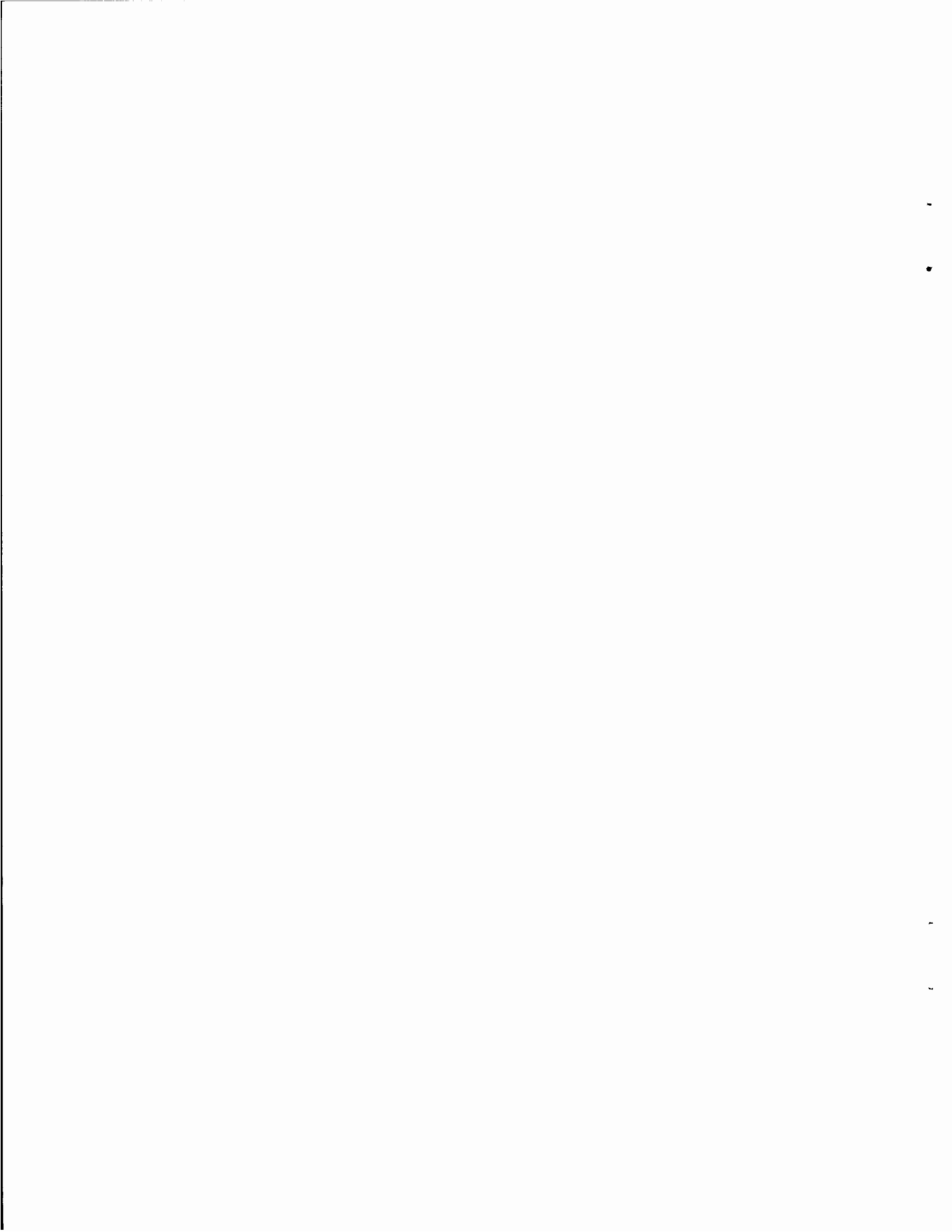
The Newton town representatives theorize that increased alternatives for public transportation, including water passenger transportation services, would greatly reduce or in the least, relieve congestion, enhance accessibility and increase safety in their area. Their objective is to rally support for state supported transportation alternatives through the establishment of the feasibility of one such alternative, a waterborne passenger service on the Charles River.

With the mission of determining the feasibility of establishing a commuter based ferry system between Western suburbs and Boston, along the Charles River, Urban Harbors Institute (UHI) embarked upon the following study under the auspices of the Federal Transit Administration, U.S. Department of Transportation.

## **1.2 PROPOSAL**

The proposal submitted by the Urban Harbors Institute to the Federal Transit Administration included six tasks:

- **Task 1** - Gather commuter population and supporting demographics for the Newton, Massachusetts area and surrounding communities.
- **Task 2** - Determine the methods of commuting utilized by the communities identified and the volumes of commuters utilizing each mode.
- **Task 3** - Analyze the commuting process for all modes of transportation including: routes, parking, intermodalconnections, availability, frequency, time factors, and cost.
- **Task 4** - Identify the advantages and disadvantages offered by a proposed ferry operation along the Charles River and what might be considered in establishing and operating a viable service.
- **Task 5** - Based upon the data above, analyze the operational and financial feasibility of establishing a commuter ferry service along the Charles River.
- **Task 6** - Establish some basic parameters to be utilized in the analysis of viable ferry routes.



### **1.3 METHODOLOGY**

The process utilized in collecting data and information for this feasibility study included:

- Personal interviews with local residents, transportation, recreational, and government officials and parties responsible for business, commercial and educational institutions along the Charles River.
- On-site visits along the proposed route including a tour of the river and critical navigational areas.
- Research utilizing local photo portfolios, historical documents and mapping sources.
- Questionnaire survey conducted by personal interview, telephone and mailings.
- Construction of a data base and development of reports based upon the results of the survey.
- Collection and analysis of statistical information and research documents.

### **1.4 ISSUES**

The following report will address a number of the issues that the Urban Harbors Institute feels are important in the development of a decision relative to the feasibility of waterborne commuter service on the Charles.

These issues include:

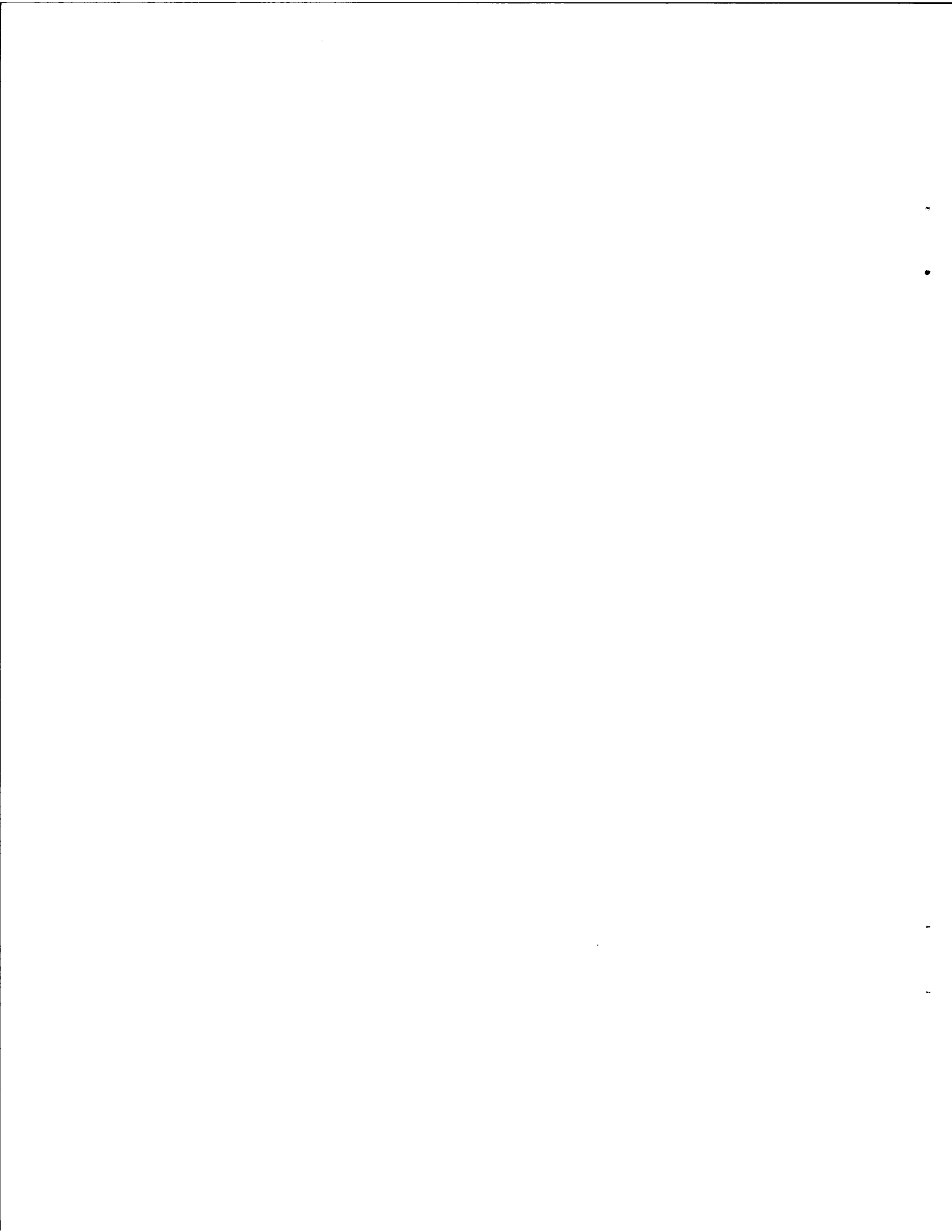
- The size and the general attitude of the market that would potentially support a ferry system.
- The present commuting habits of the residents.
- A description and comparison of existing forms of public transportation from the Newton, Watertown and Waltham areas to Boston.
- The potential social and environmental impacts of a ferry system on the river and its communities.
- Operational considerations and constraints.
- Potential ferry system routing and scheduling.
- Characteristics of the Charles River.
- Design and placement of docking facilities.
- The financial impacts.
- Constraints of a proposed service if it is in fact, feasible.

### **2.0 FINDINGS**

The Urban Harbors Institute (UHI) concentrated upon three areas which it considered critical to an analysis of the feasibility of waterborne commuter service along the Charles River. We analyzed the market available to a potential water service, the operational aspects of that service and the general financial outlook should a service be initiated.

#### **2.1 General**

We found generally that the actual creation of a waterborne commuter service was feasible but not realistic. We did find, however, that the creation of a waterborne taxi service was feasible and ,was also realistic.



## **2.2 The Market**

UHI found that the market available to a potential water commuter service is substantial enough to adequately support the service, however, the difficulty will be in capitalizing upon this market.

UHI found that the communities of Newton, Waltham and Watertown would be the ones most likely providing the major support for a waterborne commuter service along the Charles River, however, we also discovered that a number of people board buses and rail in this area, coming from other communities.

UHI also found that the initial "off the cuff" responses from the regular commuters in this area were positive on the idea of a waterborne commuter service down the Charles. There was also interest expressed by commercial interests for some form of waterborne passenger service, whether a commuter service or a water taxi service, on the Charles River.

UHI found that there is a combined total of 181,500 plus people residing in the communities of Newton, Waltham and Watertown and that an estimated 43,000 of these people commute to either Boston or Cambridge daily.

UHI also found that:

- The largest percentage of people commuting to Boston or Cambridge from all Massachusetts suburban locations, do so alone, in their automobile. This fact seems to hold true for those commuting along routes parallel to the Charles River from the western suburbs of Newton, Waltham and Watertown, however, the percentage of commuters from these locations is far less. The percentage of the population of these cities utilizing public transportation is slightly above average compared to other Massachusetts communities.

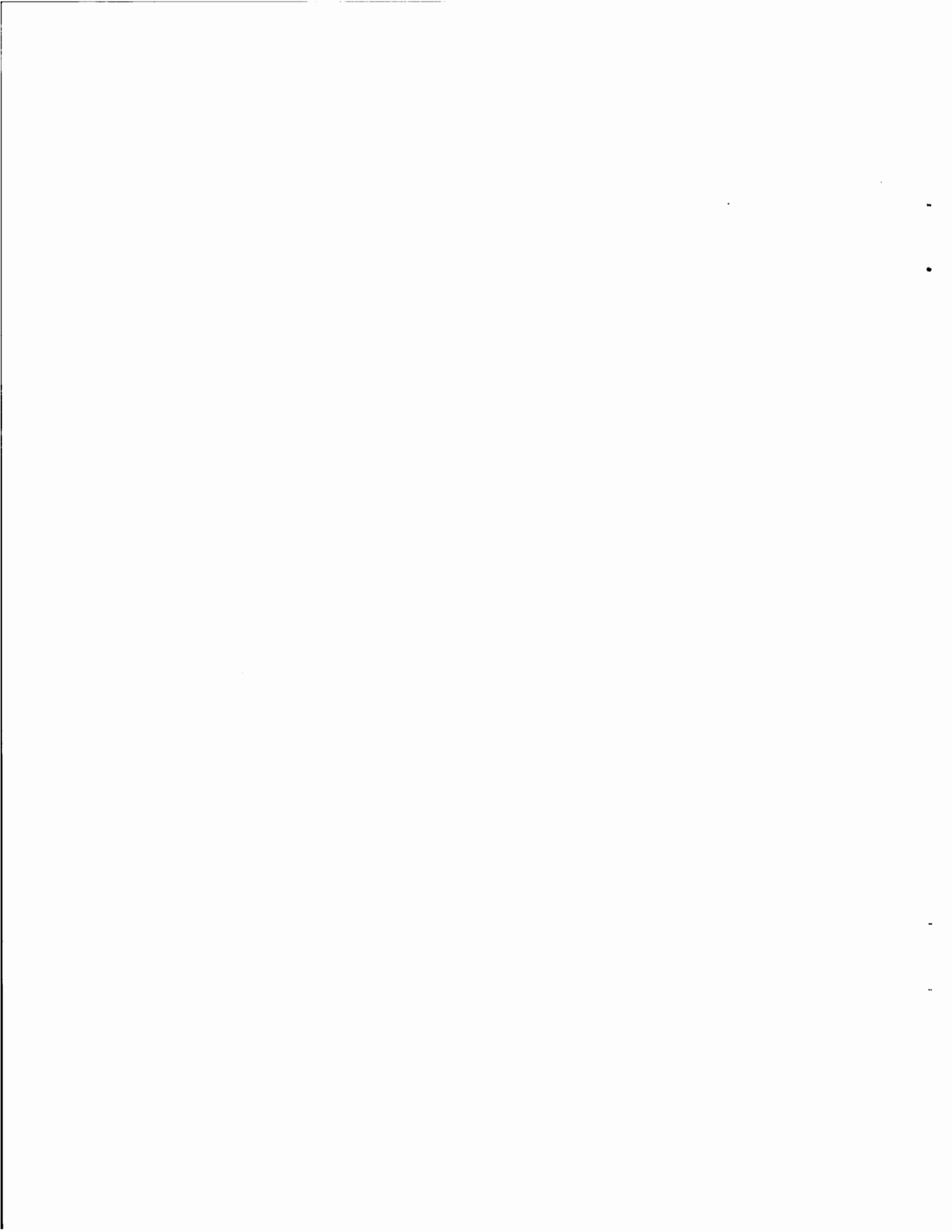
- That the majority of the commuters in Massachusetts utilizing public transportation where waterborne service is available, (South Shore and Charlestown) utilize bus or rail.

- That 23.7% of the total population of the three communities commute to either Boston or Cambridge and that approximately 10.2% of the total utilizes public transportation while commuting. Approximately 17.2% of the total population commute to Boston and approximately 7.4% of that total utilizes public transportation. Approximately 6.5% of the total population of the three communities commutes to Cambridge of which 2.8% of that total utilizes public transportation.

- That of the total daily commuters traveling from these communities to Boston, over 43% utilize buses, street car or subway or commuter rail. Over 44% of the daily commuters use public transportation to Cambridge.

## **2.3 The Operation**

UHI found that the single most important ingredient to a successful commuter service - a regular, dependable schedule - was the main thing that would be questionable for a waterborne commuter service from Newton/Waltham/Watertown via the Charles River to both Cambridge and Boston. We found that a number of operational constraints including: scheduling, time, navigational, weather and social elements will have major negative impacts on the creation of this service.



UHI found that for at least nine months of the year, the Charles River is heavily utilized for recreational and athletic activities. In addition, we found that the reason that that activity is curtailed during the remaining three month period, weather, is the same reason that a regularly scheduled commuter service will be unable to provide one of the most essential factors to the success of a commuter service, guaranteed daily operations.

UHI found that the practice time for college rowing teams coincides with the daily commuter schedule for travel to work. Recreational rowers are on the river at all times of the day but are in force during morning and evening practice sessions. Sail boaters both regular and student sailors, are also out on the river during all times of the day, especially during a period, Mar/Apr to Oct. We found that these activities would severely affect the schedule of a commuter vessel and would impact the ability of this service to provide an acceptable schedule.

UHI found that a commuter ferry traveling at the allowed speed limit would cause minimal shore erosion and would be reasonably safe for recreational boaters, however, would be too slow for commuter operations.

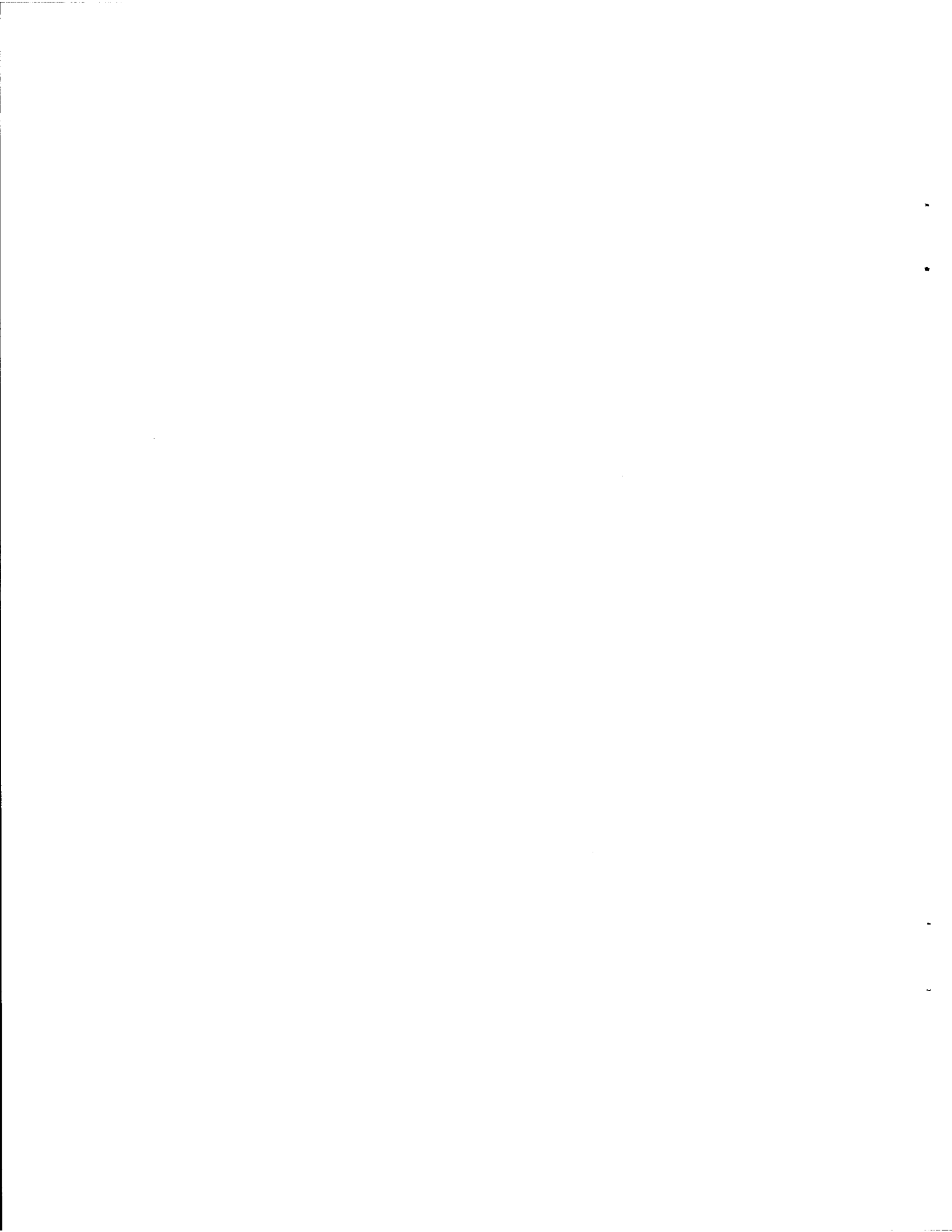
UHI discussed this issue with the operator of an excursion vessel on the river during the warmer weather and found that the owner has seemed to find a comfortable level of activity to suit other river users. UHI found, however, that the speed this operator maintains would be restrictive for a commuter service and would severely affect the time required to travel from the Newton/Watertown area to Boston. It would place a waterborne commuter service in somewhat of a non-competitive position with respect to time and schedules and market capabilities.

In discussion with the various recreational users of the river, they indicated that they were adamantly opposed to additional vessel traffic, especially power driven, on the river.

Investigating the route from the Newton/Waltham/Watertown area to Cambridge and Boston, UHI found that there are a number of physical obstacles that would potentially affect navigation and trip time. We found there are a number of bridges that span the Charles River, some of these bridges with low vertical clearances. There is also a lock system at the Boston end of the Charles, and a railroad bridge utilized by commuter rail systems, also at the lower end of the river, both of which would severely affect any hopes of a timely commute from the three communities to the Boston waterfront area and Logan Airport.

UHI also found that:

- A very low profile vessel, required to operate under the bridges spanning the river, is readily available or can easily be designed and built at a reasonable price.
- There is a need to develop a number of land side features generally connected with a waterborne commuter service including docking facilities, parking and land transportation connections.
- That there were areas easily identifiable as stop-off sites for a regularly scheduled commuter or taxi service, however, there were not enough areas with docking facilities to support an on-call taxi service.
- That there would be a requirement for more docking facilities if either water service were implemented and improvement of many of the facilities now in place.





- That there are very few parking accommodations available at proposed docking facility locations in the Newton/Waltham area and what parking is in place in these locations is not available at this time for this type of utilization.
- That there is a lack of both parking, drop-off and pick-up area and intermodal interface at the present or the proposed docking sites along both sides of the Charles River.
- That there would be weather related constraints for a service of this type on the Charles River.
- That the river does freeze over during the winter and at times is impassable.

## **2.4 Financing**

UHI found that a pure commuter service would be hard pressed to survive financially unless subsidized by a public entity. A waterborne commuter service would necessarily have to set its rates based upon a competitive structure established by the other public commuter modes to initially develop its market. If subsidized, the public support would be provided based upon the difference between actual cost and the competitive levels.

UHI found that a commuter service would be required to provide more than one vessel to maintain a viable schedule, which in turn would assist it in attracting the level of passengers necessary to compensate it for its investment. In so doing, the operator will increase his initial investment and his daily operating expenses.

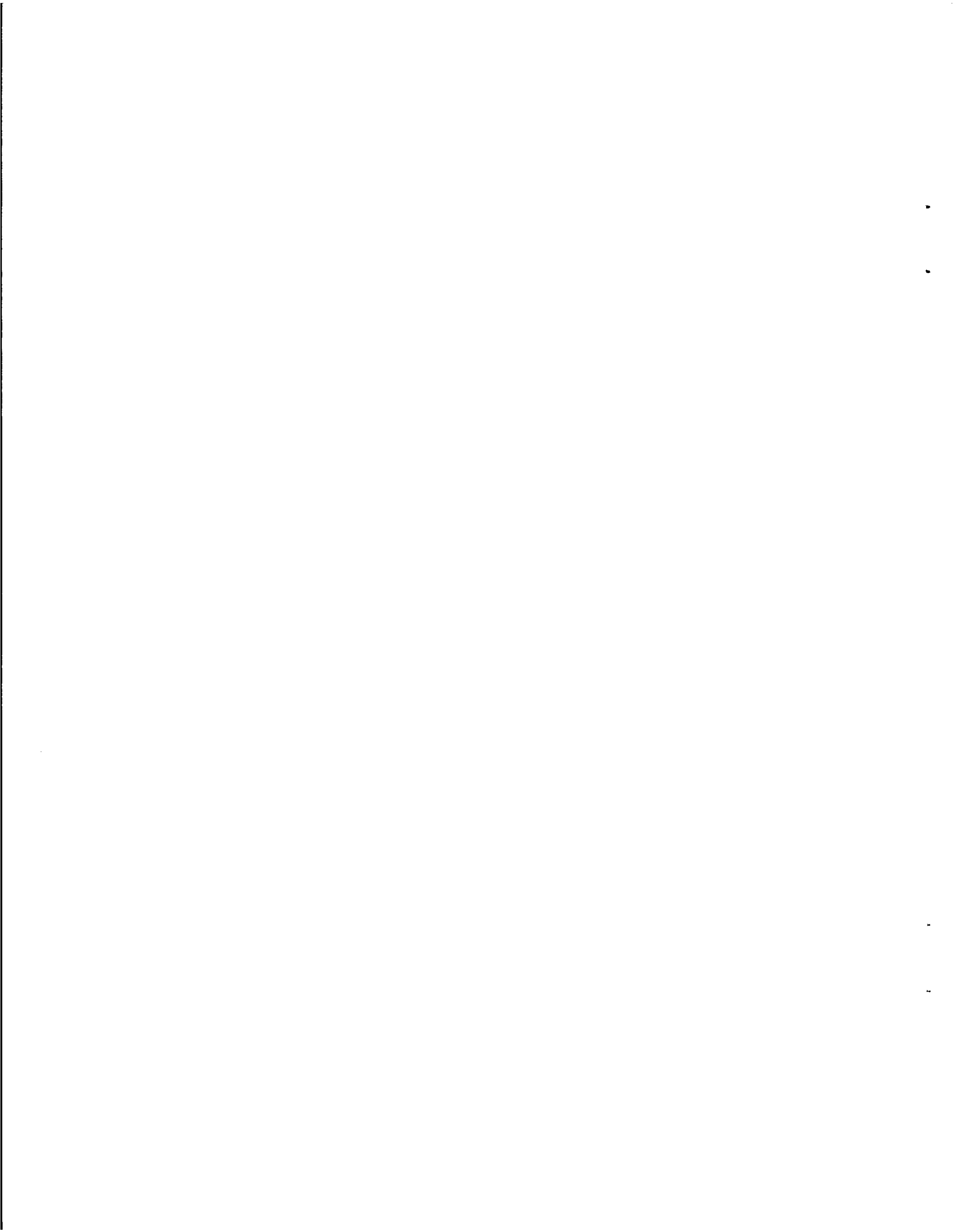
UHI determined that based upon the constraints of operation along the Charles, an operator seeking to provide a daily commuter service must also seek alternate uses for his equipment both in season and off-season to maximize his investment.

## **3.0 GENERAL CONCLUSIONS AND RECOMMENDATIONS**

### **3.1 CONCLUSIONS**

UHI has generally concluded that a regular waterborne commuter service along the Charles River will not be feasible unless public support to carry the service during the start-up period is available. Although elements that are critical to the success of a water commuter service were discovered, supporting a positive conclusion (market and viable destinations), the more critical elements, those that attract the market and allow smooth transit to the ultimate destinations, are not. The Charles River is not conducive to regular, year round service for something as critical as a commuter capability. The customer ultimately demands a service that can be depended upon to operate every day. The inability to operate year around, due to weather, and efficiently, due to constraints upon time and schedule that are imposed by very low maximum travel speeds, impacts the private operator's ability to build a viable revenue stream through a steady clientel.

UHI did, however, conclude that a seasonal water taxi service along the Charles River would be feasible and given the proper support by the public as well as many of the commercial and institutional organizations along and adjacent to the river, would survive nicely.



## **3.2** GENERAL RECOMMENDATIONS

UHI recommends that a more detailed look at the funding and organization of a water taxi service be conducted, considering what would be necessary to institute that type service on the Charles River. It is felt that daily commuter services will eventually result as the attractive aspects of traveling on the river become known. UHI recommends that it be left to happen in that manner. It is recommended that whoever conducts this follow-up, contact the sports and recreational organizations utilizing the river, the public agencies controlling certain aspects of the transportation and traffic control on or adjacent to the river, the commercial and insitutional organizations interested in these services, private boat operators and vessel design and construction firms with expertise in operations and vessel design.

Should the communities wish to pursue the institution of water commuter transportation services on the Charles River immediately, it is then recommended that they seek the assistance of the organizations responsible for recreational facilities along the Charles, mass transportation in the greater metropolitan Boston area and for traffic control on the Charles River. Local mass transportation authorities must be available to provide support for capital (vessel and facilities) and operational funding. Traffic control on the Charles is essential to the ultimate success of any commuter service and liberalization of speeds, if at all possible, will be essential to the viability of the service.

## **4.0** **DISCUSSION**

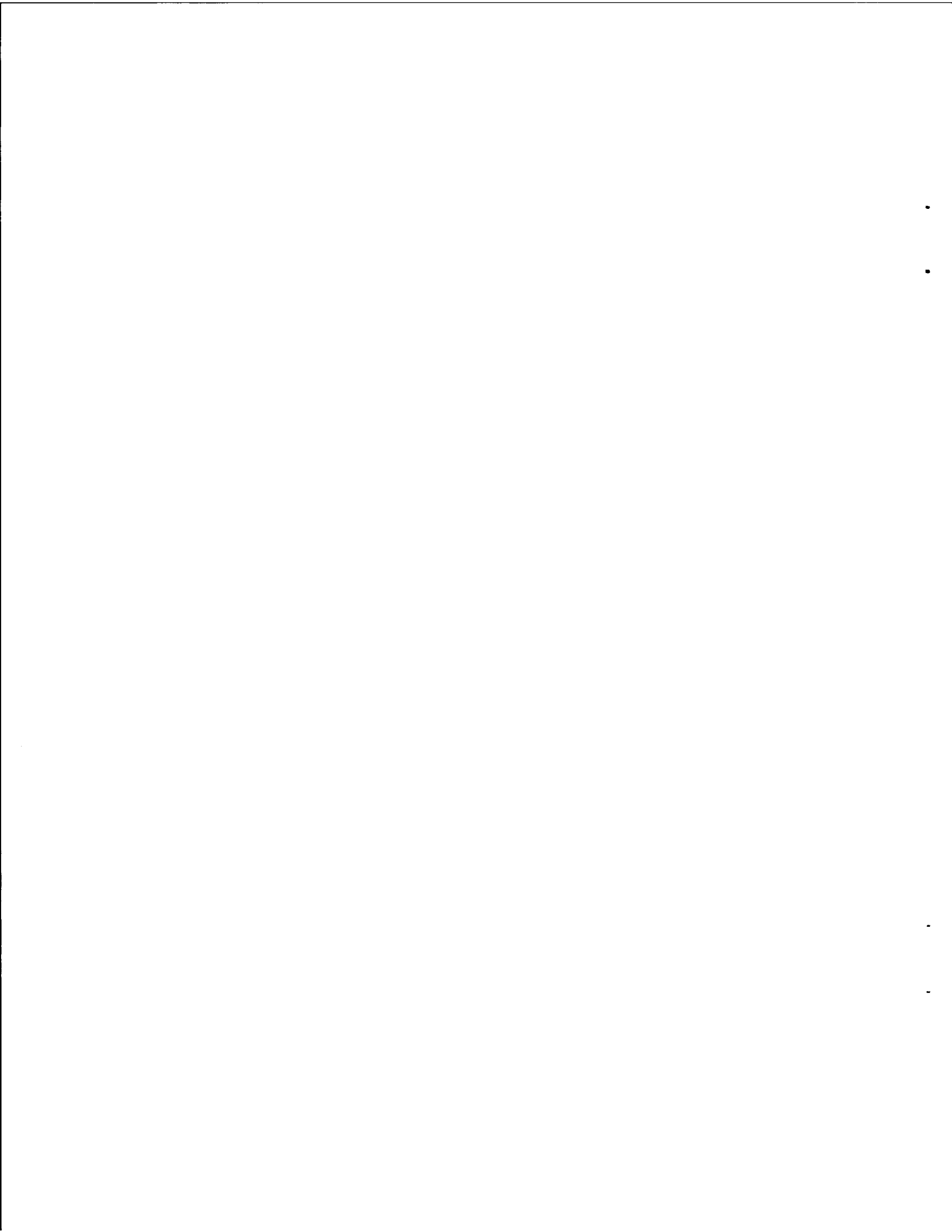
### **4.1.** **GENERAL**

#### **4.1.1.** Historical Information

According to Max Hall in his book The Charles-The Peoples' River, the area surrounding Boston and its western suburbs originally existed as a glacier. Some eleven thousand years ago during the period of glacier melting, the significant runoff helped create what is now known as the Charles River. Hall indicates that "the shape of the river was caused by several things: glacial debris, the shape of the bedrock, and great chunks of melting ice."

The Charles River, with occasional chunks of ice floating during winter seasons, existed as a tidal estuary until a dam was constructed in Boston in 1908. As a result, the river level remained between seven feet above mean low tide and approximately two feet below mean high tide. The dam, however, was not adequate to prevent flooding when there were heavy rains and snowstorms. As a result, the Army Corp of Engineers constructed the Charles River locks completed in 1978. The new locks, which also included a pumping station, are located about one half mile east of the original Boston dam.

During the same period that the Boston dam was constructed (1908), work was continuing on the development of parkland at the river basin and along the river's banks. This project was continued over a span of approximately eighty years and was accomplished in four stages, nearly twenty years apart.



The first stage of the parkland, called Charles Bank, was started in 1890 at the basin area in the West End of Boston. In 1910, the second stage called the Boston Embankment, began along the river's edge. This area became what is today referred to as **The Esplanade**. The roadways stretching along either side of the Charles, designated Memorial Drive and Storrow Drive, were originally constructed in the early 1900's. In the 1950's, Storrow Drive was expanded to what we know today and in the late 1980's the eastern portion of Memorial Drive was rerouted to accommodate developments along the river's edge.

Boating on the Charles River has been largely a combination of recreational activities. Rowing, a primary generator of traffic volume on the river, especially during the school year, is supported by the numerous universities and rowing clubs lining both shores.

The rowing population represents a strong voice on river activity. In addition, a number of marinas line the Charles as do sailing facilities. Over the past five years, the Charles Riverboat Company has begun sightseeing and excursion services along the Charles. This private boat company operates two vessels and provides tours as well as charter, catered parties and business activities under the auspices of the Metropolitan District Commission (MDC).

#### **4.1.2 Description of the River**

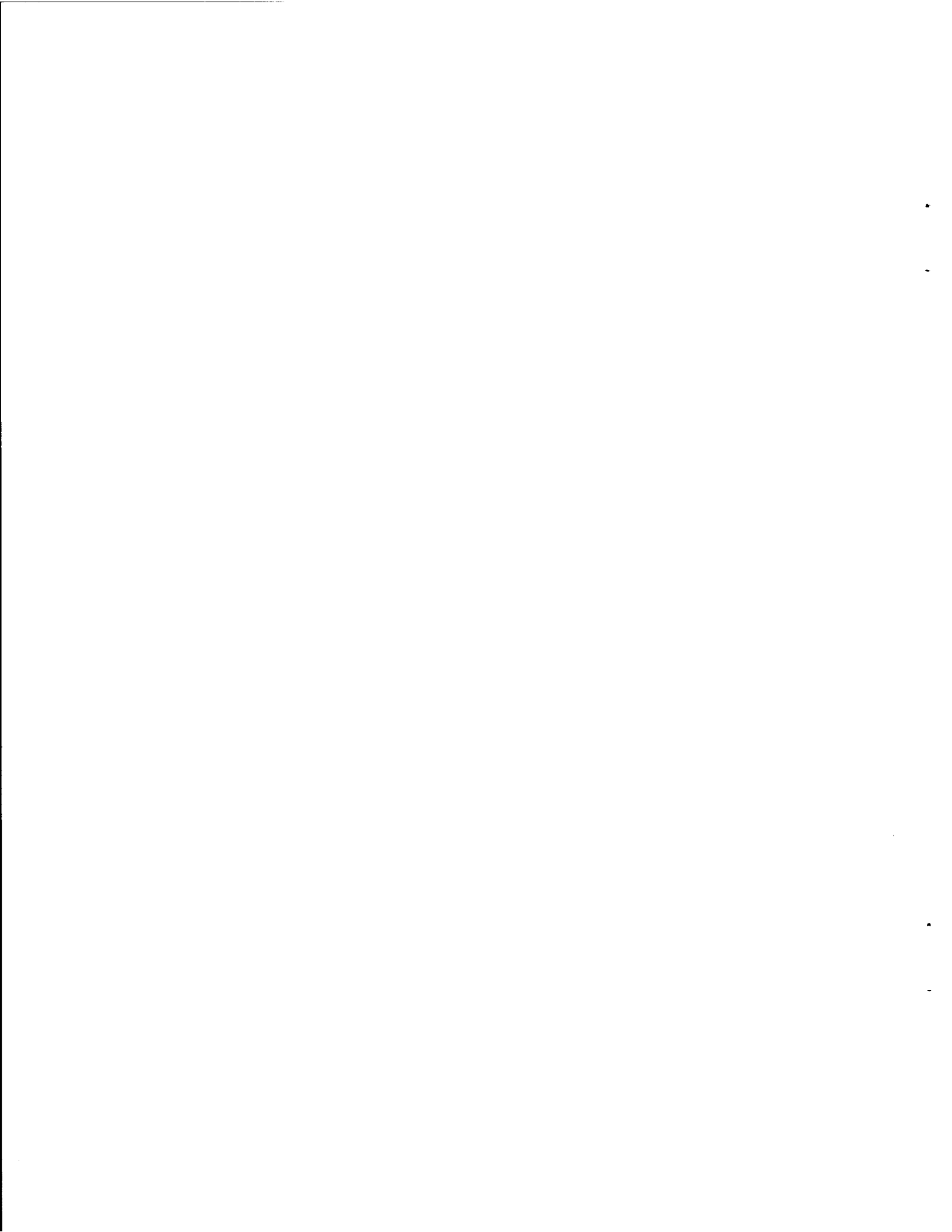
The Charles River begins its eighty mile journey in Hopkinton, Massachusetts, flowing into the Boston Harbor at the MDC Locks in Boston, Massachusetts. "The Charles River has twenty dams along its route, the newest one located at the mouth of the river in Boston." (Max Hall, The Charles -The Peoples River).

For the purpose of this study, Urban Harbors Institute has focused on the last several miles of the Charles River from Waltham to Boston. This stretch of the river is approximately eleven miles long. In the first portion of this eleven mile stretch, however, the river is impassable for vessels for over two miles between Waltham and Watertown square.

From the east side of Watertown square to Boston, a distance of nine miles, the river is passable although the depth, width and bridge clearances vary depending upon the location. As an example: in Watertown the width of the river is approximately 200 feet, in Cambridge by Harvard University the width of the river is approximately 400 feet, at Massachusetts Institute of Technology the river widens to approximately 2,000 feet.

Since there are no recorded depth soundings along this portion of the river, utilization of established paths through certain areas is necessary. The river is considered a navigable waterway, however, it is generally unmarked and vessels require shallow draft and must operate at low speed.

There are seven communities along this section of the river, three of which, Waltham, Newton and Watertown, generate the majority of the commuter market that would possibly utilize water transportation. Two of the communities, Cambridge and Boston, will support the majority of the destinations that might be proposed for potential commuters using the river.



The Charles supports a great deal of athletic and recreational activity during eight to nine months of the year. Both public and institutionally supported boat houses and docking floats are placed along both sides. Each major university - Harvard, MIT, BU, BC, Emerson and Northeastern - utilizes the river for student and alumni recreation and to train its rowing teams. Public sailing facilities, yacht clubs, a privately operated dinner and excursion boat operator, recreational rowing, marinas, the Hatch Shell, a number of Hotels and Commercial buildings and shopping areas such as Cambridge-side Galleria are also on or abut the river. During warmer months (March to November) the river and its banks represent a major activity center for Boston natives and visitors alike.

Relative to man made objects, there are four dams and seven bridges along this portion of the Charles. Two of the dams are in Waltham and two on the west side of Watertown Square making eastbound river passage from either of these locations, impossible.

From the east side of Watertown to Brighton and on to Boston, there are limiting restrictions. Beginning in Brighton and continuing to Boston there are seven bridges that offer height restrictions limiting the size of the vessel.

#### **4.1.3. Commuter Market Description**

The segment of the market that would potentially support a ferry service along the Charles River consists primarily of customers living in suburban areas west of Boston that are no more than 15 minutes from the proposed ferry terminal locations along the Charles. The largest portion of this market presently commutes to and from work to either Boston or specific points in Cambridge from the suburban communities of Newton, Waltham, and Watertown.

In addition, potential markets may also exist with people wishing to utilize public transportation to and from the various educational, shopping or hotel establishments lining the Charles River in an area between these suburban centers and the Cambridge/Boston areas.

The combined demographics of the three suburban areas that will generate most of the commuting market to Cambridge and Boston, indicate that approximately one quarter of the total population of 181,000 commutes to the Cambridge or Boston area.

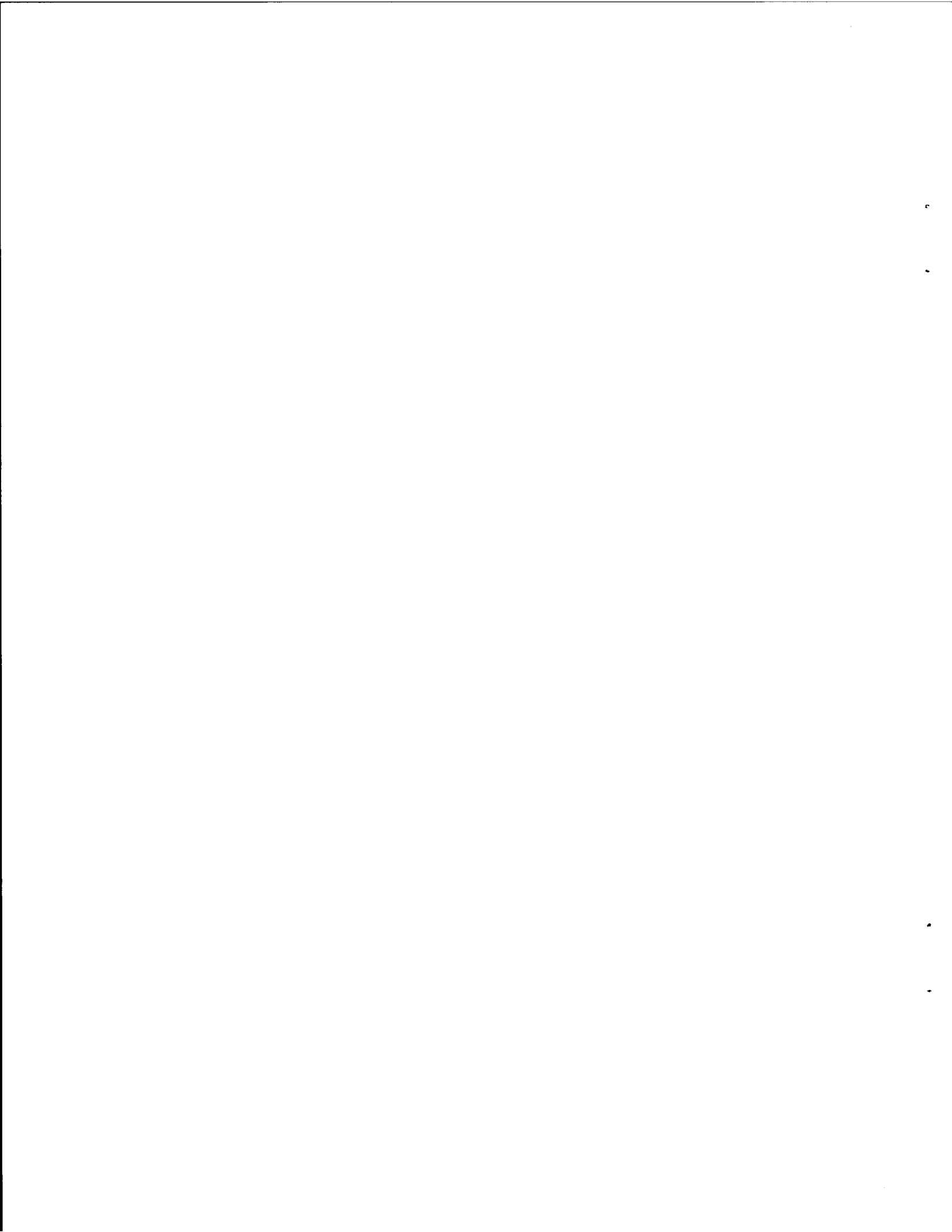
#### **COMBINED MARKET DEMOGRAPHICS NEWTON, WALTHAM, WATERTOWN**

<b>Population</b>	<b>Median Age</b>	<b>Median Income</b>	<b>Percent Commuting</b>	<b>Percent Using Public Transport</b>
181,500	36.5	\$36,217	23.7%	10.2%

fig 4.1

#### **4.1.3.1 WALTHAM**

The population of Waltham is 58,200; the median age is 35.2, while the median income is \$33,350. (CACI 1989; Fairfax Virginia). It is estimated that 5.7% of this community uses public transportation to commute to work on a daily basis (MBTA Blue Book).





#### **4.1.3.2**      WATERTOWN

The population of Watertown is 35,300; with a median age of 38 and a median income of \$34,150. It is estimated that approximately 16.3% of Watertown's commuters take public transportation.

#### **4.1.3.3.**      NEWTON

The population of Newton is 88,000. The median age is 36.5 and the median income is \$40,000. It is estimated that approximately 11.6% of Newton commuters utilize public transportation.

#### **4.1.4.**      Commercial Market Description

There are a number of residential, educational, industrial and institutional activities along both sides of the Charles River basin area including: hotels, universities, software corporations, office complexes, shopping malls and hospitals. Since these residences and businesses are so close to the river, many of their population and employees could take advantage of a commuter ferry system.

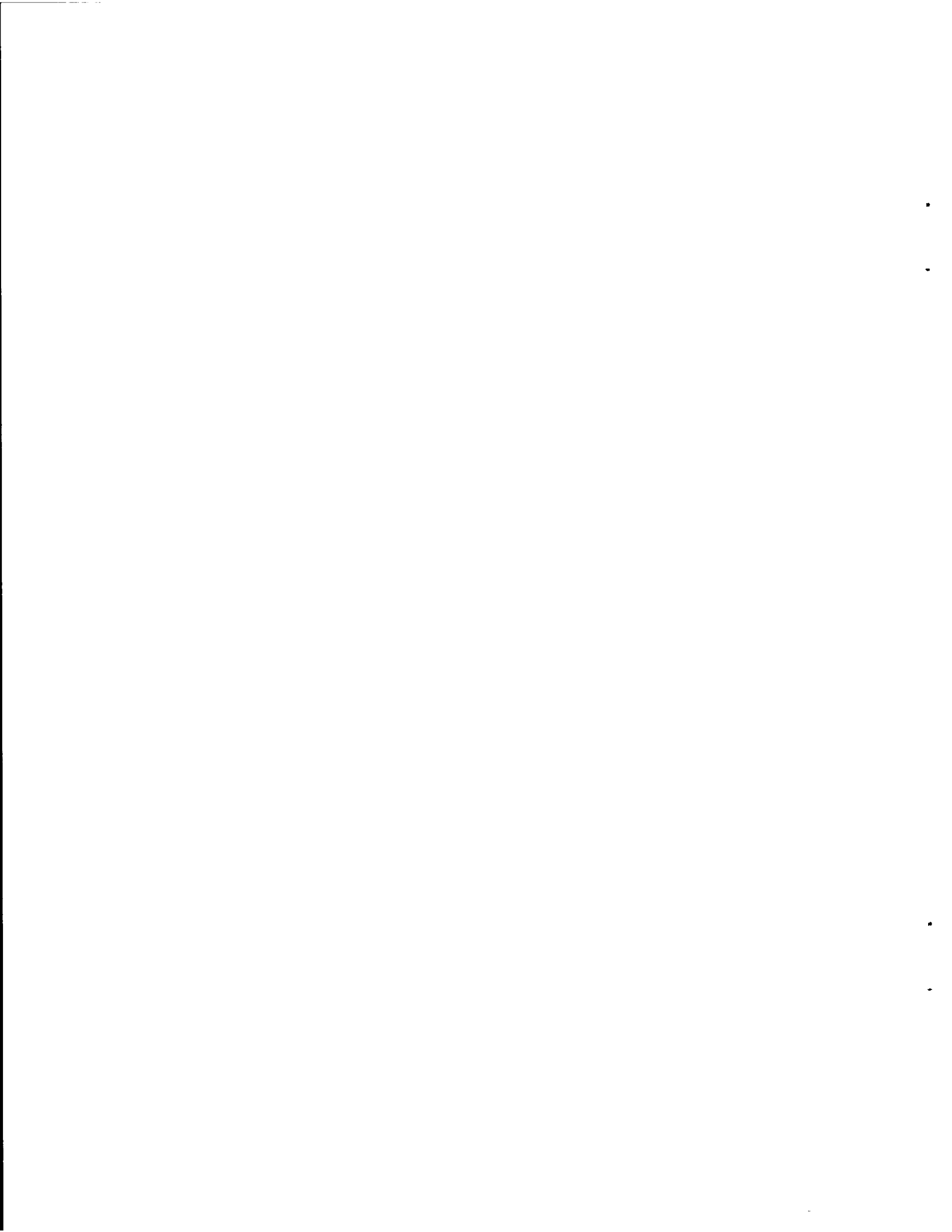
Polaroid Corporation, on Memorial Drive, indicates that it has 20 employees that regularly utilize a form of public transportation. The remaining employees utilize their private automobile

There are medical facilities in Boston that are very close to the Charles River. Massachusetts General Hospital and Massachusetts Eye and Ear are in close proximity to each other and within easy walking distance of the Charles. The commuter staff at Massachusetts General Hospital expressed a great deal of interest in a commuter ferry or, in fact, any means of public transportation that would help the 20,000 people who visit the hospital every day.

A commuter ferry, however, may not be an alternative for the employees of the hospital because of scheduling constraints. It may however, be helpful for those who may be able to coordinate a commuter schedule.

There are a number of residential complexes along the river, however, at the end of both Storrow Drive and Memorial Drive, there are two large communities which may patronize a waterborne system moving up and down the river. Charles River Park Apartments, which is a combination of 2,200 rental units and privately owned condo units houses approximately 5,000 residents.

There are several universities in proximity to the Charles River. They are Massachusetts Institute of Technology, Boston University, and Harvard University. These are boarding schools; with a combined student population of 55,238. These universities also employ a large number of people. Of the three schools listed they employ a combined total of 4,034 people from the Waltham, Watertown and Newton areas.



There are five hotels near the Charles River; The Royal Sonesta Hotel, The Hyatt Regency Hotel, Howard Johnsons Hotel, Guest Quarters Suite Hotel, and the Days Inn. In combination these hotels have 1,497 guests rooms. On a yearly basis their occupancy rate is approximately 70 to 75%. In September 1993 a meeting was held with the General Managers of these five hotels regarding water transportation. The outcome was that there is a definite interest among these people for a form of water transportation on the Charles River. They seemed to indicate that for their purposes, however, water taxi service criss crossing the Charles River would be preferred.

The science museum is also located on the Charles River in Boston. The museum attracts many visitors yearly. From May 1, 1992 through April 30, 1993, the museum had over 1.6 m (one million six hundred thousand) visitors. The museum employs approximately 300 people. There is a docking site located behind the Science Museum that is utilized by the Charles Riverboat Company

## **4.2 LAND BASED COMMUTING TO BOSTON AND CAMBRIDGE**

### **4.2.1 General**

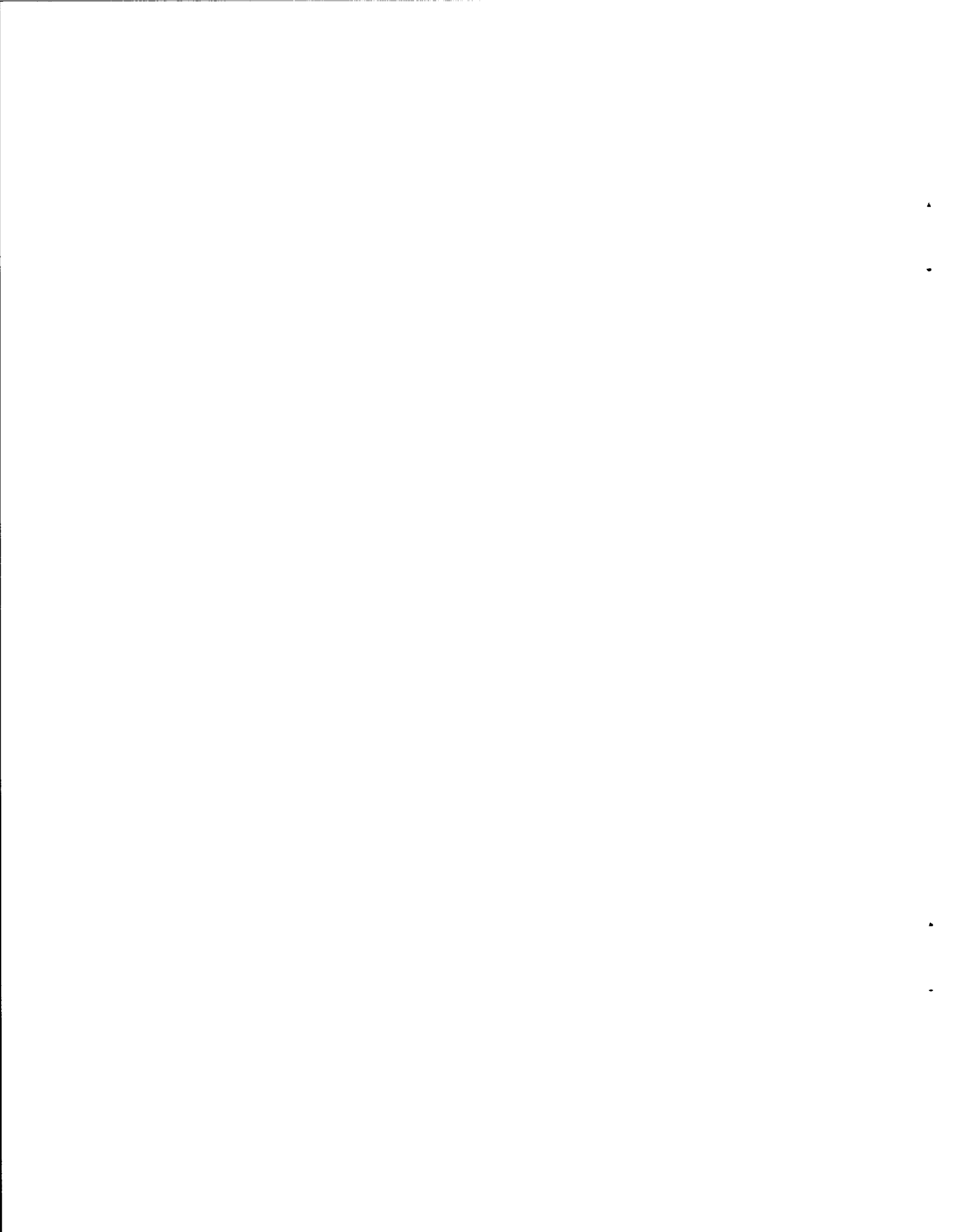
The commuting system in Boston is well developed. There are a number of modes of transport available to persons who commute to Boston and Cambridge on a daily basis. From Newton, Waltham and Watertown these include traveling by automobile as well as by bus, light rail and commuter rail. From Watertown, the only public transport available is bus service.

The majority of the commuters from these communities travel to work via automobile, however, a representative number utilize public transportation. Even though the commute from the West into Boston and Cambridge is generally accepted as the easiest of the three major automotive commuting accesses, the connection to the Central Artery (the route soon to undergo major construction) and the inevitable vehicular back-up during the busy commuting periods (due to this congestion) will make it difficult. The progress of the twenty year project has reached a stage where work on the major sections is about to begin. This will eventually result in a change in some area commuting habits, and of a percentage but not all of the staunchest auto commuters will revert to public transportation.

#### **4.2.1.1 Waltham**

The 1990 U.S. Census tabulates the daily commuting habits of Waltham citizens traveling to Boston, as follows: 2,225 traveling alone by car, 369 traveling by car with one passenger, 25 carpooling with two passengers, 4 carpooling with 3 people, 8 vanpooling with 8 people, 589 commuting by bus, 24 by streetcar, 242 by subway, 139 by commuter rail, 12 by taxi, 177 walked, and 5 used other means.

The breakdown of commuters traveling from Waltham to their jobs in Cambridge on a daily basis shows: 1,309 traveling alone by car, 82 carpooling with one other person, 6 carpooling with 2 other people, 8 vanpooling with 10 people, 97 using the MBTA bus



## SINGLE DAY, ONEWAY COMMUTER CENSUS

## BOSTON

COMMUNITY	AUTO ONE PERSON	CAR POOL (CPL) 2 PERSONS (PER)	CPL 3 PER	CPL 4 PER	CPL 5 PER	CPL 6 PER	CPL 8 PER	CPL 10 PER	BUS	STREET CAR	SUBWAY	RAIL	TAXI	BIKE	WALK	OTHER	TOTAL
WALTHAM	2,225	369	25	4			8		589	24	242	139	12			177	3,814
WATERTOWN	2,215	397	81	29	17	10			1,393	79	288	21	9	34	20		4,593
NEWTON	7,785	1,160	74	11	41				1,923	899	7,444	429	13	56	152	25	20,012
TOTALS	12,225	1,926	180	44	58	10	8		3,905	1,002	7,974	589	34	90	172	202	28,419

## CAMBRIDGE

COMMUNITY	AUTO ONE PERSON	CARPOOL (CPL) 2 PERSONS (PER)	CPL 3 PER	CPL 4 PER	CPL 5 PER	CPL 6 PER	CPL 8 PER	CPL 10 PER	BUS	STREET CAR	SUBWAY	RAIL	TAXI	BIKE	WALK	OTHER	TOTAL
WALTHAM	1,309	82	6					10	97		87	12		11	9		1,623
WATERTOWN	1,662	266		7					4,560	18	95		23	23	45	7	6,596
NEWTON	2,237	171	44						157	75	92	26		23	29		2,853
TOTALS	5,108	508	50	7				10	4,814	93	274	37	23	57	83	7	11,071

Bq 4.2

**4.2.1.2** Watertown

The numbers of people who commute to Boston from Watertown on a daily basis, using similar modes of transportation includes: 2,215 travel alone by automobile, 397 travel with one passenger, 81 traveled in a carpool with two others, 29 carpooled with three others, 17 vanpooled with five, 10 vanpooled with six, 1,393 took the MBTA bus, 79 took the streetcar, 288 took the subway, 21 took commuter rail, 9 took a taxi, 34 rode their bike, and 20 walked.

The breakdown of those people who commute daily from Watertown to Cambridge is: 1,662 travel alone via their car, 266 carpool of two, 7 carpool of four, 4,560 take the bus, 18 take the streetcar, 95 take the subway, 23 take a taxi, 23 ride a bike, 45 walk, 7 take other means of travel.

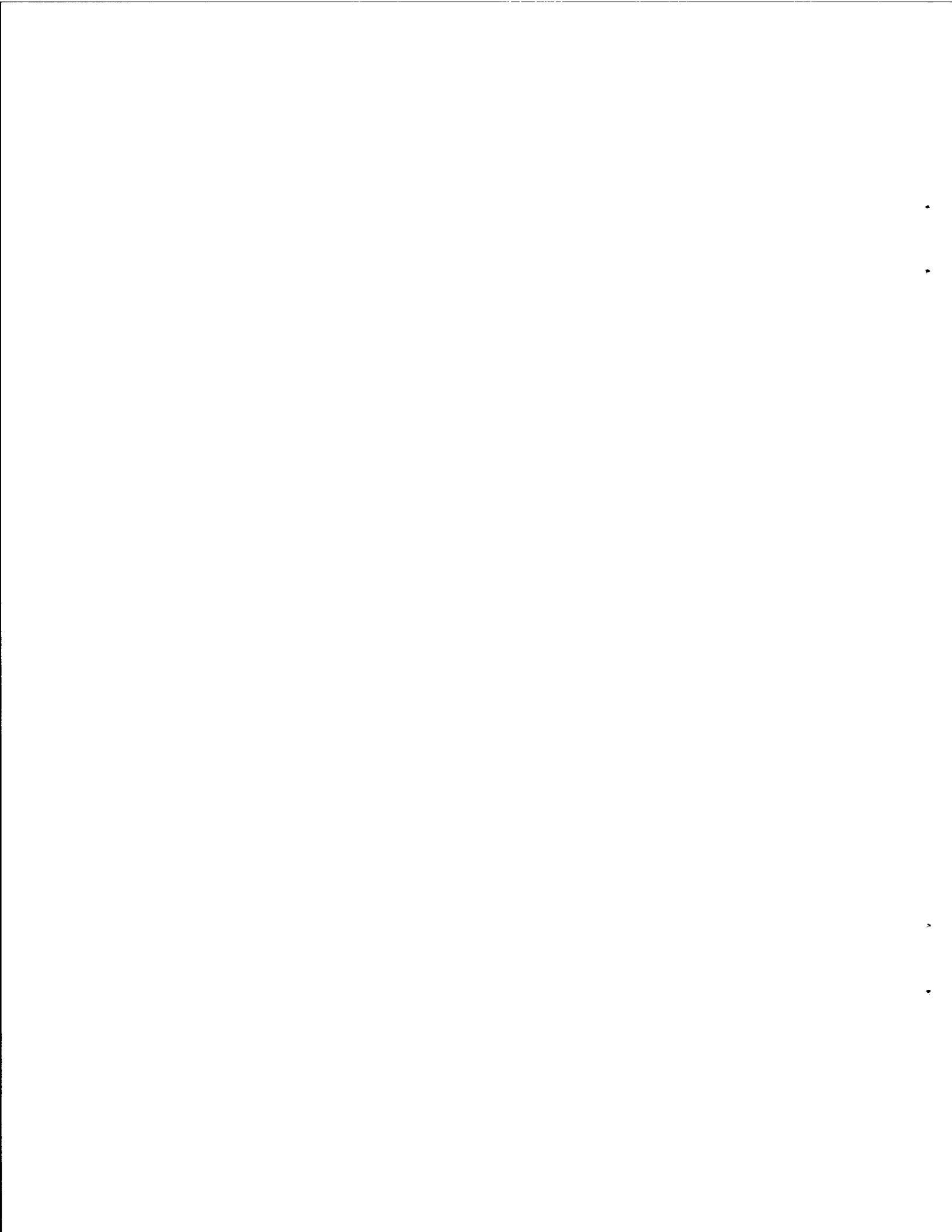
**4.2.1.3** Newton

The number of people who commute to Boston from Newton using the following modes of transportation include: 7,785 travel alone by automobile, 1,160 carpool with one other, 74 carpool with 2 others, 11 carpooled with three others, 41 carpooled with 4 others, 1,923 take the bus, 899 take the streetcar, 7,444 take the subway, 429 take commuter rail, 13 take a taxi, 56 ride bikes, 152 walk, 25 use other means of travel.

The breakdown of the commuters who travel to Cambridge daily from Newton is as follows: 2,237 travel alone via automobile, 171 carpooled with one other, 44 carpooled with 2 others, 157 take the bus, 75 take the streetcar, 92 take the subway, 26 take the commuter rail, 23 ride a bike, 29 walk.

**4.2.2** Automobile Travel

The most popular way to commute is via automobile. There are a number of main routes that people utilize to Boston or Cambridge.



#### **4.2.2.1**      Storrow Drive

Storrow Drive is a four lane highway that runs alongside the Charles River on the Boston side. It can be accessed from the west by taking Nonantum Road in Watertown to Soldiers Field Road, which then becomes Storrow Drive or by exiting the Massachusetts Turnpike at the Alston/Cambridge exit.

The approximate transit time along the Soldiers Field Road/Storrow Drive route is twenty minutes, beginning in Watertown and ending in various sections of Boston, providing there are no traffic delays. If there are any problems on Storrow Drive, a serious back-up quickly results. There are no breakdown lanes and limited exits. Storrow Drive ultimately links to a major access ramp to the S.E. Expressway, the major artery that is about to begin complete redesign and renovation. The ride from Newton Corner to Boston is approximately 20 minutes; from Waltham, approximately 30 minutes and from Watertown approximately 15 to 20 minutes.

An alternate route to both Storrow Drive and Memorial Drive, is the Massachusetts Turnpike, entering at Newton Corner and exiting at the Allston/Brighton exit. This exit connects directly to limited access roadways heading both east to Boston and west to Cambridge.

#### **4.2.2.2**      Memorial Drive in Cambridge

Memorial Drive runs parallel to the Charles River and Storrow Drive on the Cambridge side of the river and dumps traffic into Cambridge. This road can be accessed by taking Greenough Boulevard in Watertown, which leads to Memorial Drive. Although it is similar in distance to Storrow Drive, it is not restricted to limited access so the travel time is normally 20 minutes.

#### **4.2.2.3**      Massachusetts Turnpike

Commuters can also access both Storrow and Memorial Drives via the Alston/Cambridge exit from the turnpike.

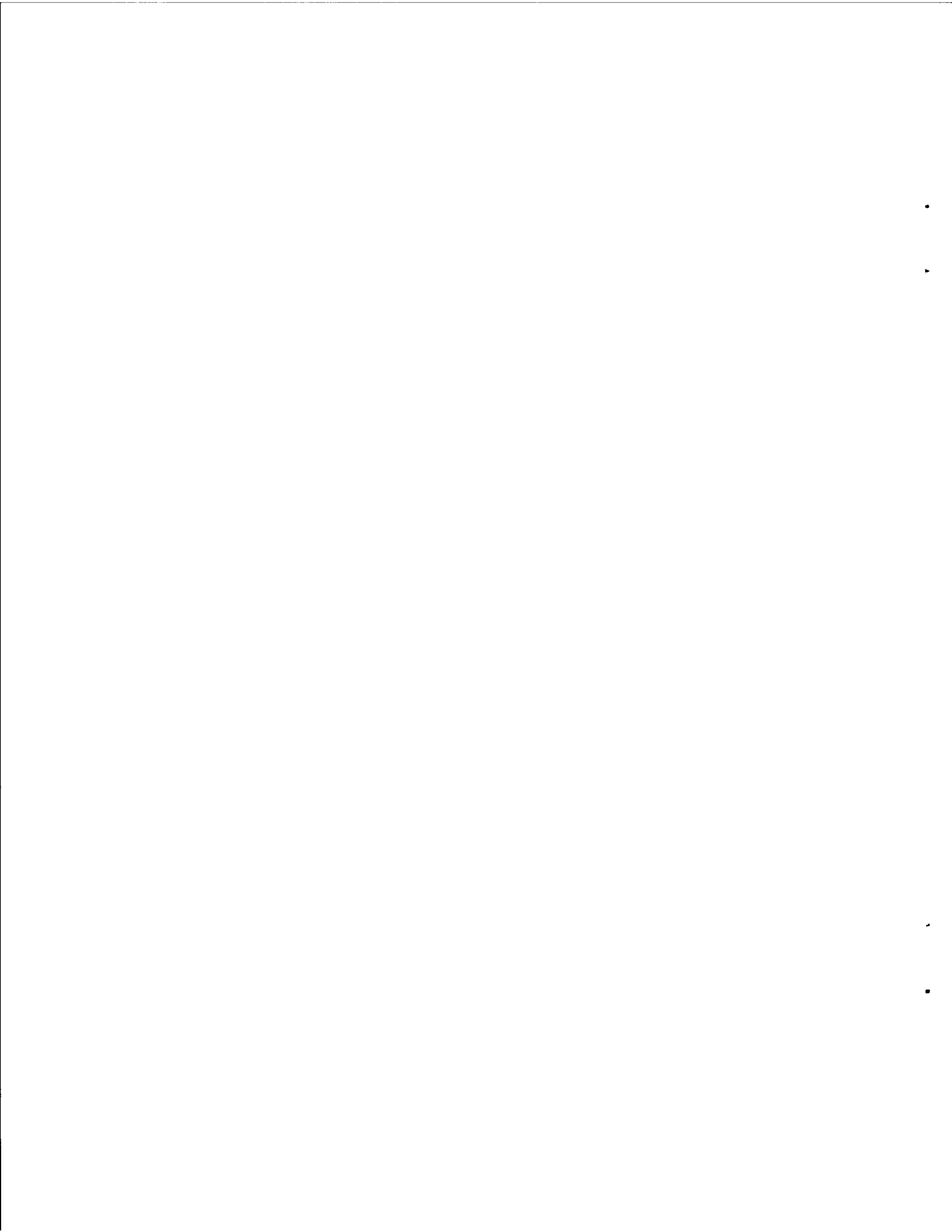
The Massachusetts Turnpike can also be utilized as a direct transit artery for the private automobile to downtown Boston. This route bypasses all the river roads, however, there is a toll charge of fifty cents at the Alston toll booth. Commuters can exit at two points after the Alston booth to access Boston and can reach a variety of destinations within the City of Boston from both of these locations.

### **4.2.3**      Public Transportation

#### **4.2.3.1**      Subway

Public transportation from the Western suburbs is readily available as an alternative to driving an automobile into the city. The Massachusetts Bay Transportation Authority (MBTA) operates four major subway routes, the Orange Line, the Blue Line, the Red Line and the Green Line. The Blue, Red and Orange lines are connecting lines to the Green Line which stretches from the Riverside park and Ride lot in Newton to Government Center in Boston. A connection at Government Center will take commuters on to North Station, the Science Museum or Lechmere

Connections can also be accessed at Government Center to the Blue Line and from the Park Street station for the Red Line. (See appendix number 1 for map of MBTA stops). From Park Street, the Orange Line can be accessed at Downtown Crossing, a five minute walk or a stop on the Red Line.





The ride on the Green Line from Riverside in Newton to Lechmere will take approximately thirty five minutes. The Green Line departs every five minutes from Riverside during the commuter rush hour and is routed through Boston on to the Cambridge side of the Charles River.

#### **4.2.3.2**      Commuter Rail

Commuter rail, is the second form of public rail transportation available to Waltham and Newton commuters. Depending upon where in Boston the commuter wishes to go, there are two systems available. From Waltham, commuters may board the train at either the Brandeis/Roberts stop or the Carter Street stop. Trip time from these stops to North Station in Boston is approximately twenty-five to thirty minutes. During rush or peak traveling times, in the morning and evening hours, there are five scheduled departure times. The morning departures from Waltham are: 6:52, 7:38, 8:01, 8:27, and 8:57 am. In the afternoon, departures from Boston are: 4:00, 4:50, 5:20, 5:30 and 6:15 pm.

From Newton, Commuter rail originates in Framingham. From the Newton area to Boston, it runs parallel to the Turnpike for much of the journey, stopping first in Boston's Back Bay and then terminating at South Station. This train will make various stops along the way including stops in Auburndale, West Newton, and Newtonville sections of Newton.

The times of the stops in **Auburndale** and the arrival at South Station are:

Leaves	6:39 A.M.	Arrives	7:02 A.M.
	7:25 A.M.		7:48 A.M.
	7:56 A.M.		8:49 A.M.
	8:59 A.M.		9:22 A.M.

The fare one way from **Auburndale** is \$2.25. A monthly pass is \$72.00.

The times of the stops in **West Newton** and the arrival at South Station are:

Leaves	6:42 A.M.	Arrives	7:02 A.M.
	7:28 A.M.		7:48 A.M.
	7:59 A.M.		8:20 A.M.
	8:29 A.M.		8:49 A.M.
	9:02 A.M.		9:22 A.M.

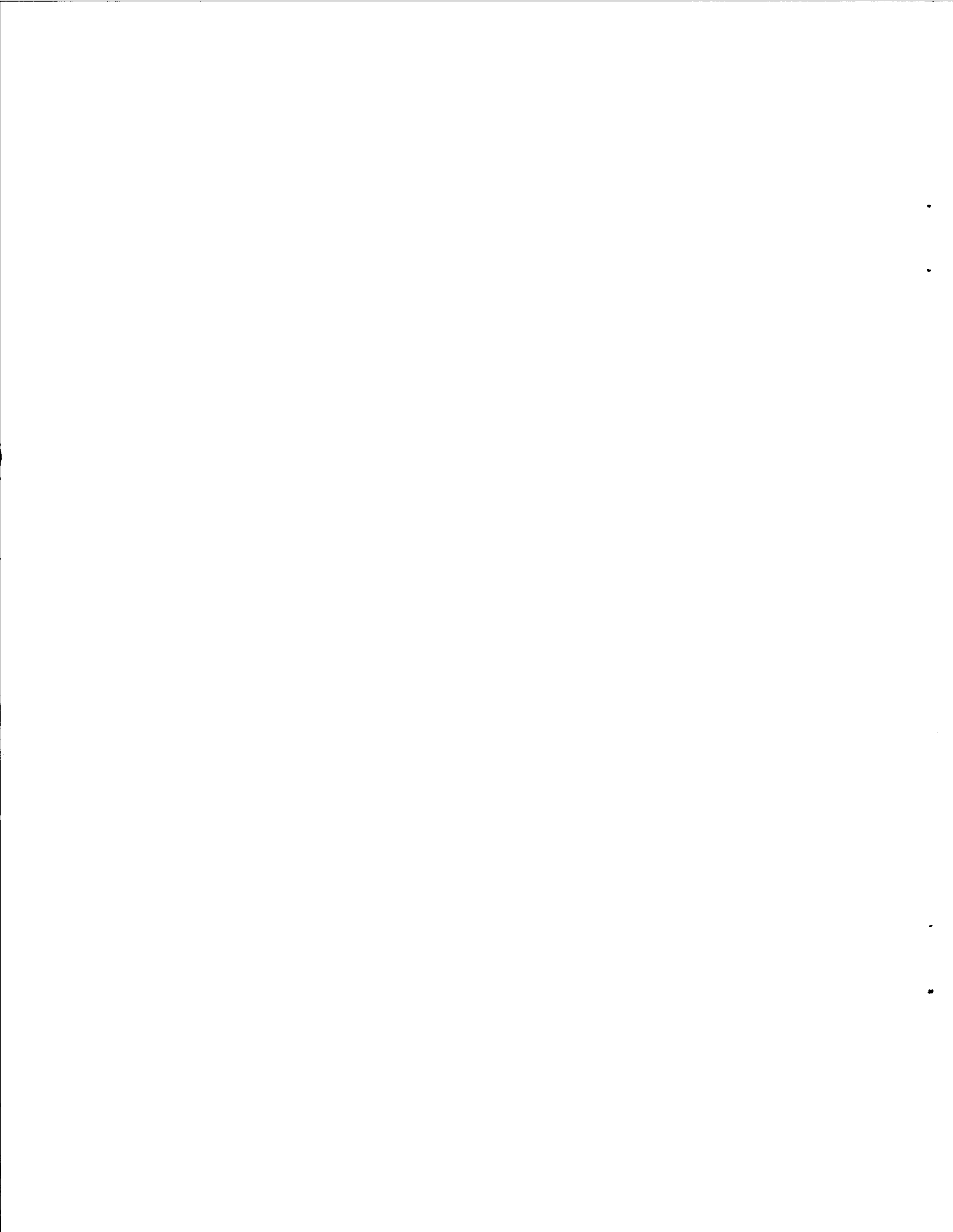
The fare one way from **West Newton** is \$2.25. A monthly pass is \$72.00.

The times of the stops from **Newtonville** and the arrival at South Station are:

Leaves	6:45 A.M.	Arrives	7:02 A.M.
	7:32 A.M.		7:48 A.M.
	8:03 A.M.		8:20 A.M.
	8:32 A.M.		8:49 A.M.
	9:05 A.M.		9:22 A.M.

The fare one way from Newtonville is \$2.00. A monthly pass is \$64.00.

The trains leaving South Station in the afternoon commuting hours going back out to the suburbs are as follows: 4:30 P.M., 5:00 P.M., 5:30 P.M., 6:05 P.M. and 6:55 P.M.



### **4.2.3.3 Bus**

The MBTA also operates bus service from Waltham, Watertown, and Newton to both Boston and Cambridge. The express bus (Number 305) leaves Waltham's Central Square destined for Federal and Franklin Streets in downtown Boston. During the morning rush hour the bus leaves every six to eight minutes. In the afternoon rush hour the bus leaves Boston every eight minutes. Travel time for the morning commute is approximately 29 minutes, however, for the afternoon commute this changes to about 42 minutes.

This bus also serves the Newton Corner stop. Travel time from this stop to downtown Boston is approximately 19 minutes in the morning. The route from Boston to Newton Corner is about 32 minutes during the late afternoon commute.

There is also an express bus that stops in both Watertown Square and Newton Corner. This bus utilizes the Massachusetts Turnpike to and from Boston. From 7:00 A.M. to 9:00 A.M. buses depart from these two stops approximately every ten minutes.

The travel time from Watertown to Boston is approximately fourteen minutes. From Newton Corner the travel time is approximately eleven minutes. For the return trip in the afternoon, these buses run every ten minutes or less, while the traveling time also increases to twenty-four and twenty-seven minutes respectively.

In the city of Waltham there is an express bus that leaves Central Square, with a stop at the corner of Commonwealth Avenue and Lexington Streets in West Newton before continuing to downtown Boston. These buses will leave approximately every 10 minutes both during the A.M. and P.M. commuter hours. There are other buses that leave Waltham that will stop in Watertown Square or Newton Corner to make connections to other parts of Boston as well as Cambridge.

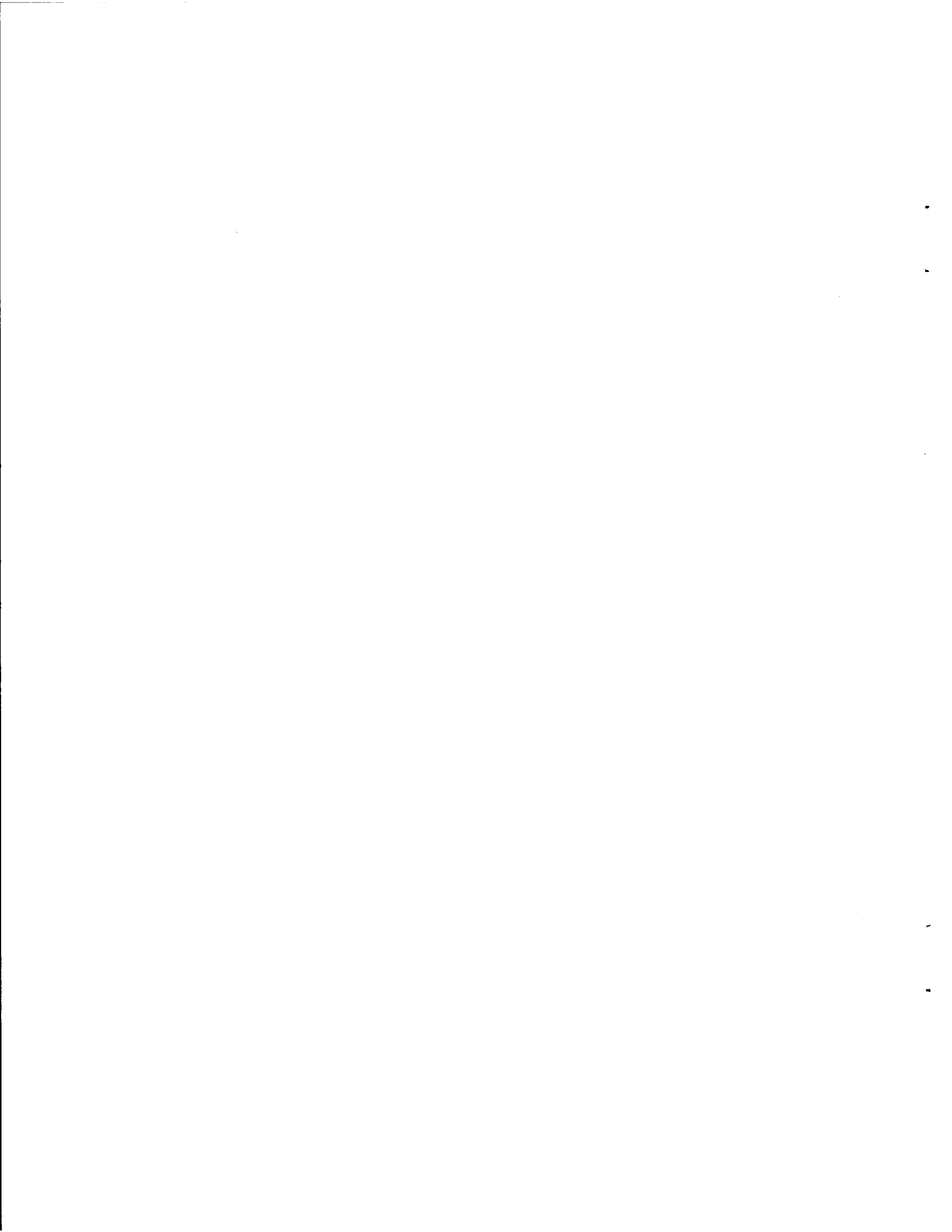
Watertown Square is the central hub for buses leading to various destinations from Watertown. Commuters converge to this area to catch these buses. Among the many buses that depart from this location, at least two serve commuters to the Boston area: #302 to Copley Square via Newton Corner and the Massachusetts Turnpike and #304 to Downtown Boston from Watertown Square and Newton Corner via the Massachusetts Turnpike. From Watertown Square and Newton Corner #57 goes directly to Kenmore Square. From Watertown there also are buses that go to Harvard Square in Cambridge - bus #71, and a bus to Central Square in Cambridge - bus #70.

On Washington Street at Newton Corner split, two bus hubs serve commuters to various destinations including Boston and Cambridge. One side of the Washington Street split seems to serve buses going to destinations in all directions. On the other side of Washington Street, a stop located shortly before the entrance to the Massachusetts Turnpike, serves as the pick-up and drop-off for express bus service to the Downtown Boston area.

## **4.3 OPERATING ELEMENTS CONSIDERED IMPORTANT BY COMMUTERS**

### **4.3.1 General**

The two questions that must be answered relative to considering the feasibility of a ferry service along the Charles River into the Boston/Cambridge area include: first, the elements commuters consider important in the decision of choosing their mode of public transport and how the Charles River ferry would satisfy those elements and second, the physical elements that will be relative to establishing ferry transport along the Charles. These elements are critical to establishing a ferry service.



Studies concentrating on commuting indicate that the habits of commuters vary from place to place depending upon the length and type of trip they must undergo. Utilization of the automobile in some areas is a must since public transport does not reach out to some rural communities. In this case, and only in this case, commuters will drive directly to work or drive long distances and connect with some form of public transportation. The choice of connecting public transport seems to be a matter of what one is used to, rather than what may be logical. The commuter's decision to stay in the automobile or transfer to public transit may also be based upon one or more of the elements of cost, time, schedule, convenience, comfort and weather.

In other areas, driving to work may be the preferred mode of transport because: traffic congestion is marginal, commuting time is acceptable, the cost of driving is manageable, the convenience based upon the manageability of the above two is within range and the comfort is there. In an urban center, commuters will utilize a number of different modes to commute, the majority using public transportation. In utilizing bus, train or subway, they may well chose the mode best suited to their origin and destination requirements.

Throughout the history of waterborne commuting, the most successful ferry systems are those that are essential, crossing bodies of water providing "life line" service and a link in the transportation chain. Those that have run parallel to land side systems, considered optional services, have not fared quite as well. Early on, prior to bridges and tunnels, the cross water systems were the only way to get from one side to the other without a long trip around.

The recent renaissance of ferry transportation, regardless of whether it is cross water or parallel to land, has taken on a different mission. Ferry systems, developing over the last fifteen to twenty years have done so out of social consciousness, supplementing other forms of transport and alternate forms of access. Ferries now compete head to head with established land side forms of transport and manmade linkages parallel to their route. Commuters are offered more choices and have become more sophisticated in their selection process.

Commuters have indicated that there are five major elements that impact a decision on what type or mix of types of transportation they will chose to travel to work:

#### **4.3.1.1**      Cost

The comparison of automobile costs (operating, tolls, parking) versus the round trip cost of public transport (fare, parking & intermodal connection) or a comparison of costs of different forms of public transport.

#### **4.3.1.2**      Time

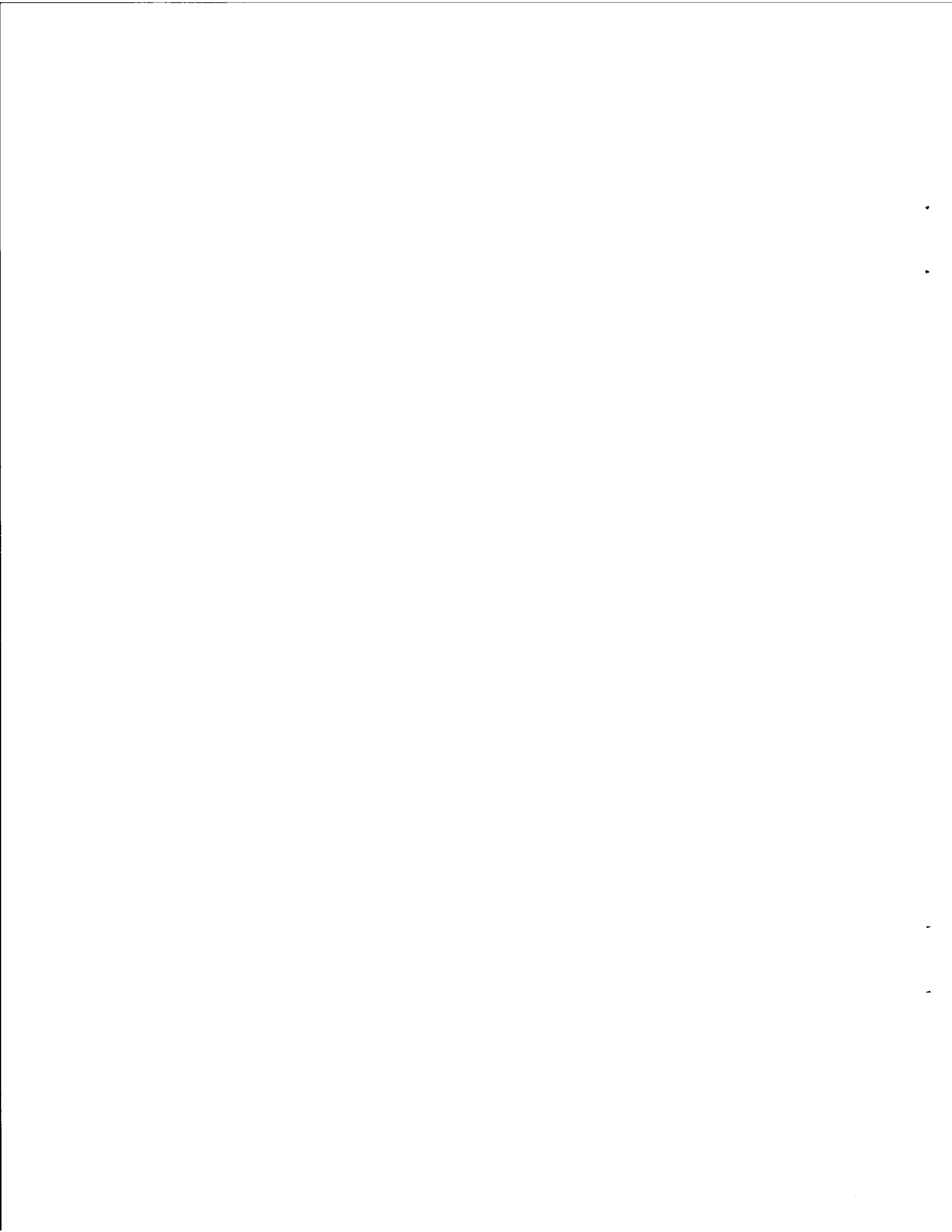
The total time involved in the commute, whether utilizing a private vehicle or walking/driving to a public transport connection, waiting for mass transportation and traveling to the destination.

#### **4.3.1.3**      Convenience/Reliability

Compatibility and frequency of their schedules with the transport mode and location of origin and destination points.

#### **4.3.1.4**      Comfort

Protection from the elements, availability of seating, personal safety, special amenities, enjoyable atmosphere.



#### 4.3.1.5 Special Enjoyment

The special enjoyment factor is related in large part to rail or ferry commuters. Personal attitudes for or against a particular mode of transport may also include psychological perceptions of the mode itself.

In a report entitled "Logan Airport/Boston Harbor Water Transportation Study" completed in June of 1988, the authors indicated that "The comparison of ferry transportation to rapid transit/commuter rail rather than to highway travel is most relevant, because the most likely market for ferry service to downtown Boston are travelers who would consider transit as an alternative to highway travel." In the instance of this report, the conclusions of commuters to take some form of public transport seems to be influenced by the high cost of parking and/or the greater speed of transit service during peak periods in the Boston location.

#### 4.3.2 Cost of the Boston Commute

##### 4.3.2.1. Overall Comparison

###### DAILY ONE WAY COST

COMMUNITY	AUTO	BUS	MBTA	COMMUTER RAIL
NEWTON	\$7.43	\$1.50	*\$3.13	\$2.25
WALTHAM	\$7.43	\$2.25	-	\$2.25
WATERTOWN	\$7.43	\$1.50	-	-

\* - Includes parking at Riverside Station

fig 4.3

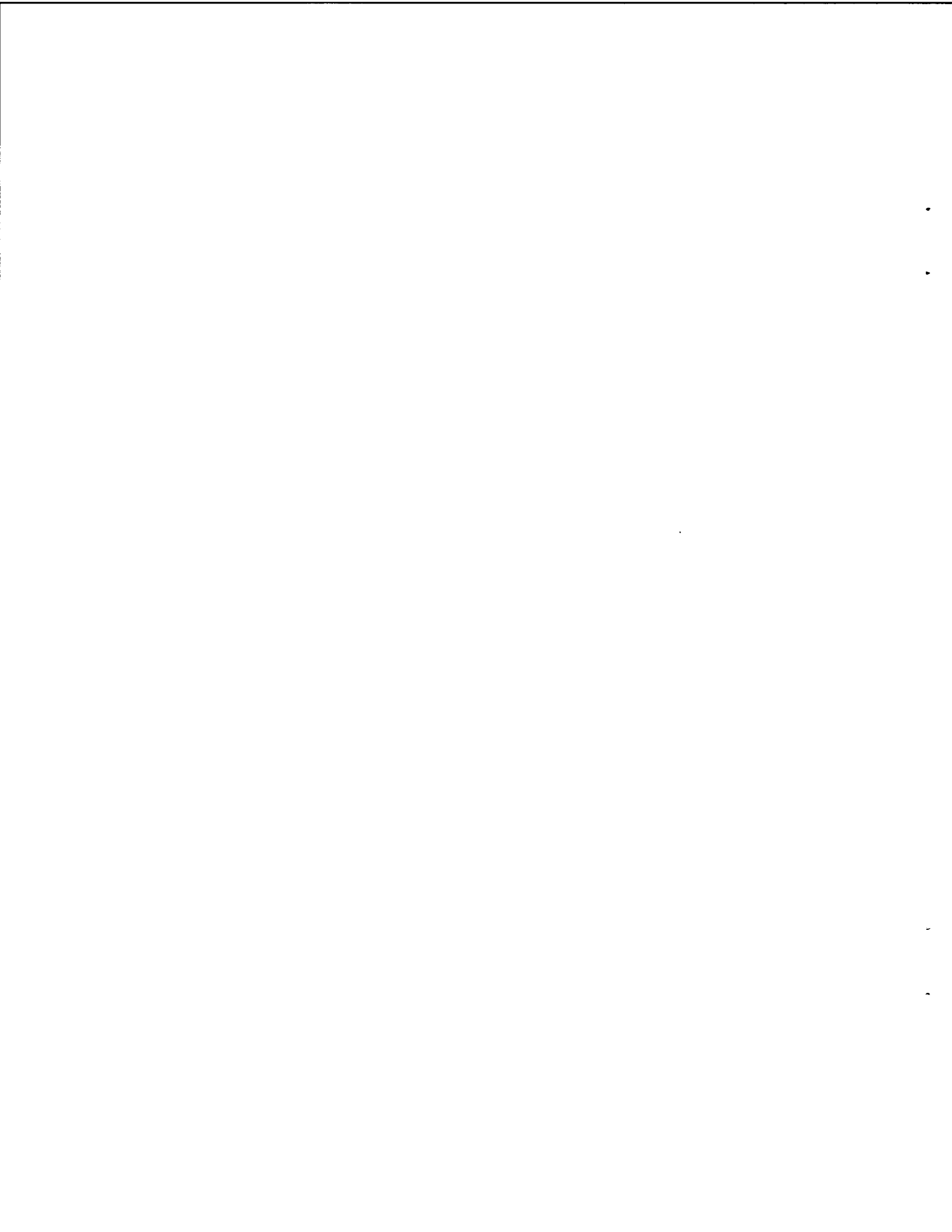
"The rough costs of automobile travel in the Boston area include: gasoline, oil, vehicle maintenance, insurance, license, taxes, depreciation, and finance charges". They were provided by AAA's "Your Driving Costs, 1992" and were based upon driving 30 round trip miles. For shorter routes, the incremental costs of commuting by automobile may be slightly higher.

##### 4.3.2.2. Automotive Costs

###### AUTOMOTIVE - WALTHAM, WATERTOWN & NEWTON TO BOSTON/CAMBRIDGE

<u>AUTOMOBILE</u>	<u>COST</u>
Drives alone	\$ 14.96/day
Drives alone	\$ 299.00/month
Carpool two people	\$ 7.48/day
Carpool two people	\$ 150.00/month
Carpool fourteen people	\$ 3.36/day
Carpool fourteen people	\$ 67.00/month

fig 4.4





**4.3.2.3**      MBTA Subway CostsMBTA - NEWTON TO BOSTON AND CAMBRIDGE

Green Line from Newton to Boston	\$ 2.00
Green Line from Boston to Newton	\$ .85
Parking at Riverside, Newton	\$ 2.25/day
Monthly Combo Pass	\$ 46.00
Monthly Combo Plus	\$ 48.00

fig 4.5

**4.3.2.4**      Commuter Rail CostsCOMMUTER RAIL - WALTHAM AND NEWTONVILLE TO BOSTON

<u>COMMUTER RAIL</u>	<u>COST</u>
From Waltham to North Station, Boston	\$ 2.25
From North Station, Boston, to Waltham	\$ 2.25
Monthly Pass Zone 2	\$72.00

fig 4.6

**4.3.2.5**      Bus CostsBUS - WATERTOWN, WALTHAM AND NEWTON TO CAMBRIDGE & BOSTON

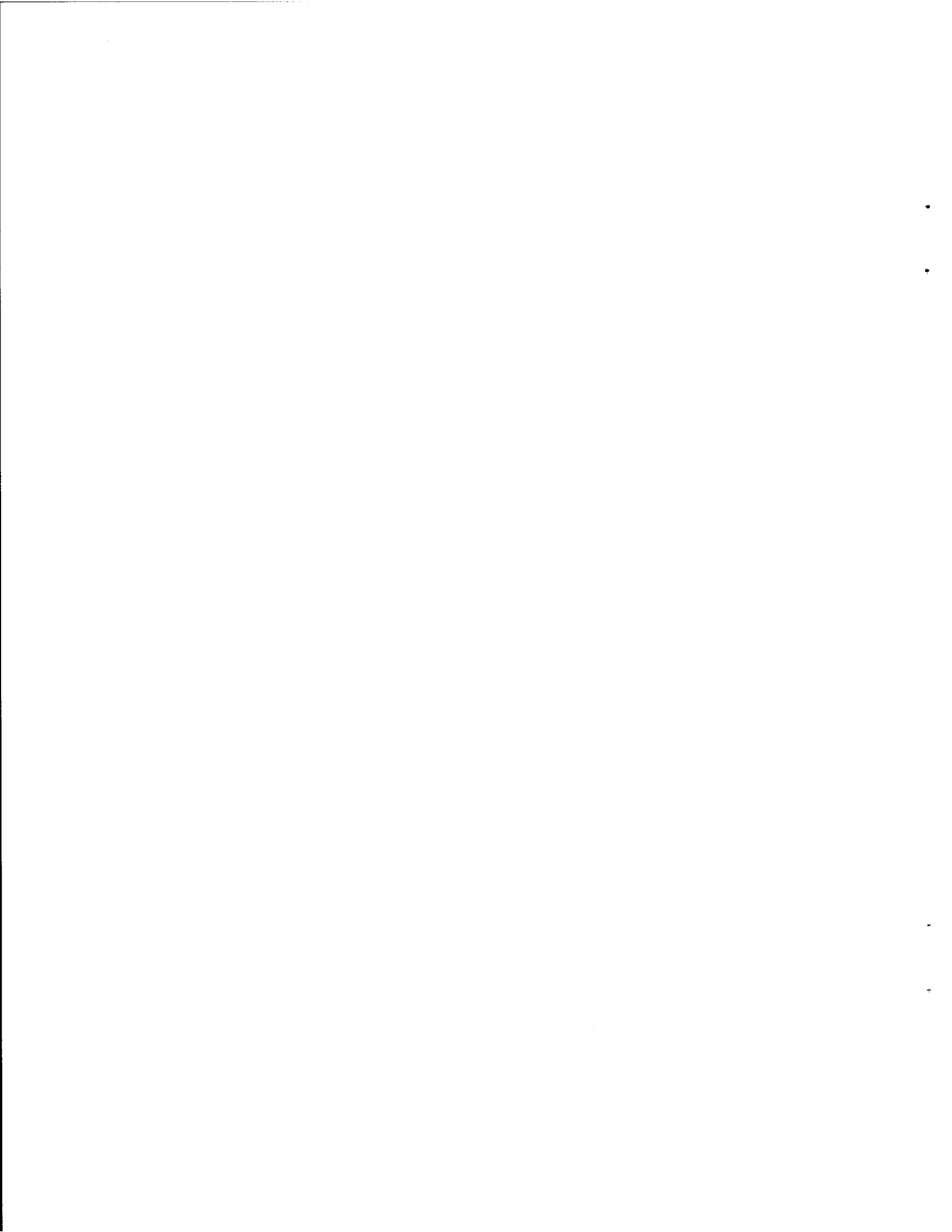
<u>BUSES</u>	<u>COST</u>
From Watertown Sq. to Harvard Sq.	\$ .60
monthly Pass	\$ 20.00
Express Bus from Watertown To Boston-Copley Sq	\$ 1.50
Monthly Pass	\$ 46.00
Express Bus from Newton Corner to Downtown Boston	\$ 1.50
Monthly Pass	\$ 46.00

fig 4.7

**4.3.3**      Length of Time for the Boston Commute**4.3.3.1**      General

The time element is one of the two most important in a decision to utilize one commuting mode over the other. Commuters from the Newton, Waltham, Watertown area are presently experiencing an automobile commute averaging 22 minutes each way. Public transportation averages 23.6 minutes inbound and slightly over 29 minutes on the return commute.

Commuter time is calculated from the point when the commuter enters the conveyance to the time he gets off (or out). The times for public transit depends upon which stops are utilized. In some instances, public transit is less time consuming than private automobile. Commuting time for auto, bus, commuter rail and subway ranges from 11 minutes by bus during the inbound commute from Watertown to Boston to 42 minutes from Waltham to Boston on the return commute.



#### 4.3.3.2 Time Comparison

##### COMPETITIVE ANALYSIS DAILY ONE WAY TIME

COMMUNITY	AUTO IN/OUT	BUS IN/OUT	MBTA	COMMUTER RAIL
NEWTON	20	19/32	35	23
WALTHAM	30	29/42	-	25/30
WATERTOWN	15	11/14	-	-

fig 4.8

#### 4.3.4 Convenience and Reliability

These two categories are non quantifiable. Commuters search for transportation that will provide them convenience. If convenience is the most important reason for their choosing one commuting mode over the other, their decision may include as example, driving a private automobile, despite a potential increase in their costs. In public transportation commuters look for compatible and frequent schedules and transit that will pick them up and drop them off in areas that are convenient to home and work locations.

Reports indicate that water commuters in other markets in the U.S. tend not to travel long distances to connect with ferry transport. They avoid trips in excess of fifteen to twenty minutes. In the same vein, commuters will look for an easy walk or connecting transit very near the ferry destination on the way to work. Parking is important to the ferry user at the point of origin.

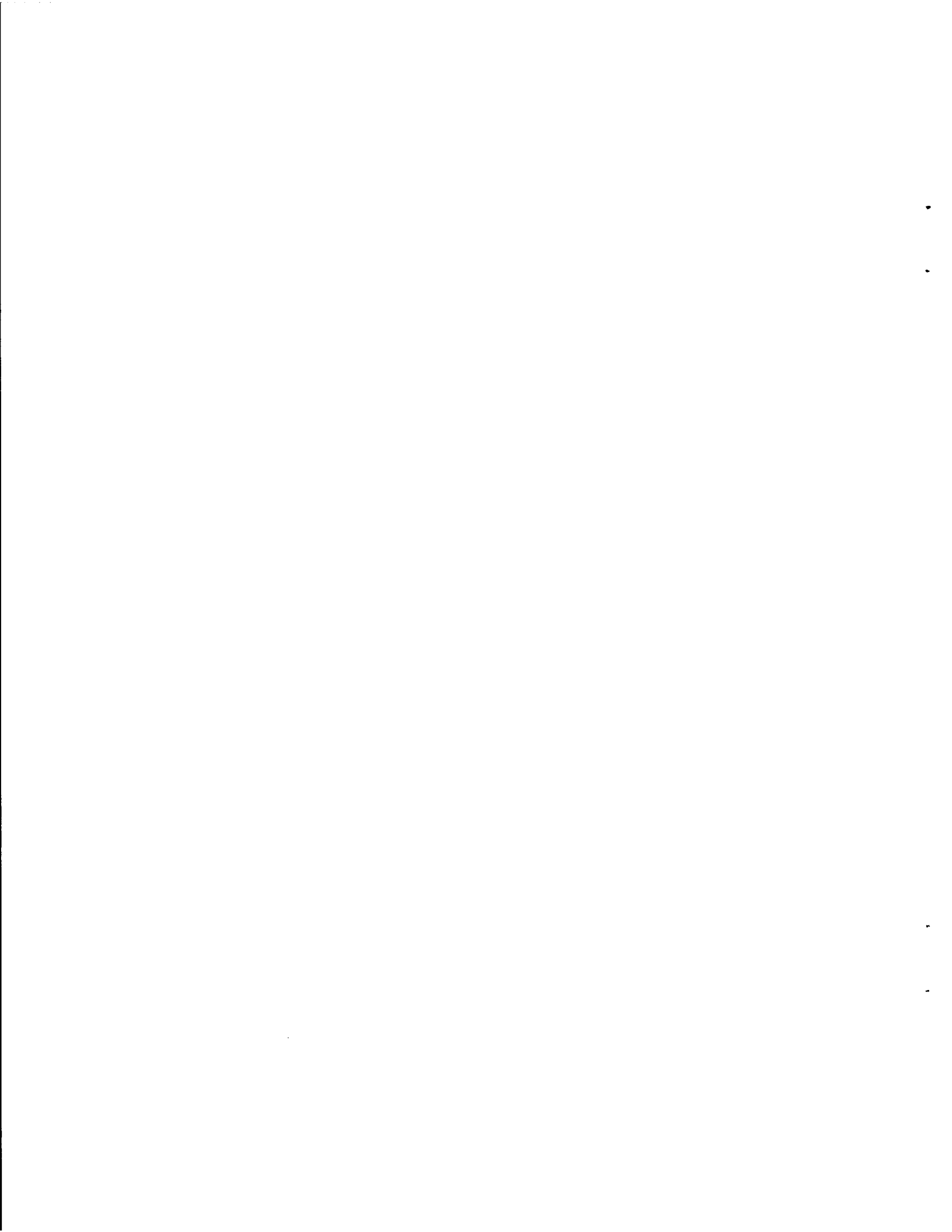
Reliability in a commuter service means that virtually every day, two times a day, service is available and begins and ends on time. Not all commuter systems can claim that they operate on time every day, however, the number of public commuter systems that do not operate everyday, regardless of the schedule, are few and far between. When a commuter chooses the mode of transportation he will utilize, he expects that it will take him to work and bring him home everyday, at approximately the time that he wishes.

#### 4.3.5 Comfort

The comfort elements that are important to the commuter, include: protection from the elements while waiting, (protection from rain, snow and wind, heated coverage during the cold), comfort inside the vehicle (climate control, smooth ride, low noise, available seating if the ride is long and personal safety (freedom from bodily harm), freedom from reckless or harmful driving operation of the vehicle.

#### 4.3.6 Special Enjoyment

The special enjoyment factor may be a combination of elements including: an unexplained preference for one mode over the other, the scenic aspects of the trip, special amenities such as the ability to relax, refreshments and a commuter social structure. These elements are difficult to explain or anticipate. They may not be a factor in all types of commuting, however, they are generally considered the benefits of water transport.



#### **4.4 COMMUTER MARKET**

##### **4.4.1 Market Survey**

###### **4.4.1.1 General**

The Urban Harbors Institute conducted a limited survey of three groups of people identified as potential users of waterborne transportation services on the Charles River.

The first group, commuters utilizing public transportation from the market areas of Newton, Waltham and Watertown received surveys distributed directly at various public transportation stops in the specific market area. The surveys were distributed and returned directly to the UHI survey taker upon completion. Responses from this group were heavily weighted toward public transportation, however, this group provided the largest number of responses and the most valuable input.

The second target group was the potential tourist population and is primarily a market that would utilize a water taxi service rather than a commuter service. Survey's were hand delivered to five hotels located in Brighton, Cambridge, and Boston. The Days Inn, Guest Quarters Suite Hotel, Howard Johnsons Hotel, Hyatt Regency Hotel, Royal Sonesta Hotel. The surveys were then to be handed to customers as they checked into their hotel and mailed to the Institute when completed. Managers promised the moon, however, surveys were not placed into the hands of the clientel and limited responses were received.

A total of 1,255 surveys were distributed to the hotels. Of the survey's distributed to this group there was a total of 55 returned to the institute. An underwhelming 4.3%, approximately 34 responses from the Guest Quarters Suite Hotel and another 21 from the Howard Johnsons Hotel were received. No response was received from the other locations.

The third group represented a number of commercial and residential interests including workers at Mass General Hospital, patrons of the Cambridge Galleria Mall in Cambridge and residents of the Charles River Park area. At the mall location a survey taker stood outside and handed out surveys and then upon completion the survey was returned. The Institute received an underwhelming total of 19 from this location.

Survey's were also provided to the Charles River Park condominium and apartment complex in Boston. This group fits into the water taxi marketing category because they would most likely not utilize water transportation to commute to and from work. They may, however, use water taxi transportation to reach different destinations along the Boston and Cambridge sides of the Charles. Virtually no responses was received from this location.

Survey's were also hand delivered to the Science Museum in Boston, the target group at this location were the employees. No survey's were returned from this location.

###### **4.4.1.2 Summary of Results**

We received usable data from two groups, the commuting public and the Massachusetts General Hospital group.



On the question of utilization of waterborne service as their mode of choice, slightly more than half of the respondents said that they would utilize waterborne transportation if it was available. The greatest percentage of commuters responding to the question on potential stops indicated that they would use Daley Field or Christian Herter Park (Soldiers Field Road) as a starting point and either Harvard Square or Cambridgeside Galleria as stops.

The majority of the people in the commuter group were commuting to Boston and were residing in Newton, Watertown or Waltham. A fairly large percentage of the people surveyed in Newton, Watertown or Waltham, however, indicated that they came from another town in the area.

Over 270, slightly more than 50%, of the people surveyed indicated that their commute from the Newton, Watertown or Waltham area did not exceed 30 minutes. An additional 38% spent between 31 to 60 minutes to get to work from this market area. The responses indicated that over 313 of the 548 commuters utilized public transportation regularly. Over 274 people of the 548 indicated that they would use water transportation if the commute took between 30 and 40 minutes. When asked about water taxi services, 334 people or 61% indicated that they would be interested in utilizing that type of service along the Charles River

Over 80% of the Massachusetts General Hospital people indicated that they would be interested. Mass General employees also indicated that they would be willing to pay fares equal to certain levels of the MBTA's present structure. Slightly over one third indicated that they would pay \$1.00 for a one way ride. Forty-two percent indicated that they would pay \$27.00 per month.

#### **4.4.1.3      Survey Results - Group #1**

The following results were tabulated based upon the responses of group one, commuters from the target market area.

#### **QUESTION #1. Would you be interested in commuting to work using water transportation along the Charles River? Yes or No**

In response to this question, a total of 548 people returned questionnaires, with 305 answering yes they would consider waterborne transportation and 243 indicating that, no, they would not consider it.

#### **RESPONSES TO QUESTION #1**

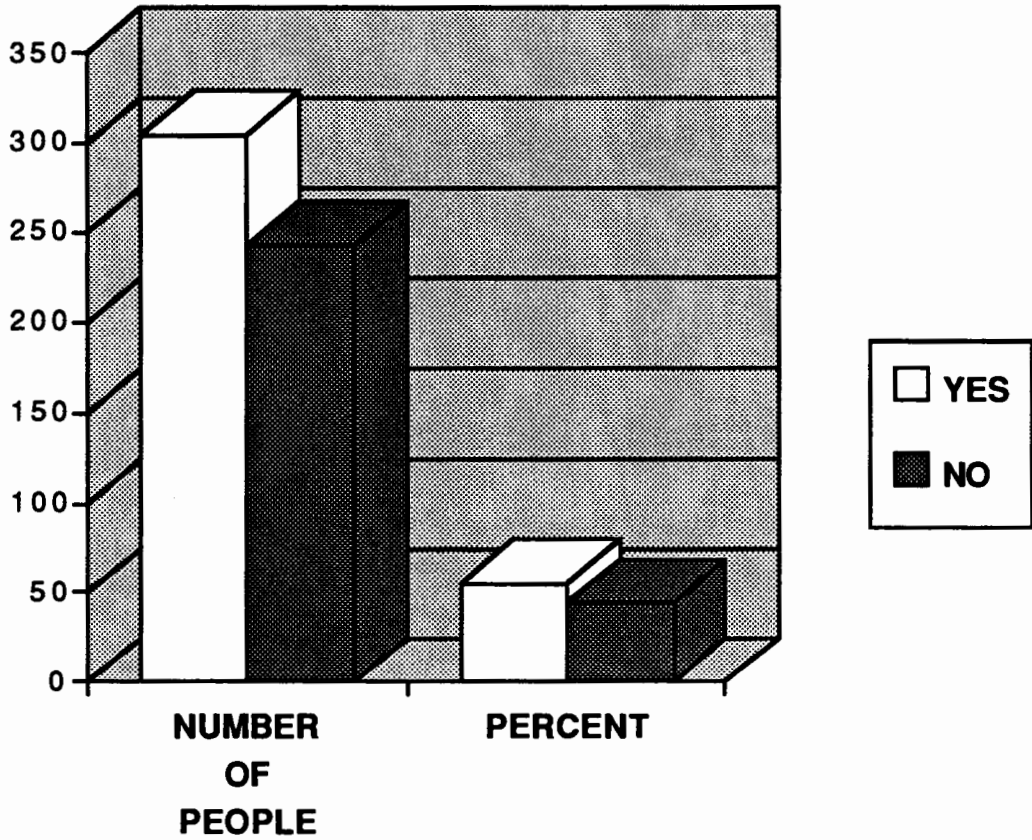
<b>Category</b>	<b># of People</b>	<b>Percent</b>
Yes	305	56%
No	243	44%
Total	548	100%

fig 4.9





**COMMUTING TO WORK USING WATER TRANSPORTATION**



Graphic - 4.1

**QUESTION #2**

Please check potential stops that you might use when commuting via waterborne along the Charles River.

The stops selected were Daley Field in Watertown; Soldiers Field Rd across from WBZ; the B.U. boat landing; Fairfield Street, Boston; Harvard Sq; the Esplanade at the Hatch Shell; Cambridgeside Galleria and the Science Museum.

**RESPONSES TO QUESTION #2**

Category	# of People	Percent
Daley Field	97	14
Soldiers Field Rd.	50	7
B.U. Boat Landing	50	7
Fairfield St, Boston	38	5
Harvard Square	161	23
Esplanade	93	13
Cambridgeside Galleria	115	17
Science Museum	96	14
Total	700	100

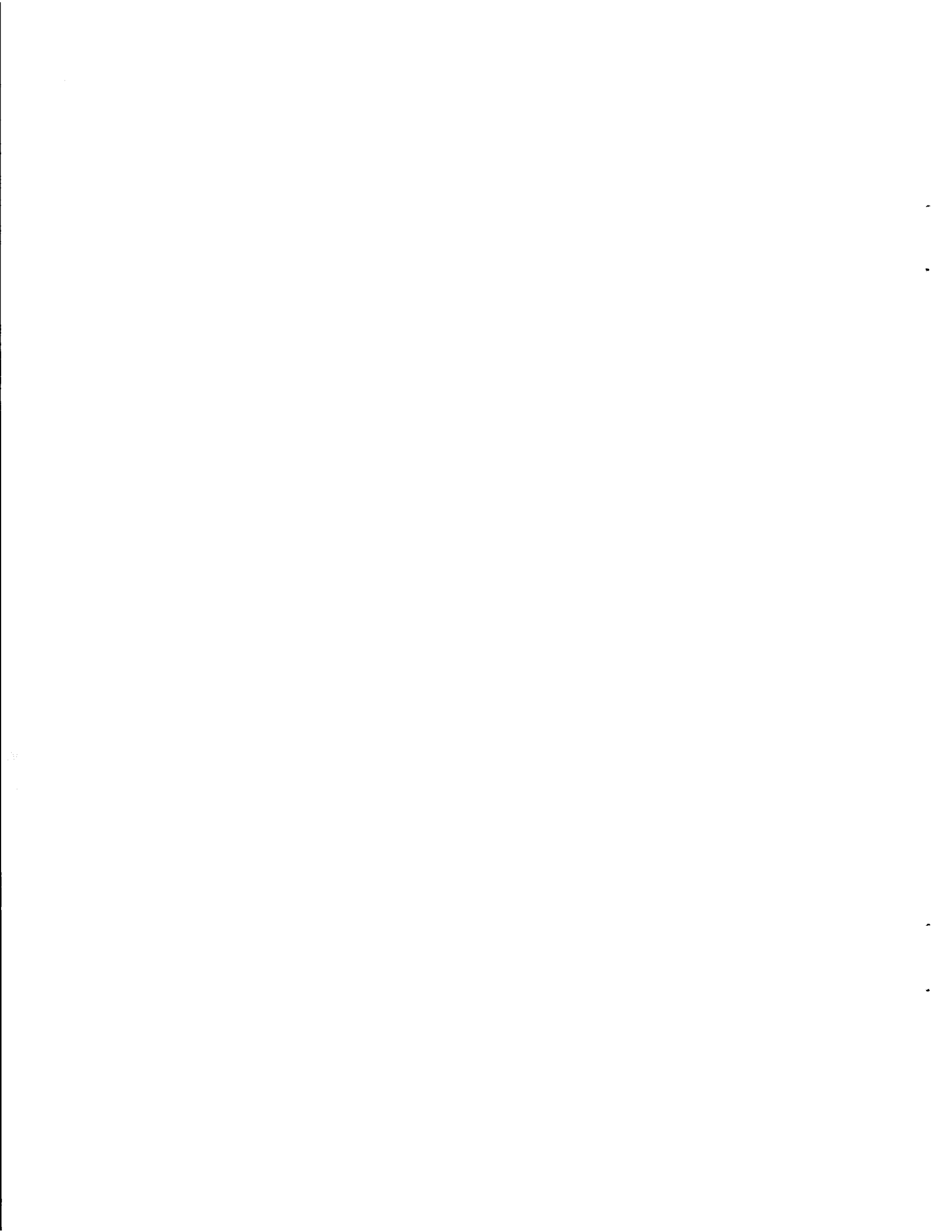
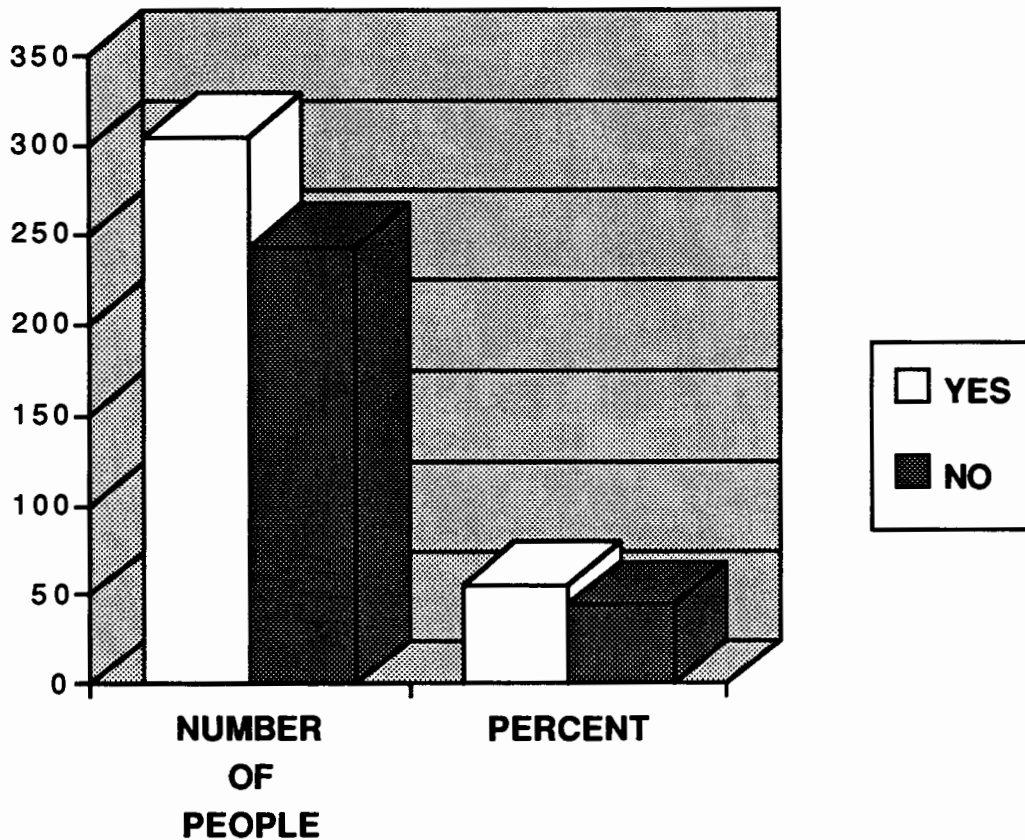


fig 4.10

**COMMUTING TO WORK USING WATER TRANSPORTATION**



Graphic - 4.2

**QUESTION #3.** In which city do you work?

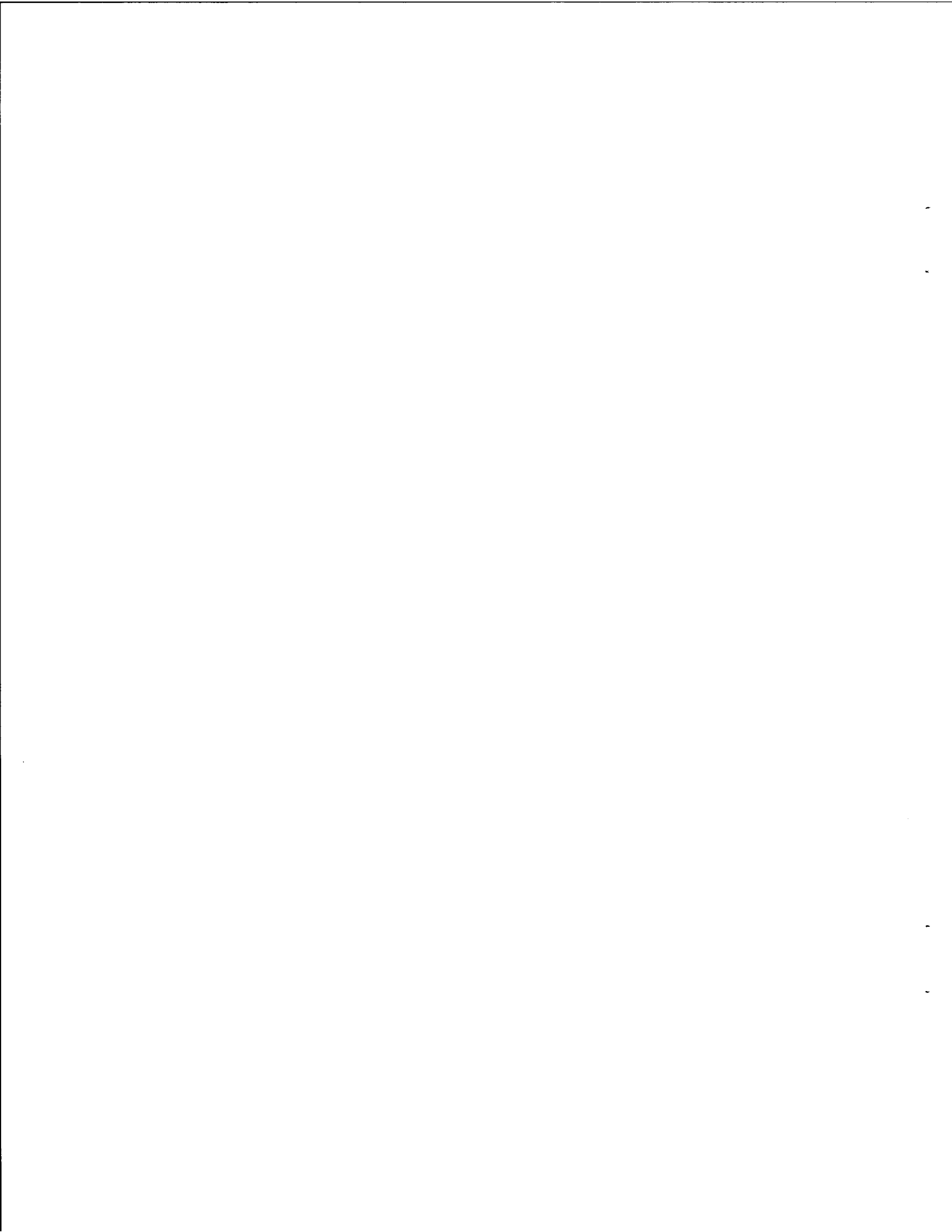
Out of a total sampling of 548 responses, 444 worked in Cambridge, and Boston. This represents 81.5% of the overall sampling.

Of the 81.5%, 67% of the people were commuting to Boston, and 14.5% were commuting to Cambridge. The remaining 18% were people commuting to communities located outside of our scope of study.

**RESPONSE TO QUESTION 3**

COMMUTING TO:	NR OF PEOPLE	PERCENTAGE
Boston	367	67.0%
Cambridge	80	14.5%
Other Communities	101	18.5%
<b>TOTAL</b>	<b>548</b>	<b>100%</b>

fig 4.11



**QUESTION #4.** In which city do you Reside?

Out of the total sampling of 548 people, 308 people lived in the cities of Newton, Waltham, and Watertown, representing 56% of the overall sampling.

Of the 56%, 20% represents those people living in Newton, 31% represents those people living in Watertown, and 5% represents those people living in Waltham. The remaining 44% represents locations outside of our scope of study.

**RESPONSE TO QUESTION 4**

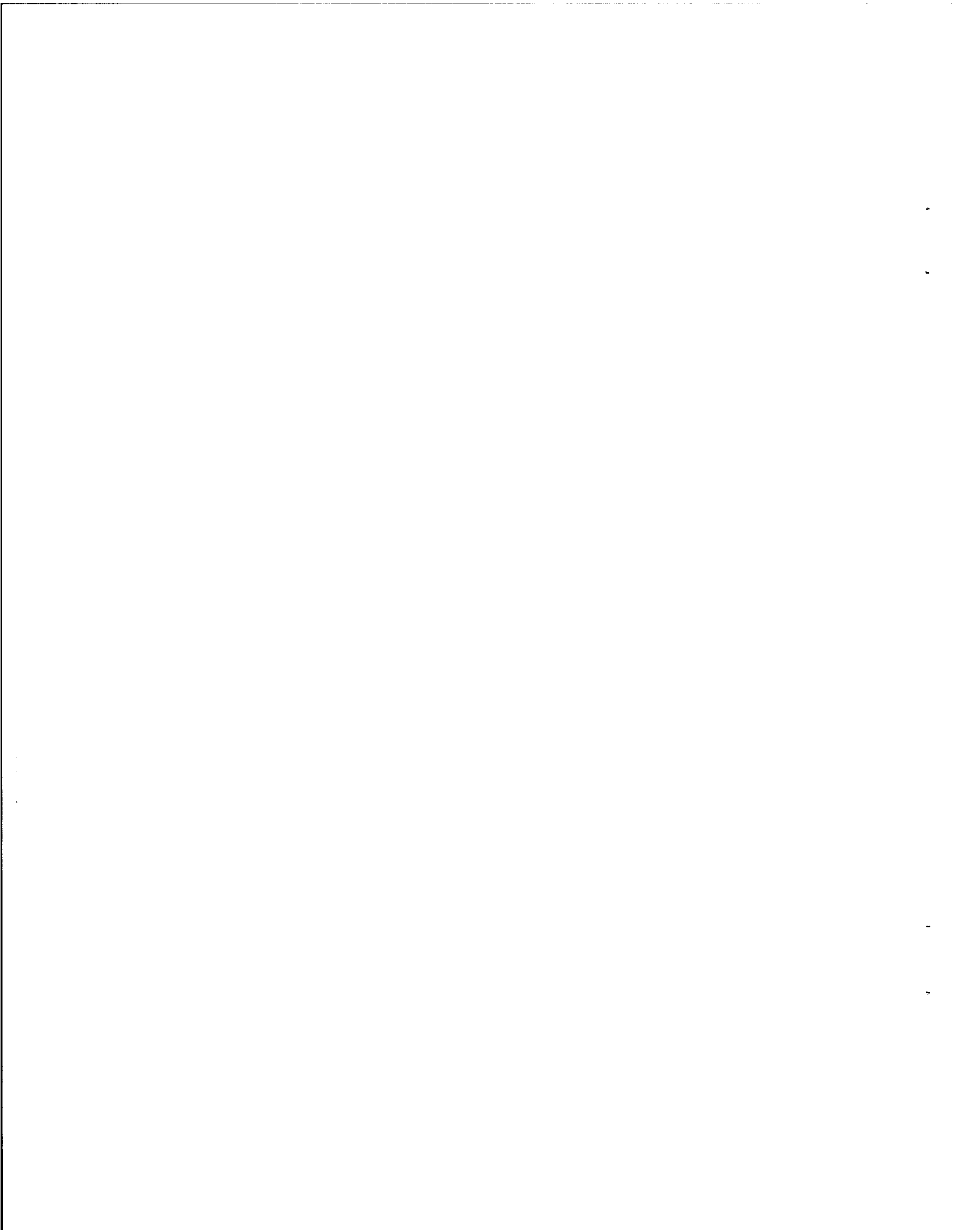
COMMUTING FROM	NR OF PEOPLE	PERCENTAGE
Newton	110	20%
Watertown	170	31%
Waltham	27	5%
Other Communities	241	44%
<b>TOTALS</b>	<b>548</b>	<b>100%</b>

fig 4.12

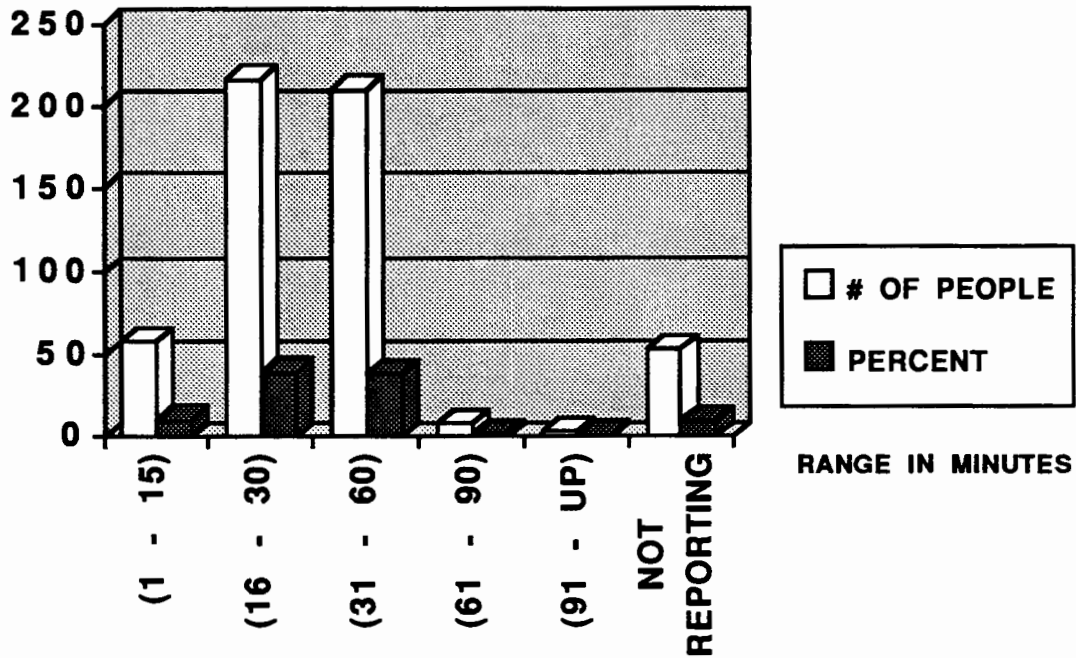
**QUESTION #5.** How long does your commute to work take you?**RESPONSE TO QUESTION 5**

RANGE IN MINUTES	NR OF PEOPLE	PERCENT
(1 - 15)	58	10.58%
(16 - 30)	216	39.42%
(31 - 60)	210	38.32%
(61 - 90)	8	1.46%
(91 - UP)	3	0.55%
NOT REPORTING	53	9.67%
<b>TOTAL</b>	<b>548</b>	<b>100%</b>

fig 4.13



### LENGTH OF TIME TO COMMUTE TO WORK



Graphic - 4.3

**QUESTION #6**

What mode of transport do you normally use to commute to work?

Over 57% of the people responding to this question indicated that they normally utilized public transportation.

**RESPONSE TO QUESTION 6**

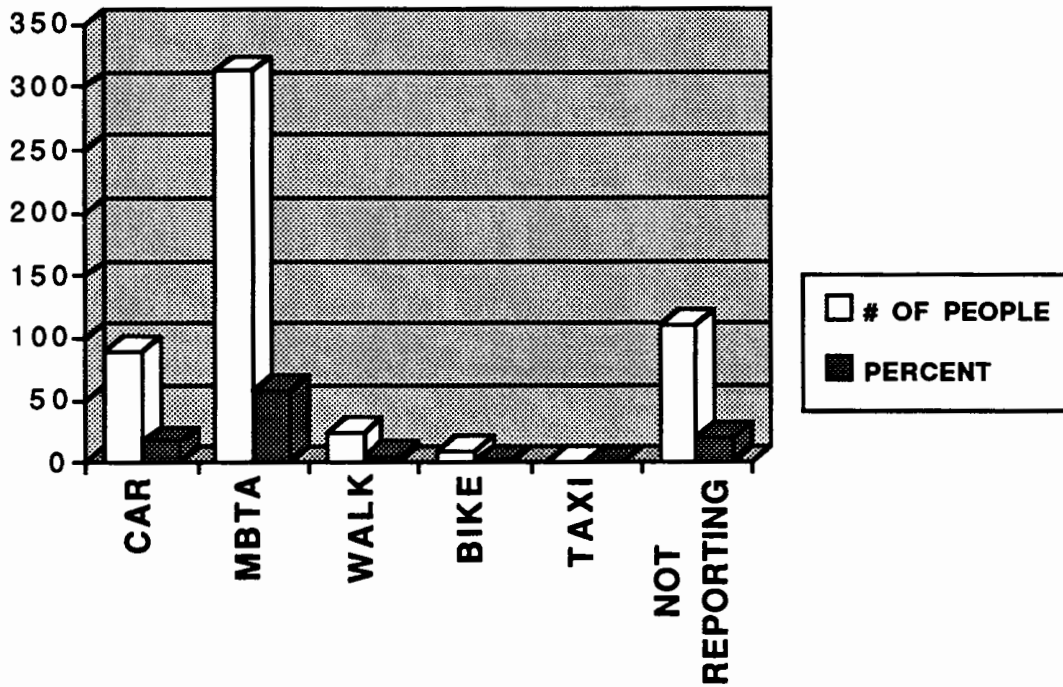
TRANSPORT MODE	NR OF PEOPLE	PERCENTAGE
Car	90	16
MBTA	313	57
Walk	24	4
Bike	9	2
Taxi	1	1
Not reporting	111	20
<b>TOTAL</b>	<b>548</b>	<b>100</b>

fig 4.14





## MODES OF TRANSPORTATION



Graphic - 4.4

**QUESTION #7**

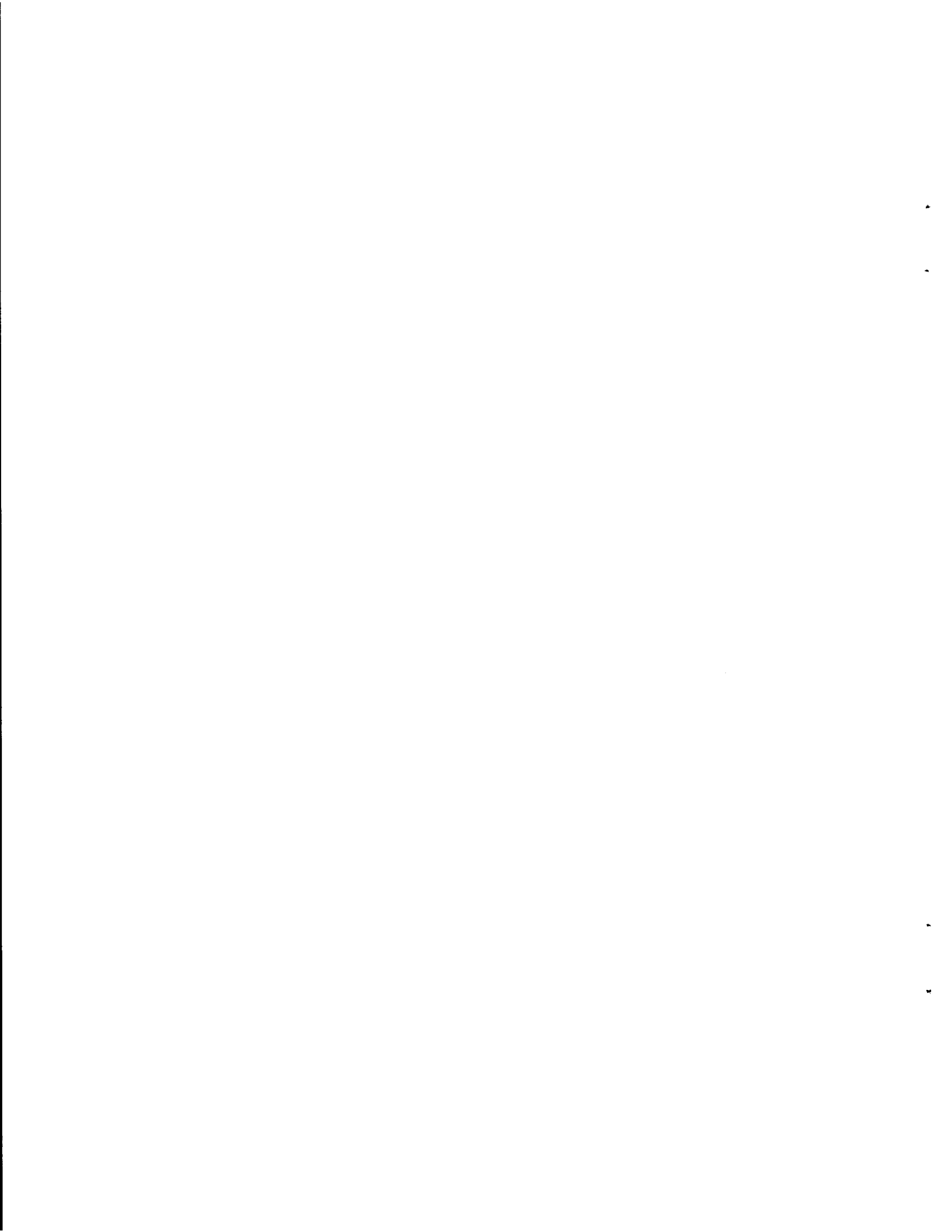
Would you be willing to commute by water if it took you: 30 to 40 minutes, 40 to 50 minutes, 50 to 60 minutes, other?

Approximately 590 people responded to this question, indicating first that there was an interest expressed by public transport users in utilizing a water conveyence to commute to work and second, indicating the amount of time they would consider allowing to get to their destination.

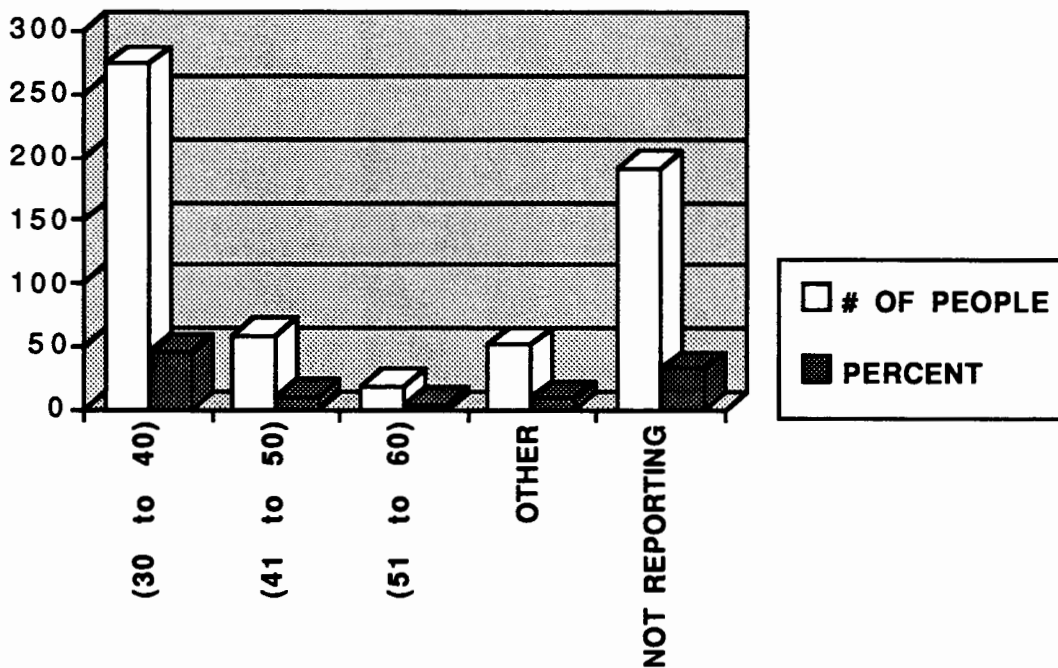
**RESPONSE TO QUESTION 7**

COMMUTING TIME	NR OF PEOPLE	PERCENTAGE
30 to 40 minutes	274	46
41 to 50 minutes	58	10
51 to 60	18	3
Other	51	9
Not Reporting	191	32
<b>TOTAL</b>	<b>592</b>	<b>100</b>

fig 4.15



**WILLINGNESS TO COMMUTE BY WATER TRANSPORTATION**



Graphic - 4.5

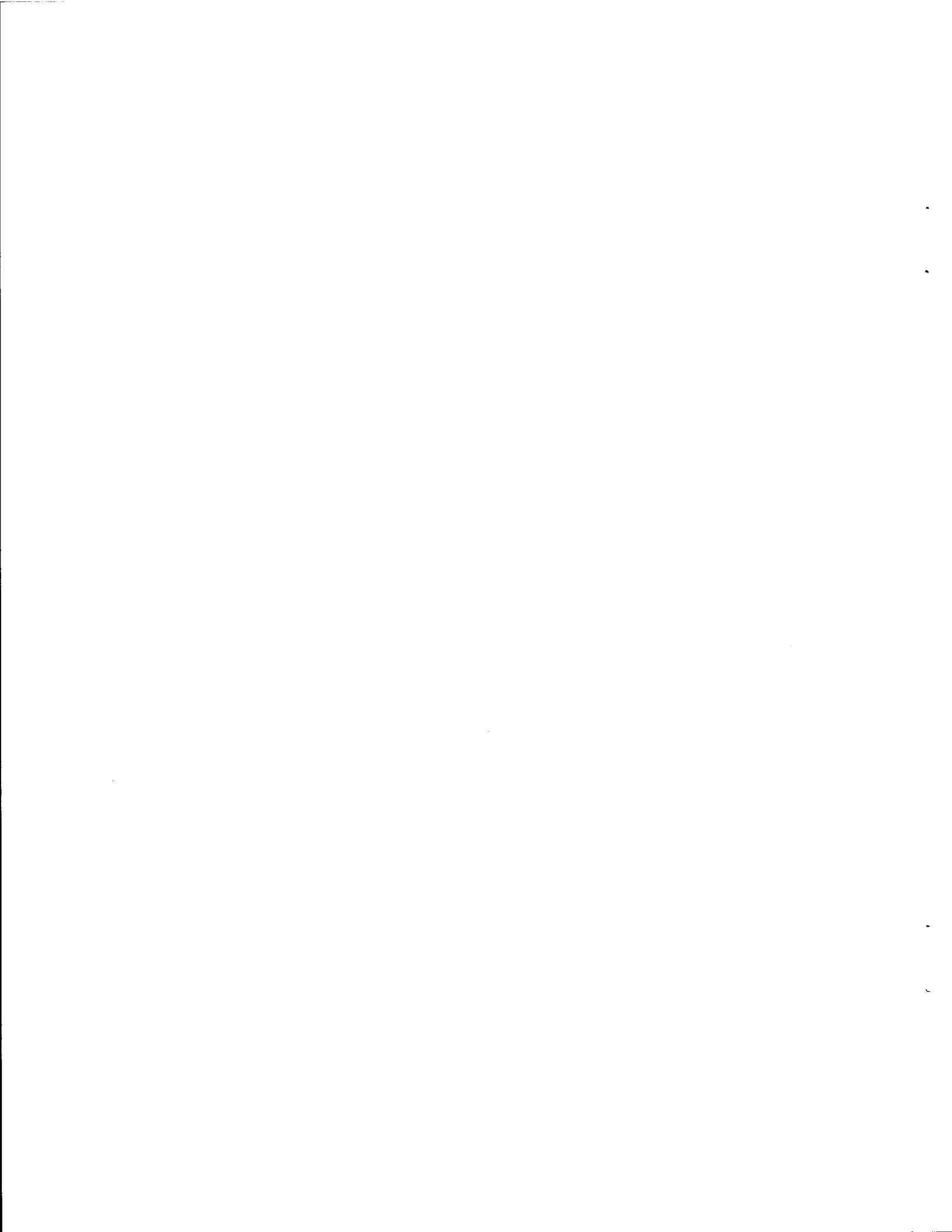
**QUESTION #8.** Would you be interested in a water taxi service if it was available along the Charles River? Yes No

Over 61% of the 548 respondents to question 8 indicated that they would consider utilizing water taxi service on the Charles River if it was available.

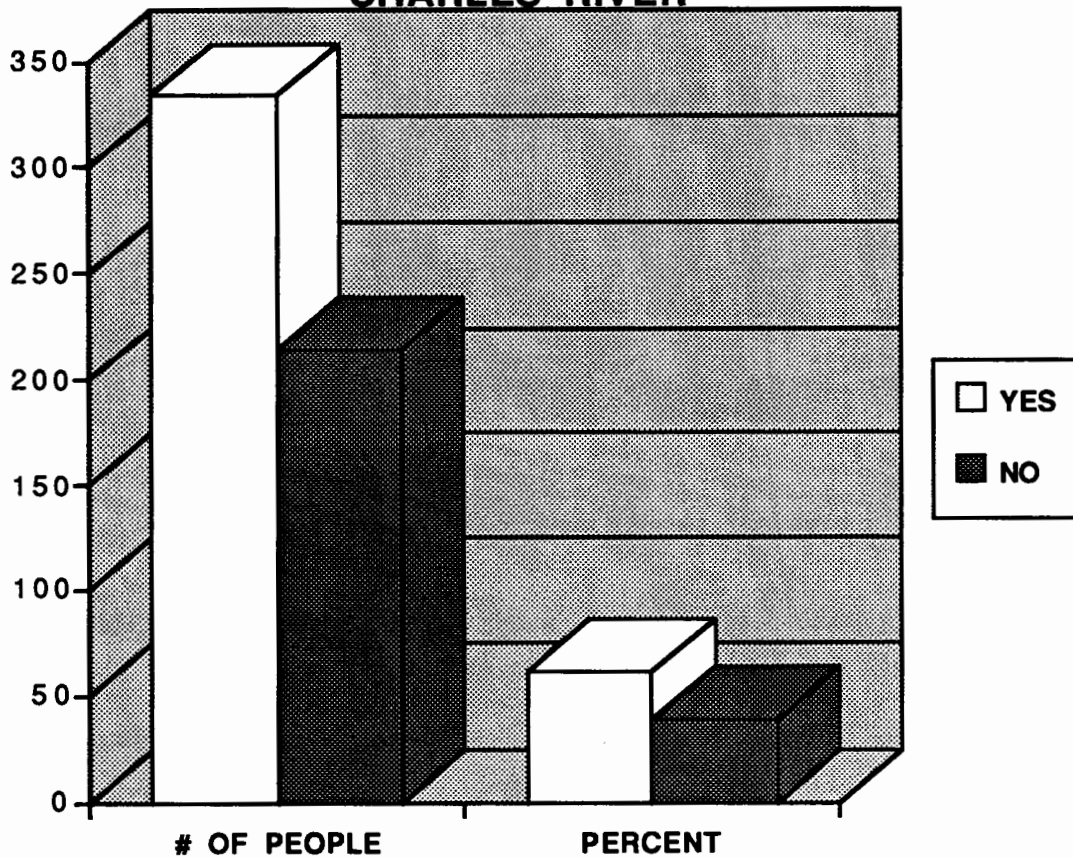
**RESPONSE TO QUESTION 8**

OPTION	NR OF PEOPLE	PERCENTAGE
Yes	334	61
No	214	39
<b>TOTAL</b>	<b>548</b>	<b>100</b>

fig 4.16



## INTERESTED IN WATER TAXI SERVICE FROM THE CHARLES RIVER



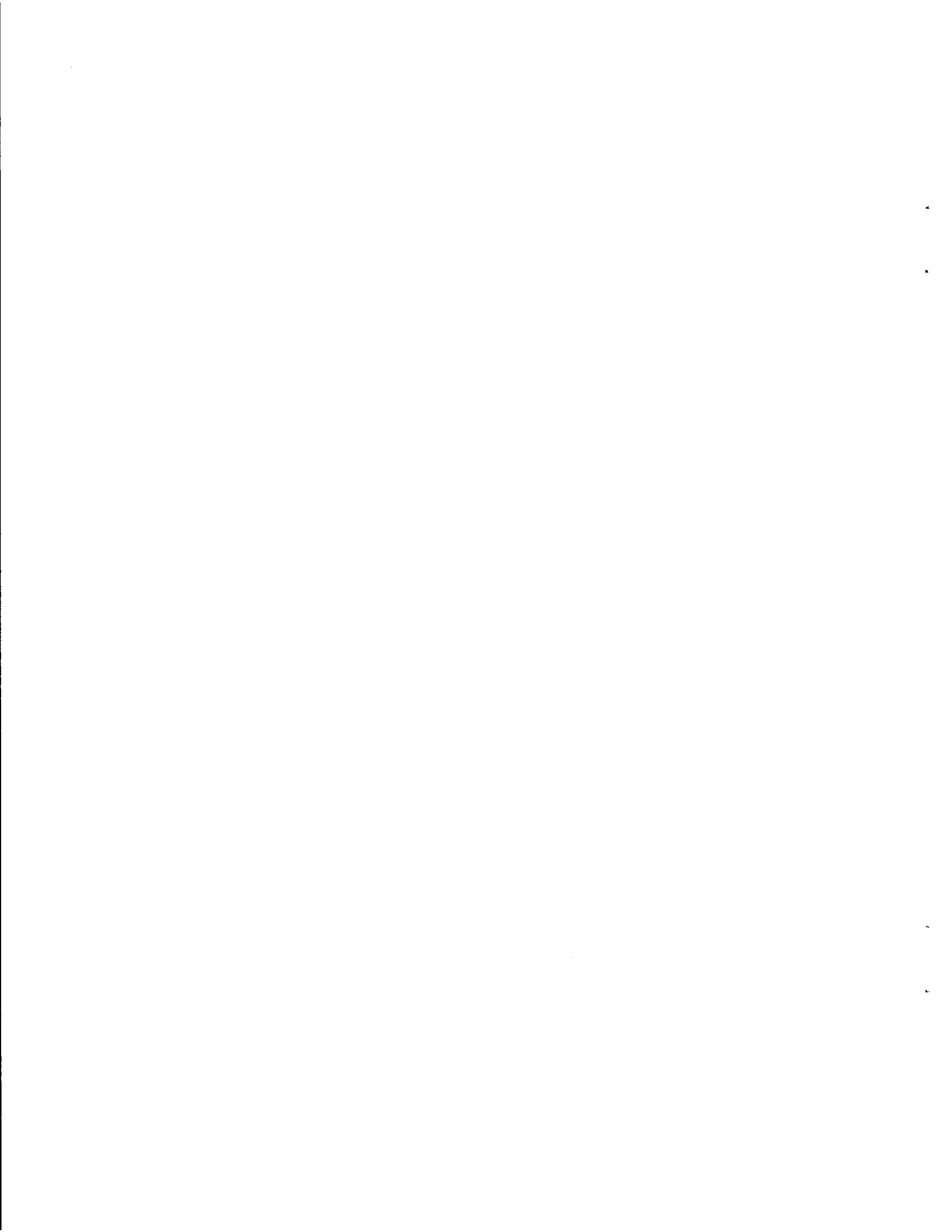
Graphic - 4.6

### 4.4.1.4 Survey Results Group 2

On September 22, 1993, the commuter staff person at Massachusetts General Hospital held a fair at the hospital. At the fair, a UHI survey was distributed to employees of the hospital attending. The survey included three questions for people who travel from Newton, Allston, Brighton, Watertown and Cambridge to Boston. The three questions were:

QUESTION #1.      If a water taxi were available with a stop at or near Charles Street Circle, would you consider taking it?    Yes or No

The results based upon 100 people responding to this questions was a resounding yes. Over 80% said yes, 20% no.



**QUESTION #2**

How much would you pay for a round trip ticket?

- o Same as a monthly subway pass - (\$27.00)?
- o Same as a monthly bus pass (\$20.00)?
- o \$1.00 each way?

Response to this question was mixed: 42% said they would pay \$27.00 a month, 33% said they would pay \$1.00 each way and 8% said they would pay \$20.00 a month. Approximately 17% did not respond.

**QUESTION #3.**

Do you think a 25 minute commute would be competitive with other modes of transport? Yes or No

Response to this question indicated that 75% of the respondents felt that 25 minutes would be a competitive travel time, and would utilize the service under those circumstances. Approximately 5% said 25 minutes was not a competitive travel time, but would still would take the trip. The remaining 20% said it is not competitive or just said no.

**5.0 VESSEL OPERATION AND WATERBORNE COMMUTING****5.1 General**

Any mass transportation alternative to the automobile is deemed a positive step for mankind. The benefits that a rail, bus or waterborne commuting system seem to bring to a community - reduction of general traffic congestion, reduction in wear and tear of the infrastructure, reduction in negative environmental impacts and a reduction in the utilization of energy resources - may serve to off-set any arguments against new forms of public transportation.

The bottom line, however, is that: (1) Someone must step forward with a proposal (2) A proposal must receive the verbal and then actual support of not only the general public but the officials who establish regional transport policy and (3) Someone must develop the physical and fiscal means to get to the end. The fact is, unfortunately, that citizens may dream a specific transport mode into existence because it may seem viable, only to see it eventually fail as a private venture or ultimately require large public subsidy to continue.

The essential elements on the feasibility of a waterborne commuting service relative to those factors, will be discussed in this section. Remembering that the majority of the modern day commuting type ferry services in the Boston area have to date existed only with substantial outside financial subsidies, we have conducted this investigation into the potential of establishing a commuting service on the Charles River with this in our minds. It is not, however, foremost in our analysis.

By looking first at the commuting habits of the region and specifically the market this mode of transport would serve and then considering the elements that would impact the development of viable service along the Charles River route, we hope to emphasize the basis for a rational plan of action. Based upon the results of this portion of the analysis, we will then consider the financial implications.





## **5.2 General Ferry Viability In the Boston Market**

Despite the positive approach of the proponents of mass transportation via water in the Boston metropolitan area, the majority of the region's commuters prefer, in descending order, their automobile, the bus, light rail and commuter rail services. These factors exist even where water services are available.

Waterborne commuters are a small, loyal Group.

The three elements that seem to typify waterborne mass transportation services in the Boston area are: (1) they are generally established as mitigation to construction related projects not as beneficial, required transportation; as such, (2) they are subsidized heavily; and (3) they are generally not the favored mode of transport and not supported with a representative percentage of the commuting public. As example, in the Boston metropolitan area, five waterborne transportation services exist.

### **5.2.1 Hingham to Boston**

This service was created to mitigate work that was being performed on the Southeast Expressway, a major artery leading to Boston from the South Shore area. It is operated by a private corporation through a contract with the Massachusetts Bay Transportation Authority (MBTA). The contract includes an operating subsidy paid directly by the MBTA based upon an agreed upon formula.

### **5.2.2 Charlestown to Boston**

This service was created as a mitigation effort based upon the 15 to 20 year project to depress the central artery (The Big Dig). It is operated by a private corporation through a contract with the MBTA. The contract includes an operating subsidy paid directly by the MBTA based upon an agreed upon formula.

### **5.2.3 Boston to Logan Airport**

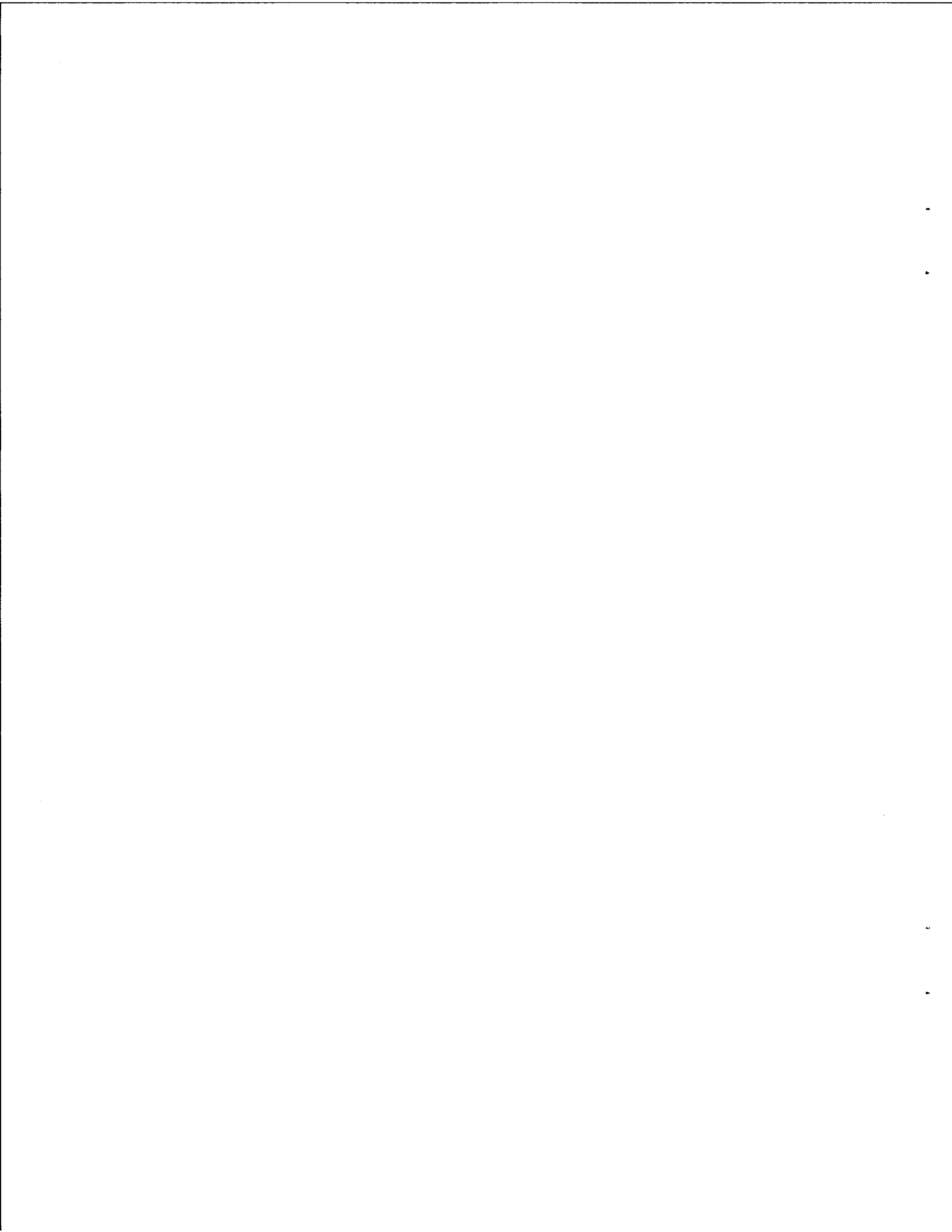
This service was created as part of a Chapter 91 issue, where a private developer was required to create waterfront use and public access to justify development of waterfront property. It is operated by a private corporation and is supported by the developer of the Rowes Wharf hotel and condominium property and the Massachusetts Port Authority.

### **5.2.4 Boston to Hull/Boston to Charlestown**

This service was created by the operator in response to special client requests. It is operated by a private corporation and is subsidized by them. There is no contract with the MBTA at present, however, one is being negotiated (Hull to Boston). The Charlestown portion of this company's service is provided in conjunction with its regular harbor excursion and tour route but would not be operated as a stand alone service.

### **5.2.5 Marina Bay, Quincy to Deer Island**

This is a service established by the Massachusetts Water Resources Authority (MWRA) to shuttle workers to and from Deer Island, a property under development in support of the Boston Harbor clean-up. It is operated by a private operator under contract and is purely mitigation of traffic impact.



### **5.3 Ferry Operations on the Charles**

#### **5.3.1 General**

Until the late 1980's, the Charles River had been utilized largely for recreational purposes. Rowing, sailing and power boating (with access to the Boston Harbor and open waters) were the most popular forms of water activity. To a large extent, much of the Charles River appears to be a land locked body of water and a long lake rather than a free flowing river emptying into the Boston Harbor and on to open ocean. For that reason, much of the commercial potential of the river has been stifled.

The relative quiet on the river, brought about by the overwhelming numbers of recreational craft operating without the assistance of motor power, was recently broken by the appearance of the commercial Charles Riverboat Company, offering excursion tours as well as dinner and party cruises. Basic transportation water transportation is the next level of activity. Since there are a number of bridges strategically placed along the most heavily traveled sections on each side of the river, cross river water transit operations are not appropriate. Commuter service along the river and/or water taxi service providing different levels of service have a potential.

#### **5.3.2 Potential Types of Service**

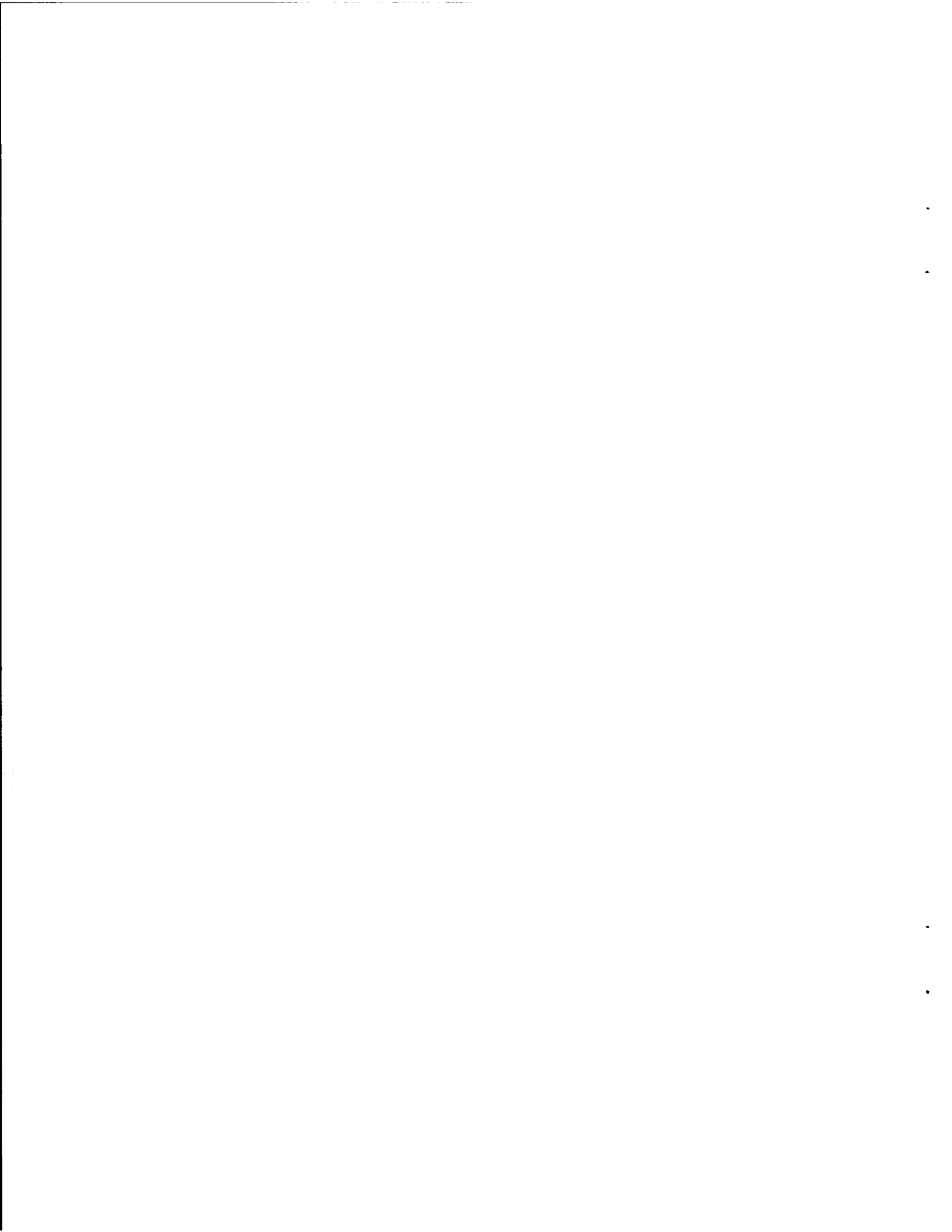
##### **5.3.2.1 Commuter**

Water commuter service must provide a scheduled service at least five days per week, during peak commuting periods (6:00 AM to 9:00 AM and 4:30 PM to 6:00 PM). The service can operate from a single origin to a single destination or it can provide multiple stops along the route while getting to its destination. Waterborne commuter service must offer competitive fares, timely schedules and frequency of service, rider comfort and service reliability to attract a suitable following among commuters.

##### **5.3.2.1 Water Taxi**

Water taxi services provide basic transportation on call or ply a specified route, much like a bus service. On call style water taxi services means that a customer can call at any time and demand pick-up at a location and delivery to his desired destination. Water taxi services operating on a specified route, operate to and from a number of established points, whether customers are waiting or not.

Water taxi services differ from their landside counterparts in that their mode of transport (the vessel) is usually more costly than a taxi (capital cost) and atleast as costly to operate (operating expenses). The value of a specific water taxis service can be judged by its ability to provide convenient service to specific points. The critical aspects of water taxi service become the landside considerations, taking into consideration the availability of docking space at strategic points, access to land from these docking areas, access to land transportation and accessibility to areas where customers wish to come from or go to. Water taxi services can also be time consuming and competition depends upon distance between pick-up and delivery and the general landside traffic situation in the area.



### **5.3.3 Description of selected river commuter vessel and water taxi designs**

The tour boat company located in Cambridge, the Charles Riverboat Company, operates two vessels on excursion, dinner party and sight seeing cruises up and down the Charles River. The owner of this company has indicated that he designed both of his boats with specifications to fit the characteristics of the river and its surroundings.

Any boat operating on the waters of the Charles River must have a shallow draft, a low vertical clearance and create a limited or no wake. The dimensions of the Charles Riverboat vessels, built to accommodate the restrictions of the river are as follows: 50 feet in length, 16 foot beam, 2 foot draft, and a vertical clearance of under 11 feet. Each of these vessels cost between \$200,000 to \$300,000 to custom design and build.

SkipperLiner Marine located in La Crosse, Wisconsin builds and operates a number of vessels suitable for commuter or water taxi service along the Charles River. Their vessels include two water taxi designs and three European style canal boat designs. The specifications of each of these vessels will meet the restrictions for shallow draft, low profile and low speed required on the river.

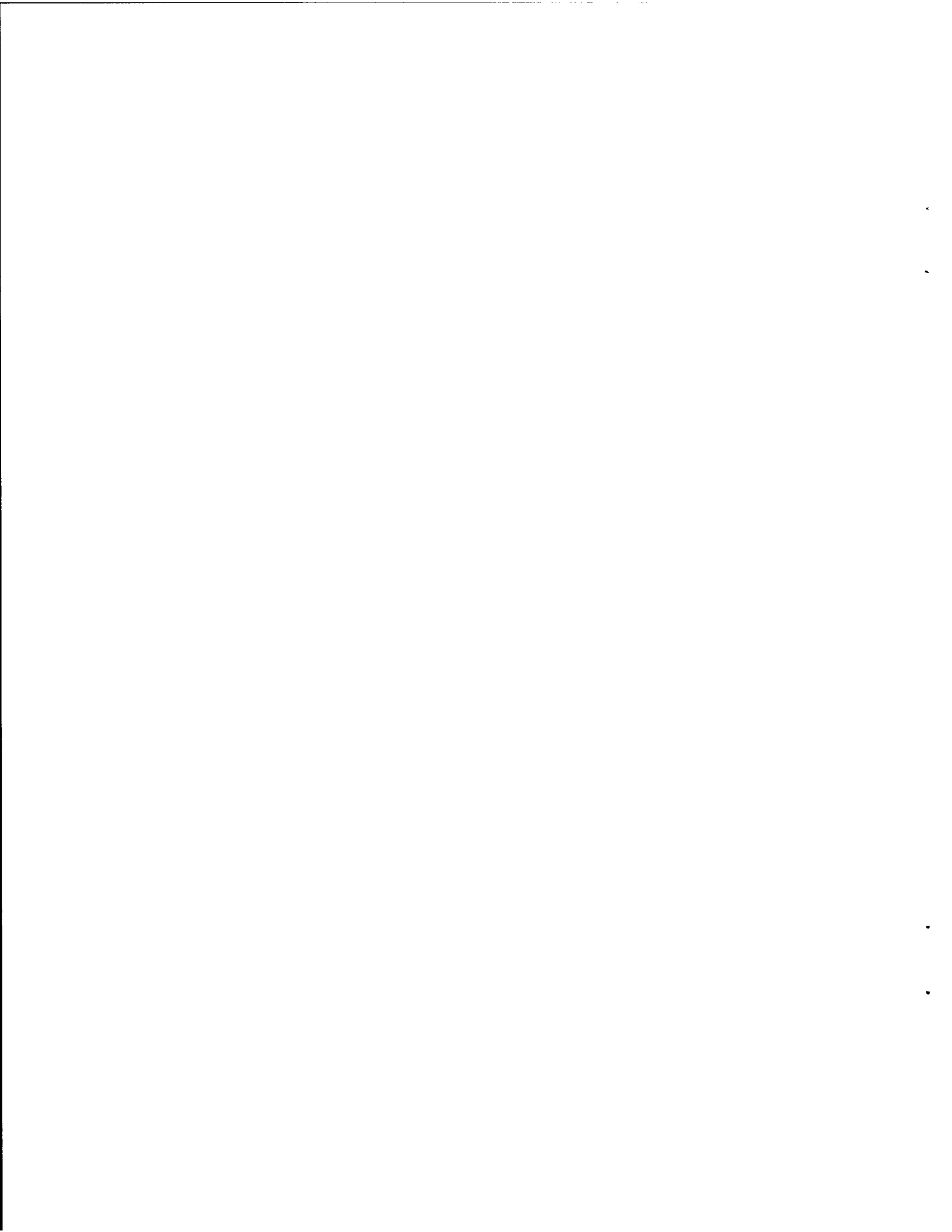
A primary example is the EC 1500, a steel hulled, 150 passenger Canal Boat. This vessel is 72 feet long with a draft of 4 feet. It is designed with a low profile, 9' above the water line. This design allows easy access under low bridges such as those on the Charles, yet it provides easy access for patrons. These style vessels, used in Europe on the canals as sightseeing craft, have side and overhead windows for complete enclosure during foul weather and visual panorama. Other styles of this design are 52' and 65' long carrying 49 and 100 passengers respectively.

Both of the above Skipperliner style vessels (water taxi and European) would serve very nicely in either a commuter or a water taxi capacity. The present Charles Riverboat vessels could also serve as commuter and water taxi vessels, however, they are designed as excursion and dinner type vessels.

There are several successful water taxi systems in existence on the Eastcoast of the United States, three in Maryland and one serving the Miami/Fort Lauderdale, Florida area to mention a few. These services operate within protected areas on intercoastal waters in Florida and in the case of the Maryland taxis, in the Baltimore inner-harbor and the harbor at Annapolis.

The Baltimore operations utilize very simple, aluminum pontoon vessels with canopied cover. Seating is available for the cross harbor runs. The vessels operate on an established route and patrons can purchase a daily pass which entitles them to ride anywhere on the system for one full day. The Fort Lauderdale/Miami operations utilize small conventional hull vessels and the flat pontoon style vessels to move passengers from shore to shore on the intercoastal waterway as well as within the Miami and Port Everglades harbor areas. On the majority of their runs, they do not have to worry about draft, height or wake restrictions.

Stillwater Design, a Cambridge vessel design and fabrication firm, can offer no wake boats. The owners, Mssrs. Dick Parelli and Crispin Miller indicated that they could design a vessel to carry at least 49 passengers. The dimensions for this catamaran style would be forty-five feet to sixty feet overall length, twelve to fifteen foot beam and two to three feet draft. The cost would be approximately \$50,000 to \$70,000 per boat. This figure does not include provision of the two outboard motors required to power the boat which would cost approximately \$3,000 to \$4,000 each. Either style of boat as described above, would have a seating capacity of approximately forty nine passengers. Although no speeds were quoted by the designers, it is anticipated that these vessels would be able to travel faster than 6 to 10 miles an hour with no or very low wake.



### **5.3.4 Potential Routes**

#### **5.3.4.1 General**

The establishment of a route for a waterborne commuter service must take into consideration the needs and desires of the market it intends to serve which will include: the origin and destination required, schedule compatibility, availability of docking sites and passenger facilities, parking and/or interlinking transportation.

#### **5.3.4.2 Commuter**

The commuter service we are considering would potentially run from the Newton/Watertown area, along the Charles River to points either on the Cambridge or Boston side or from Newton/Watertown to a single point along the Boston side of the Charles River or from Newton/Watertown through the locks in Boston and on to the Boston Harbor waterfront.

There are two possible departure sites in the Newton Watertown area. The first is **Daley Field** on Nonantum Road in Watertown. The second site is **Christian Herter Field** on Soldiers Field Road.

The **Daley Field** site is utilized as a boat ramp, during the boating season, however, there is no docking facility. There are two large parking lots adjacent to this location and access via Nonantum Road from all three of the market areas is fair to good.

The **Christian Herter Park** site is further East, toward Cambridge and Boston, located off Soldier's Field Road. This site has a public dock but not a passenger area already in place. There is a large public parking lot adjacent to this site and vehicular access is good to excellent.

Between the departure sites and the final destination there are several potential locations for drop off and pick-up, however, under the circumstances a non-stop, express type service, may be more saleable to the commuting population if a service was to begin. Additional stops could be provided as the service developed.

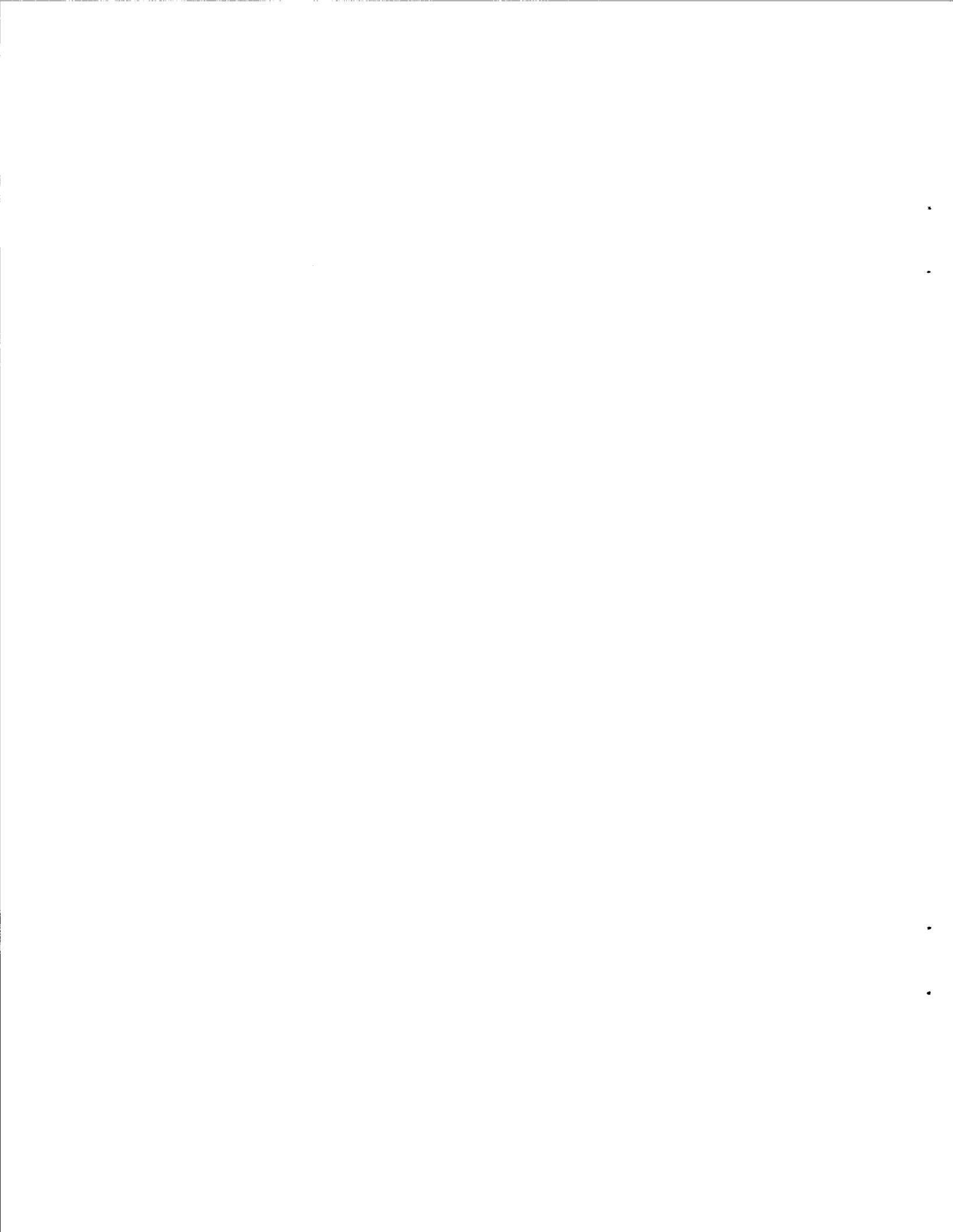
The speed limit on the Charles River is six miles per hour from Watertown to The Boston University Bridge. From the Boston University Bridge into Boston, the speed limit increases from six miles per hour to ten miles per hour.

The ride downriver into Boston from the MDC location at **Daley Field** on Nonantum Road would be about forty-five to fifty minutes non-stop. If you add in any of the potentially eligible stops listed on the passenger survey, the total travel time would increase a minimum of two to three minutes per stop.

If the initial departure site was located at **Christian Herter Field** in Brighton, the nonstop trip would take thirty-five to forty minutes.

#### **5.3.4.3 Water Taxi**

One approach to water taxi routing is to begin and end at specified points, along a prearranged route, running on a pre-set schedule. This service can be likened to bus service, however, the stops available will be limited by the availability of docking space. At the present time, there are limited sites available along the Charles and those docks that are available, are in varying degrees of repair.





A second approach to water taxi service is to provide on demand, on call availability. Responding to requests for service, the taxi service would ferry customers from one prearranged point to another. Water taxi service in this instance is limited by the availability of docking space, but would be ideally suited for movement up and down the river from various hotel sites, shopping areas, boat houses, marinas and recreational sites.

In addition to the two locations mentioned above, there are a number of sites that could serve as pick-up and drop-off for a water taxi service.

The first potential stop is located near Harvard Square, more specifically at the Lars Anderson Bridge. From there, the walk into Harvard Square is approximately two to three minutes. The Harvard Square area is heavily trafficked and commercialized with shops, restaurants, businesses and of course, campus areas of Harvard University. There is a large college community moving through the area, with Harvard University athletic facilities and school centers within easy walking distance.

A second potential stop is located between the Western Avenue Bridge and the River Street Bridge. This location is close to Central Square, as well as the Brighton and Allston areas. The following companies are also close to this area: Channel Two, Guest Quarters Suites Hotel, Genzyme, Riverside Technologies, Polaroid, and Howard Johnsons Hotel. These companies are all within a five to ten minute walk from the Western Avenue Bridge area.

There is also easy access to both Memorial Drive and Storrow Drive from this stop. An alternative to this stop could be a stop at either of the hotels mentioned above, the Guest Quarters Suites or the Howard Johnsons Hotel.

A third potential stop lies just beyond the Boston University sailing pavilion. This dock is referred to as the Boston University Landing. Close to this dock is a footbridge that takes you onto Commonwealth Avenue in Boston. The walk from the dock to the footbridge is approximately three minutes. The walk from the bridge on the other side into the Fenway Park area is approximately ten minutes. There is also the MBTA green line connection on Commonwealth Avenue.

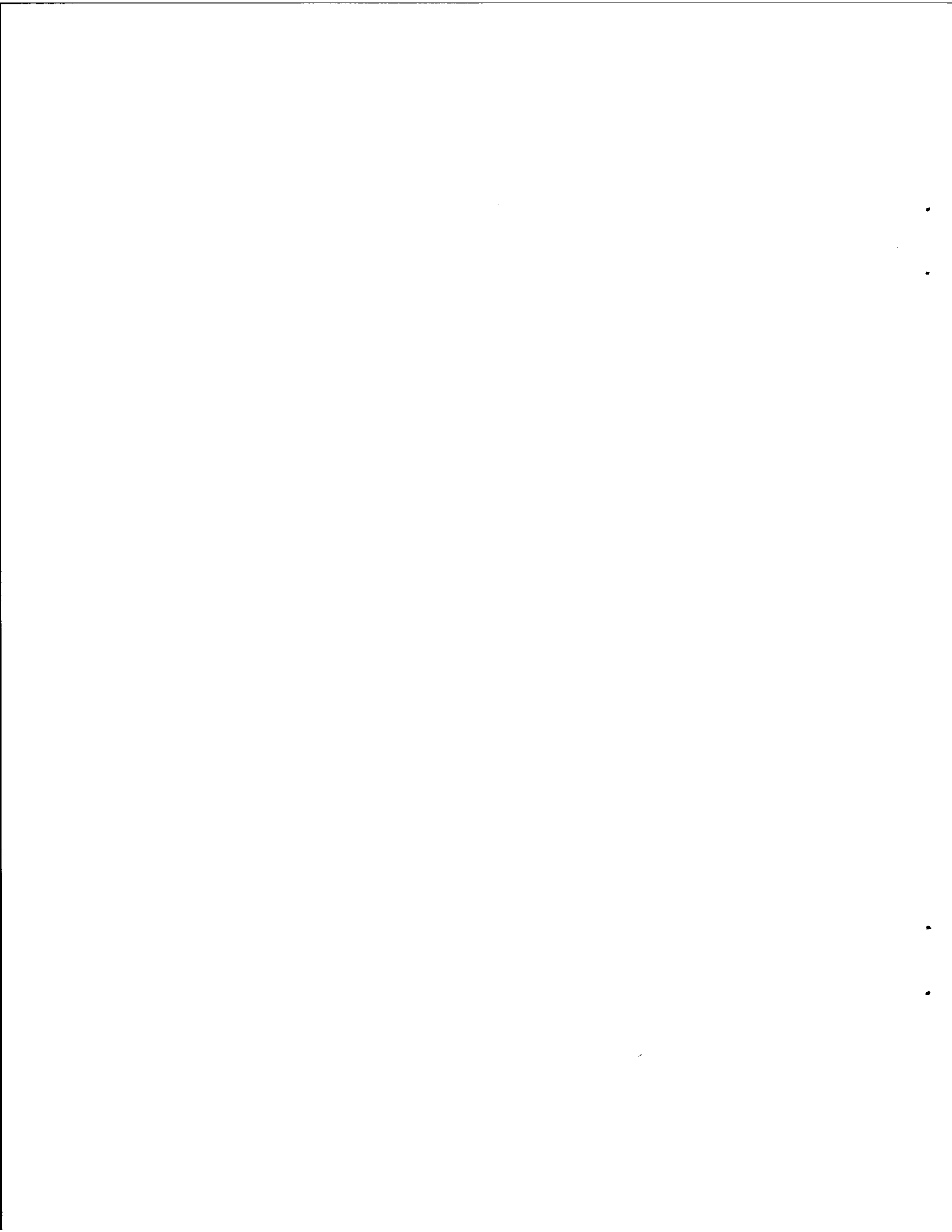
A fourth possible stop is located at the Hyatt Regency Hotel on Memorial Drive in Cambridge. A stop here would be within walking distance of the hotel and Massachusetts Institute of Technology (M.I.T.).

A fifth possible stop is on the Boston side of the river at the public dock located at the end of Fairfield Street. A stop here would provide access to areas such as the Hynes Convention Center, the Prudential and the John Hancock buildings and the western portions of Newbury and Boylston Streets.

A sixth possible stop is the public dock located at the Esplanade/Hatchshell. Access from here would be possible to many community activities at the Hatchshell, including the world renowned "Boston Pops" orchestra. The eastern end of Newbury and Boylston Streets as well as the Boston Common and the Public Gardens are within walking distance. Easy access across Storrow Drive is also within close proximity.

A seventh potential stop would be at the dock presently located behind the Science Museum with access to the museum and within walking distance to the Boston Garden.

An eighth potential stop would be at the dock located behind the Cambridge Galleria. This stop will provide access for Galleria shopping activities, hotels, riverfront condominiums, businesses such as Lotus and a number of office areas within walking distance.



### **5.3.5 River Barriers - Characteristics of the Charles**

As described, it is approximately 10 miles from Watertown Square to the Science Museum in Boston via the river. The Charles meanders in a narrow fashion until it passes the Boston University Bridge. It then widens into what is referred to as the Charles River Basin. The Charles River route along these ten miles has some very unique characteristics which can cause some problems for boats traveling its course.

#### **5.3.5.1 Bridges**

There are many bridges that span the Charles River, most of which have low clearance. The controlling height, based upon these measurements is approximately eleven feet.

**BRIDGES OVER THE CHARLES RIVER  
BRIGHTON TO BOSTON**

<b>BRIDGE</b>	<b>VERTICAL CLEARANCE</b>	<b>HORIZONTAL CLEARANCE</b>	<b>YEAR CONSTRUCTED</b>
Eliot	14'	50'	1950
Lars Anderson	12'	45'	1913
Western Avenue	12'	45'	1824
River Street	12'	45'	1810
B.U. Bridge			1920
Harvard Bridge	14'	50'	1891

fig 5.1

#### **5.3.5.2 River Depth**

The Charles River although, considered a navigable waterway, requires extremely shallow draft in many areas. According to the Corps of Engineers, the U.S. Coast Guard and the Metropolitan District Commission, there are no soundings available for the Charles River.

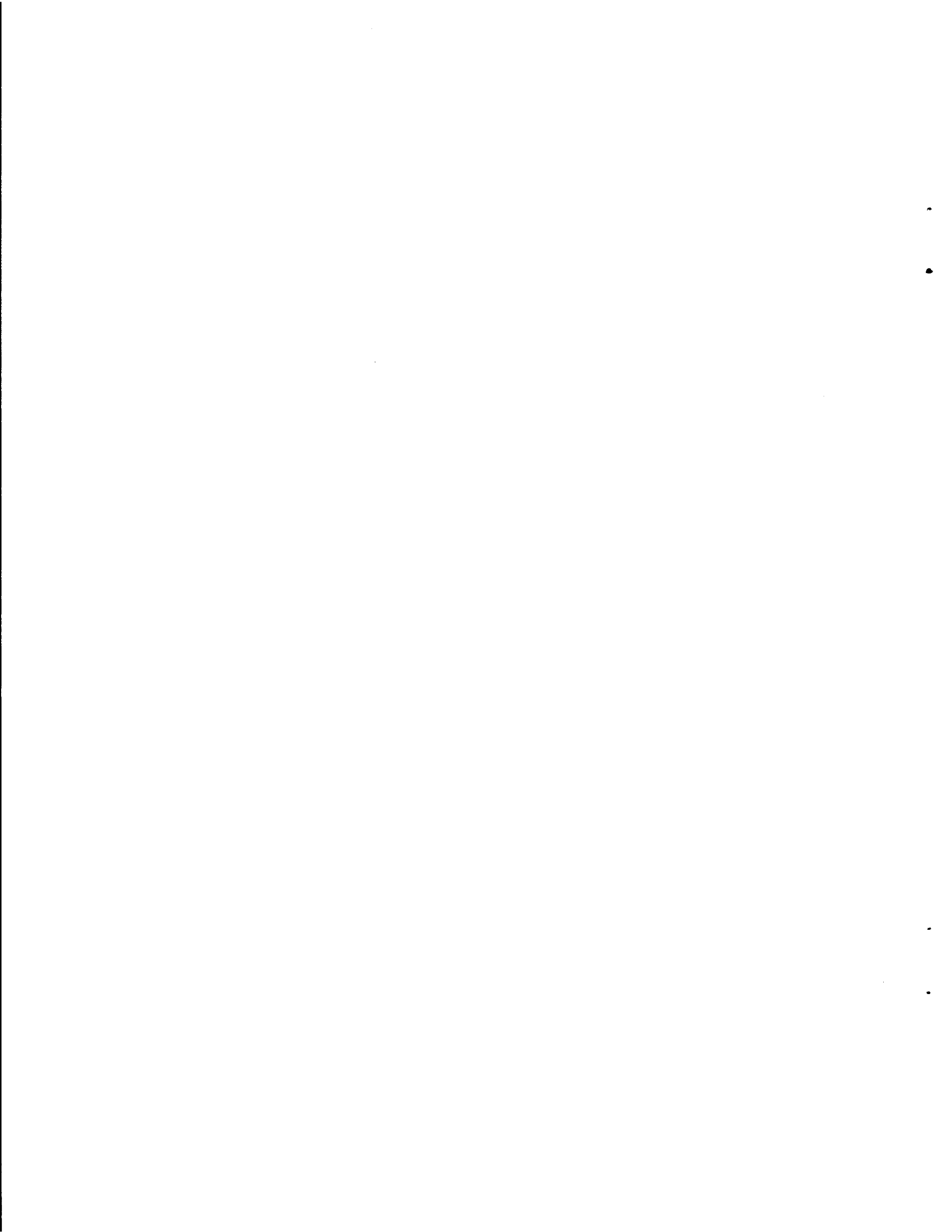
#### **5.3.5.3 Wake**

The speed limit on the Charles River is six miles per hour from Watertown to the Boston University Bridge. From the Boston University Bridge to the locks in Boston or the Cambridge side Galleria, the speed limit increases from six miles per hour to ten miles per hour. A portion of this restriction exists because of the width and depth of the river and the potential for erosion, the other, the recreational activities, especially rowing are extremely susceptible to wake and tipping.

### **5.3.6 ENVIRONMENTAL AND SOCIAL CONSIDERATIONS**

#### **5.3.6.1 Environmental Impact**

Keeping to the speed limit allowed on the Charles River, there would be relatively little or minimal shore erosion caused by a commuter ferry boat. However, due to the fact that some areas of the Charles River are very shallow, one would want to keep in mind that there could be prop wash, disturbing the sediment on the river bottom and redistributing it. This would be caused by water turbulence turning the sediment and releasing it. According to Dr. Gordon Wallace, a chemical oceanographer, there are probably high rates of hydrogen sulfide and ammonia on the river bottom.



Another source of concern would be fueling stations for the boats. Most often spills occur from careless or accidental spills during the fueling process. It would probably be better if the fueling stations were not located on the Charles River but in the Harbor. Asthetically, any structure built should fit in with the natural surroundings so as to blend in naturally, and not be offensive to the eye. The area directly adjacent to the river is considered parkland, so any commuter boat would need to be relatively quiet so as not to disturb those enjoying the park areas, as well as residential areas in the neighborhood.

Environmental considerations include water, air and noise pollution issues. On the one hand, commuter service brings about a reduction in the number of vehicles on the road on any given day which translates to reductions in air pollution, reduction in eventual run-offs into the water system and reduction in noise pollution. When one is out on the river in either a rowing shell or sailing vessel, the disturbance created by a motor vessel can be significant. In addition, the requirement to build facilities to allow this vessel to dock may cause conflict on the landside and may be restricted by environmental regulations and laws. All of these issues will be controlled by local or state authorities and approvals to start service will be required by the State Department of Environmental Protection and the MDC.

#### **5.3.6.2**      Natural Barriers

Weather is a key element to utilization of the Charles River on a twelve month basis. There is a distinct period of time, December to March, when the Charles River can be frozen. The thickness of the ice and the length of time that it remains on the river is of course dependent upon the intensity of the cold. During the 1993/94 winter as an example, Boston has been subjected to sustained cold which not only froze the Charles River, but parts of the harbor. This condition has lasted for over four months. To the end of February, there seemed to be no let up at all.

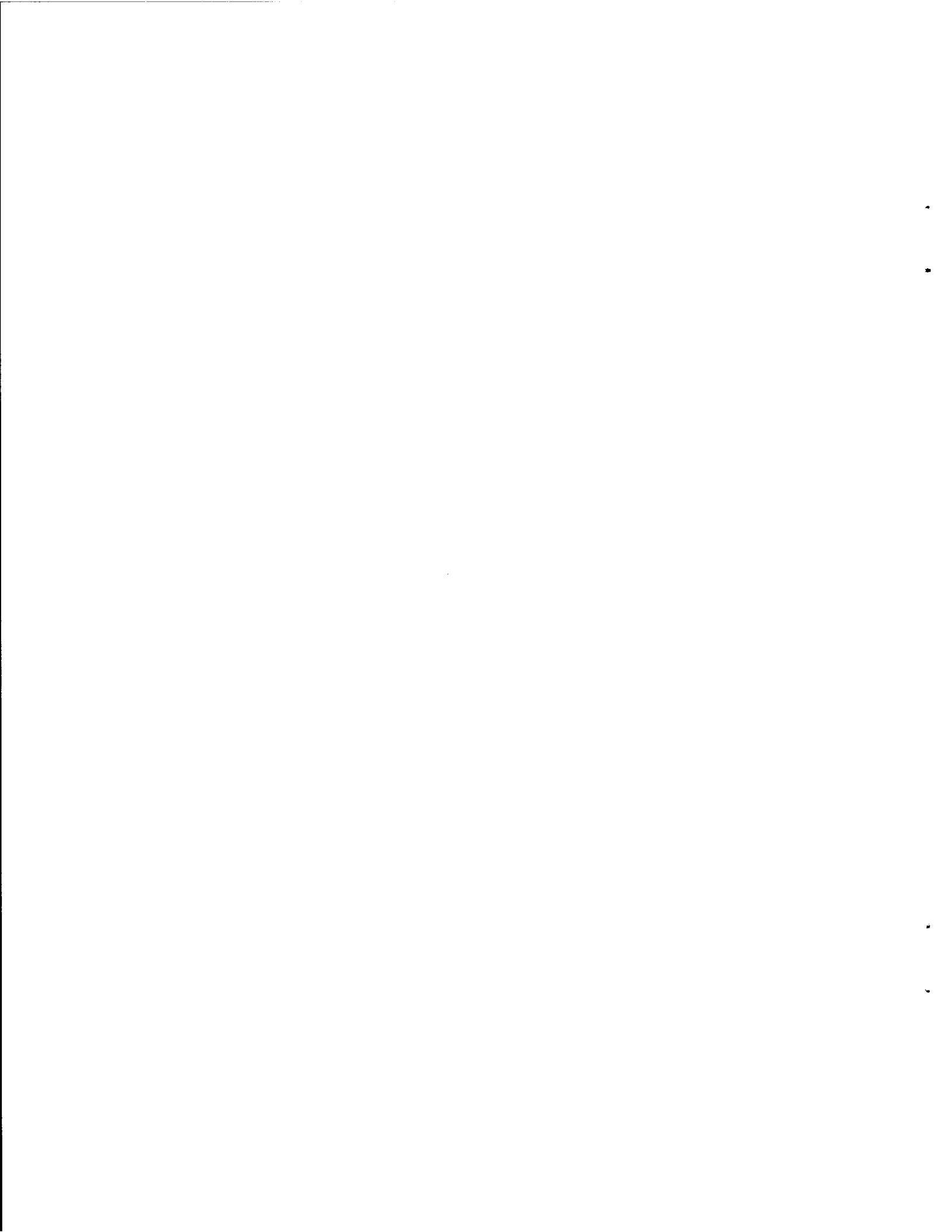
Temperature not only affects the icing conditions on the river, but the psychology of water transportation. The idea of riding on the water to work, waiting along a waterfront area for the arrival of the vessel, all seem to be something better accomplished during the warmer months of the year. Add to this a touch of snow, sleet, freezing rain or rain and the combination is a very difficult one to compete against in a market where there are viable options.

#### **5.3.6.3**      Social Impacts

Judgement of the feasibility of a commuter service from a social standpoint has already been handed down by rowers and sailors alike. Their groups expressed, in a rather adamant manner, their displeasure over the possibility of another commercial motor boat company beginning operation on the Charles.

This service would be especially harmful to them, they indicate, if the company operated during the peak rowing and sailing periods of the day. In actuality, peak commuter times coincide with peak rowing time and in the morning and evening when the commuter vessel would be most active, rowers sailors are out on the Charles in force.

Even a water taxi, not necessarily operating during peak time, would, in the eyes of the recreational boating groups, cause congestion and pose a safety hazard on the river. According to these groups, the water taxi potentially will operate up and down as well as on a cross river course, creating a double threat to the safety of the sailing patrons and the rowers.



Regardless of which direction it travels, a commuter vessel or a water taxi route will be perpendicular to most recreational travel. It is obvious, on a body of water such as the Charles, conflict will be a possibility. In a summation of the words of the owner of the Charles Riverboat Company, a motor vessels must exercise caution and courtesy while operating anywhere and especially on the Charles. This company has proven to be a good neighbor and there seems to be no reason why it could not operate a commuter or water taxi service with the same degree of concern.

The various rowing clubs were asked how they felt about a commuter boat on the river. It proved to be an emotionally packed issue with most of the responses centering upon the safety of yet another powerboat on the river. The size of the boat also seems to be a particular issue. According to some, a boat the size of a commuter boat does not belong on the Charles River, particularly when the up river portion becomes narrower and increases its winding path further up river one travels.

Keeping in mind that most of these comments were from rowing and recreational enthusiasts, it became apparant that many believe that the river should be for rowers and not power boats that pollute as well as cause shore erosion and safety concerns.

According to a number of the rowing coaches, the safety issue is heightened by the fact that the MDC does not really regulate the river. During an event such as the Head of the Charles Regatta or the 4th of July celebration at the hatch, they will keep people away from the racing area or the area of activity. Other than this, the coaches indicate that one rarely sees the MDC on the river.

The rowers indicated that they have tried to persuade the MDC to put bouys on the river to control the vessel activity within specific channels. Motor boats operators filed a petition against the idea and won. At this time, there is a group approaching the Coast Guard to persuade them to take responsibility for regulation of the river, since it is considered navigable waters. The main concern among the rowers is enforcement of the Rules of the Road to increase the safety factor on the river.

### **5.3.7 LANDSIDE BARRIERS**

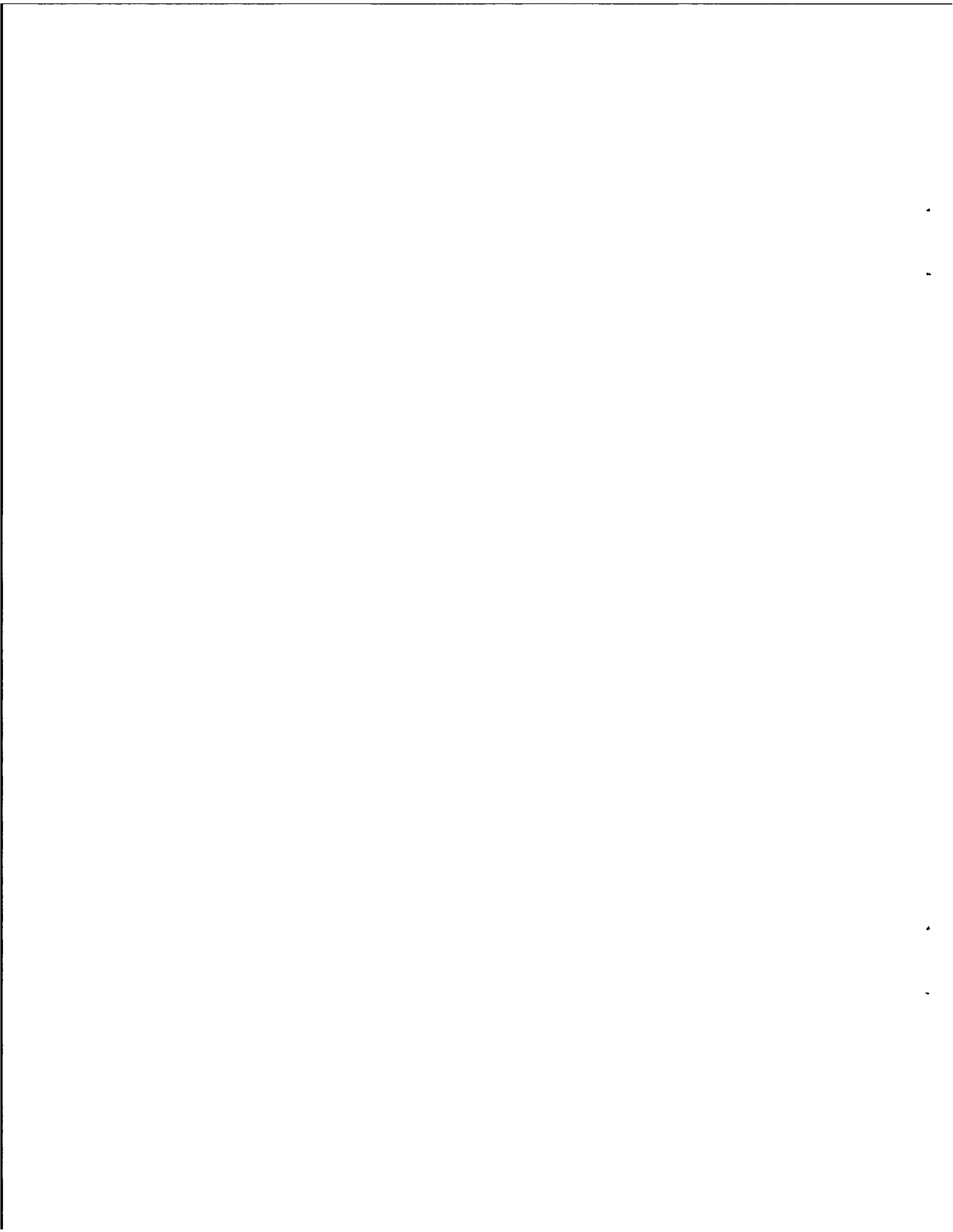
#### **5.3.7.1 Access**

The water commuter's idea of easy landside accessibility includes: access by public transport and/or congestion free automobile routing; safe access and egress from the main traffic artery, adequate parking, easy drop off and pick-up or a safe, comfortable walk from transport or parking to the vessel. Based upon Federal law, (the Americans With Disabilities Act of 1990) barrier free access for those persons with disabilities must also be provided.

#### **5.3.7.2 Docking Facilities**

If, based upon the feasibility, a commuter service were to be implemented, additional docks and terminal facilities would be required as well as a general upgrading of present facilities.

There are five public docks on the Charles River owned by the Metropolitan District Commission. One is located at the end of Fairfield Street in Boston, another at the Union Boat House; another located on the Boston side of the Charles River after the Longfellow bridge before the Hatch Shell; another located directly behind the Hatch Shell, on the Boston side of the Charles River; one at the Emerson Boat Pier, on the Boston side of the Charles River after the Hatch Shell; and there is one located at Christian Herter Field in Brighton located on the Boston side of the Charles River.





There is a dock at the Science Museum and one located at the Galleria. There are also docks at boat houses and marinas that could be utilized. These facilities are controlled by private parties such as yacht clubs, rowing clubs and universities who must seek MDC approval, pay for the facilities, use them but don't own them. Utilization of these facilities would only be possible after discussion with the entities in operational control of them.

The process involved in putting additional docks along the riverbank may be very involved. There are a number of Federal and State environmental interests and permits must be acquired. The Metropolitan District Commission and the City of Boston's Conservation Commission must issue permits as well. The Charles River is considered a navigable waterway and any petitioner for new docking space would also require a permit from the Army Corps of Engineers.

There are many locations among the many we have listed that do not have docking facilities adequate enough to handle commuter traffic. Daley Field, the Hyatt Regency Hotel, and the Lars Anderson Bridge leading to Harvard Square do not have any facilities. Most of the facilities we observed are in need of some degree of repair or renovation.

Ferry docking facilities must be safe and accessible. Commuter and water taxi services proposing to operate daily and for as many months of the year as possible, may be required to provide some form of protection for the passengers from the elements.

There are different types of dock designs available. The best design for the purposes of this study is a floating dock with a hinged access ramp. The cost of a new thirty foot floating dock would be approximately \$10,000 to \$15,000. The cost of a used floating dock would be approximately \$5,000. These docks are made from cement and floatation materials. The ramp and dock facilities should have railings, non-slip surface and consider a canopy arrangement for protection against the weather. The surface should be wide enough to accept a wheelchair, with enough area to turn the chair as well. (In this case, care must be taken to gain the correct ramp angle in accordance with ADA regulations.)

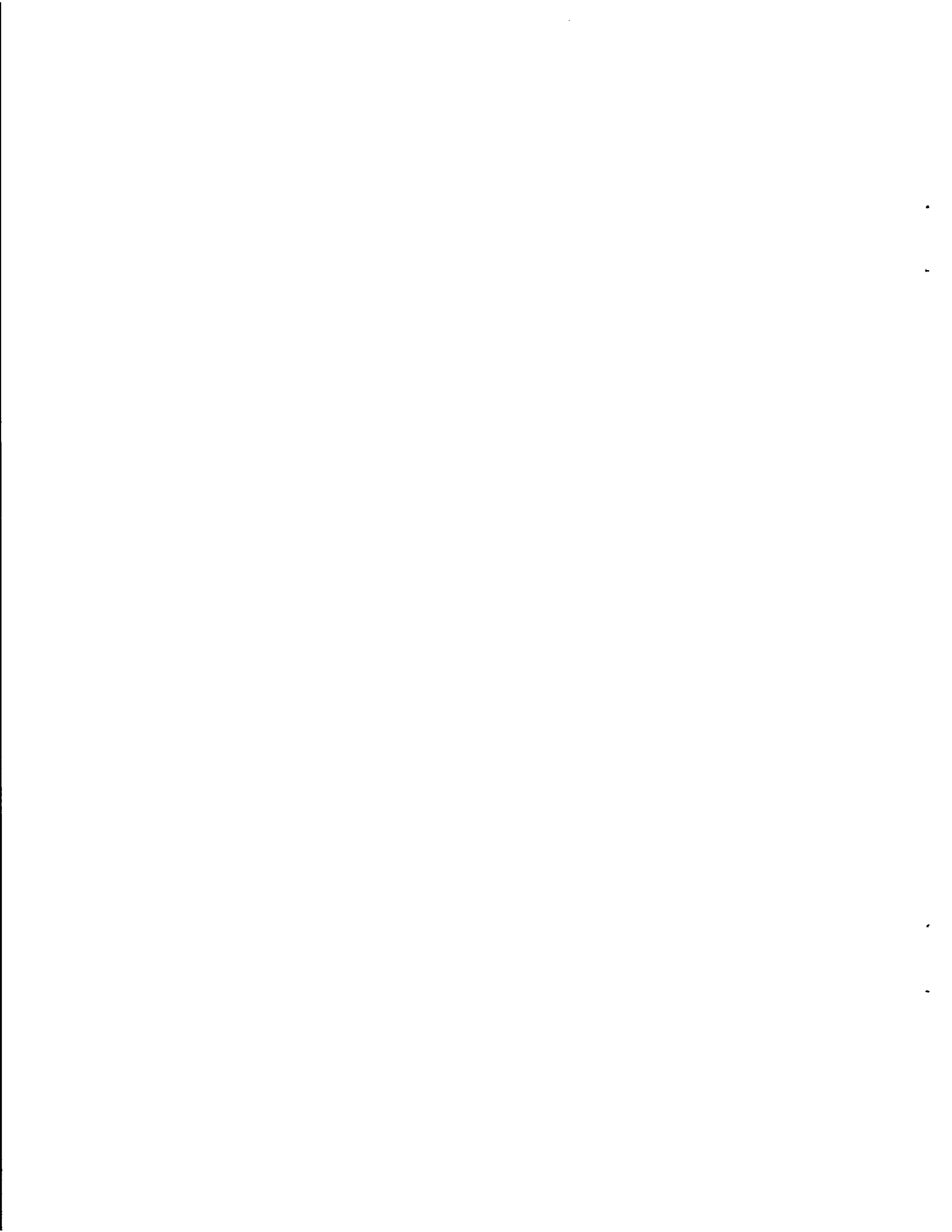
### **5.3.7.3**      Parking

As previously mentioned, there is parking at Daley Field and Christian Herter Field. However, once you get further down river toward Boston and Cambridge, there is little parking available near the river.

There are no parking spaces at all on the Boston side, along Storrow Drive other than off street parking some distance from the river. On the Cambridge side of the river, along Memorial Drive there are a limited number of spaces available. On Memorial Drive from a point just east of Western Avenue, there are small MDC facilities with limited parking. There is parking at the Cambridge side Galleria and in the vicinity. Most of the hotels have parking for guests with limited overflow and little for the public.

Once you get into Cambridge and Boston and venture further away from the river, there are parking garages that charge from \$3.00 to \$10.00 or more for the day and meters with a two hour limit. There, accessibility to the river is limited.

For commuter service it is doubtful whether parking would be required in Cambridge or Boston since most of the patrons will be coming from the West. For the water taxi service, it is also doubtful whether parking in the areas closer to Boston and Cambridge would be necessary, however, knowing what parking is available or arranging for a small amount, might be valuable as a marketing tool.



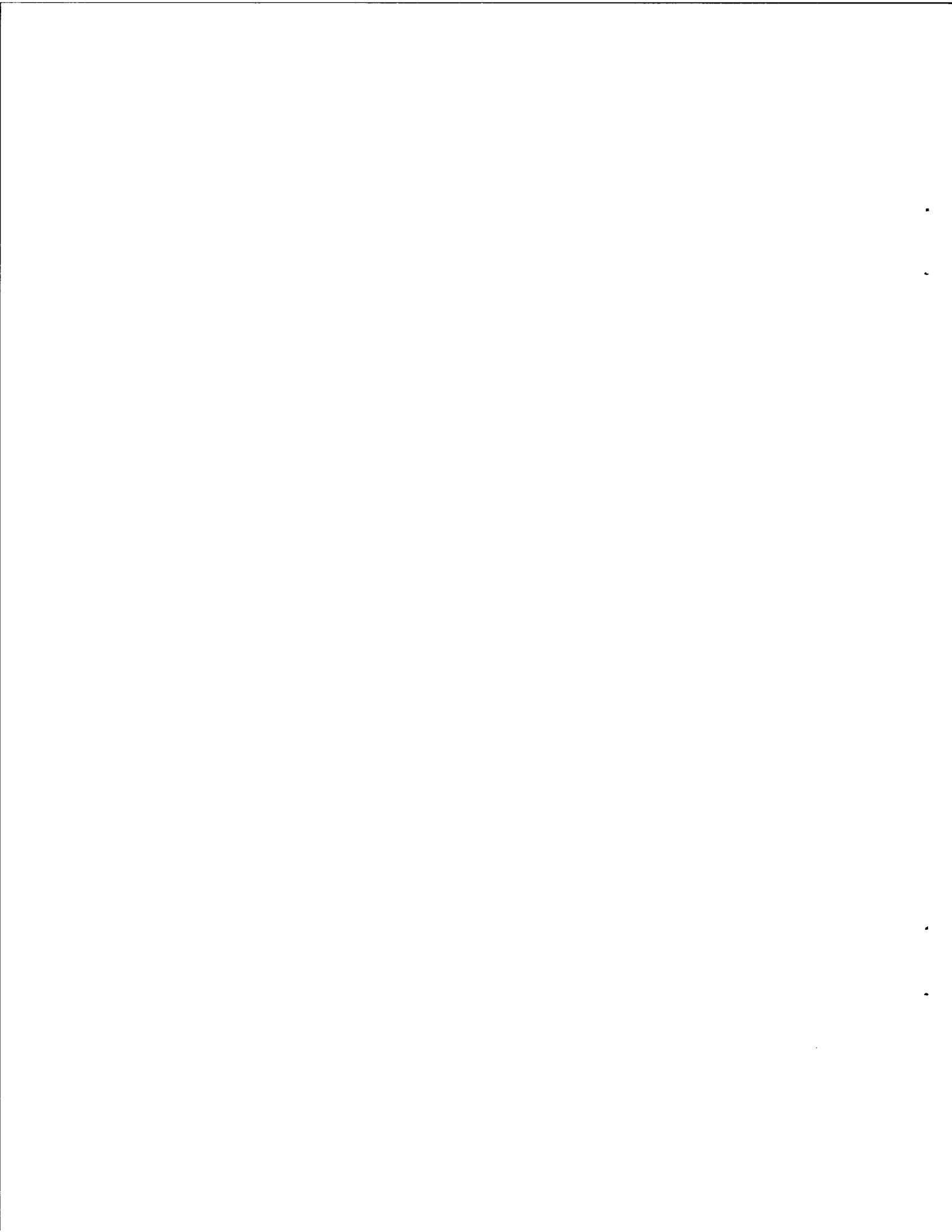
At Daley Field, there are 118 parking spaces located at the boat ramp. Since this is a primary public boat launch, cars that park there during the boating season often have a trailer attached, taking up two parking spaces. Contacts at the MDC responded negatively to the idea of all day commuter parking at this location, however, this was not an official rejection.

There is a parking lot adjacent to the Metropolitan District Commission skating rink which is close to the boat ramp. This lot has 57 spaces. The Metropolitan District Commission indicated initially that they would not be interested in allowing parking here for commuters. When the parking lot is not being used by skaters, it is being used by the community rowing patrons. There is a football field that separates these two parking lots.

At Christian Herter Field, there are 240 spaces. This lot is also owned by the Metropolitan District Commission and is open to the public. The Metropolitan District Commission would be more open to allowing parking on this lot than the former two lots. A start-up commuter service must consider the importance of a parking lot for commuters regardless of where they propose to begin service.

#### **5.3.7.4**            Intermodal Connections

Ideally, intermodal connections should be available at both ends of the voyage or in close proximity of each stop. Intermodal connections consist of bus, train or shuttle vehicle, available for a direct interchange between transit modes. In this case, the continuation of the movement of passengers would be between ferry and bus, rail or train. In virtually all cases involving both the commuter and the water taxi stops along the Charles River, the access to intermodal connections is extremely poor and must be addressed. Transfer to and from a waterborne service requires an additional time element that may discourage potential customers.



## **5.4 FINANCIAL CONSIDERATIONS**

### **5.4.1 Expenses**

#### **5.4.1.1 Capital Expenses**

Whether the service is started by a new operator or by the existing excursion/tour company presently operating on the river, at least one new vessel will most likely be supplied to support a commuter run. This vessel can be designed with a total capacity of either 49 passengers, 100 passengers or 150 passengers. For the purposes of our analysis, we have elected to consider vessels with 49 and 100 passenger capacity. This seems to be compatible with potential market levels. Vessels utilized for water taxis can have a capacity of 49 people or less.

Vessel pricing ranges from \$169,500.00 to \$499,000.00 per vessel. This price range provides a selection of vessels from a straight forward water taxi to a sophisticated European canal boat, a design popular in cities such as Amsterdam and Paris. All of the prices will vary, depending upon the final design, selection of options and time of purchase.

Commuter vessels tend to be comfortable, yet rugged and practical, based upon the service in which they will be engaged. If the operator intends to market additional services with the same vessel, (luncheon excursions, dinner cruises, river tours, etc.) the vessel's design may be adjusted accordingly. The analysis of expenses below is based upon financing 80% of the cost of the vessel, amortized over an eight year period, at 10% interest.

NOTE: Vessel owners indicate that amortization schedules will differ based upon who provides the financing. The length of time a bank will allow for payback is eight years versus other vessel financing resources, ten years. The interest rate we utilized could be on the high side. This should be taken into consideration during any final financial planning.

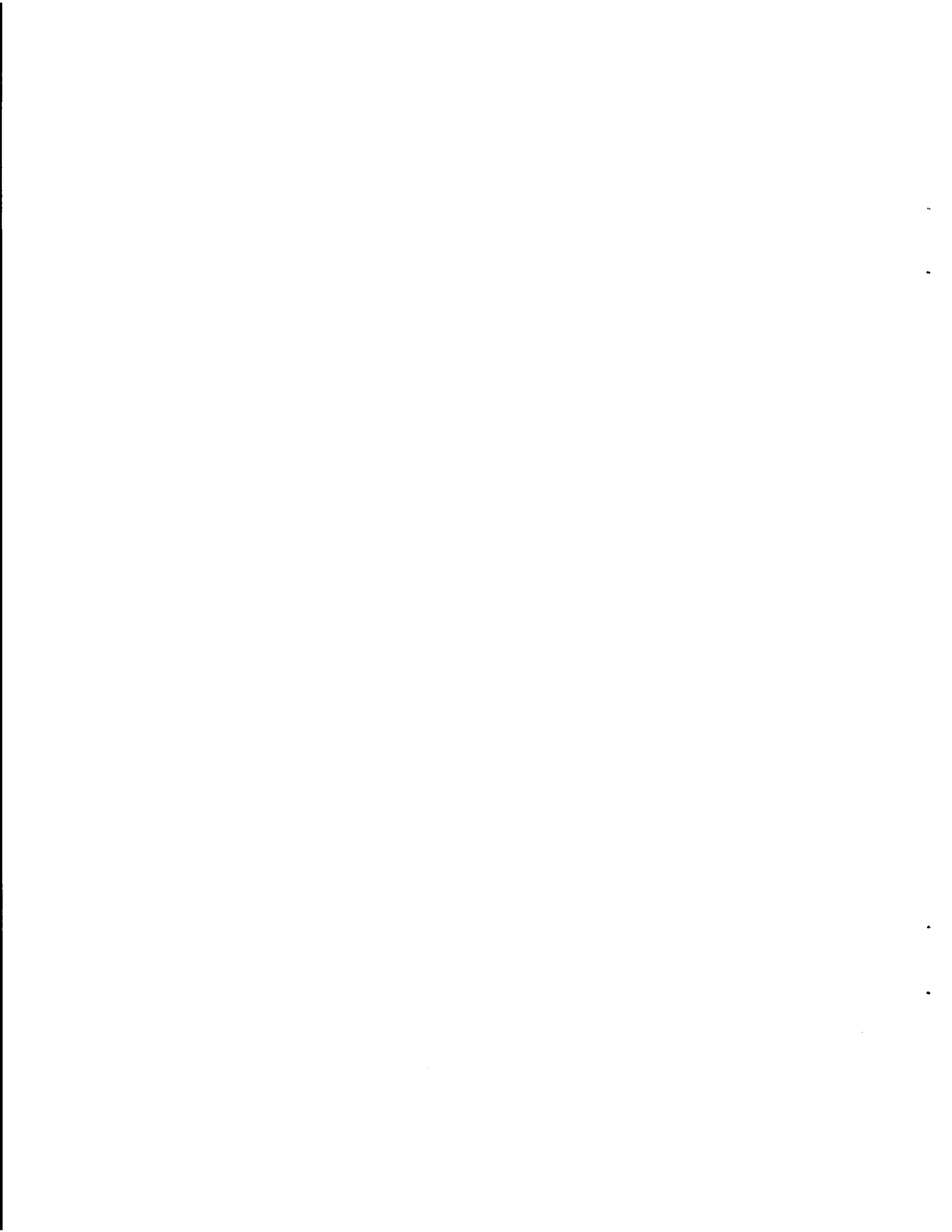
A cost factor has also been established for the docking facilities that will be required. It has been anticipated that three new docks will be required for a commuter service. The number of docks that must be installed or the number of present facilities that may require repair to establish a water taxi service is unknown. The number of docks for water taxis would be controlled by the locations that the taxi would serve.

We have estimated each dock to cost \$15,000.00 new and have incorporated that cost, multiplied by three, into the capital investment analysis. This figure has also been amortized over eight years at 10% interest. The cost will vary depending upon the design selected.

#### **5.4.1.2 Operating Expenses**

Operating expenses have been calculated on an annual basis with captain, crew, personnel benefits, insurance, operations expenses (fuel and maintenance), administrative and marketing and sales costs.

We have also estimated that start-up expenses will be incurred including: legal fees, applications and permits, inspection fees and engineering and design fees. These we have estimated to be approximately \$150,000.00. It is difficult to determine how or where this expense should be dealt with within the financial plan, however, we have included it in the annual budget based upon a five year payback. An operating company may wish to deal with this expense differently.



### 5.4.1.3 Expense Estimates

VESSEL CAPACITY	49 PASS	100 PASS	49 PASS	49 PASS	100 PASS	100 PASS
<b>CAPITAL EXPENSES</b>						
VESSELS	\$135,600	\$156,000	\$160,000	\$212,800	\$240,000	\$399,200
DOCKING FACILITIES	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000
<b>TOTAL CAPITAL EXPENSE</b>	<b>\$32,885</b>	<b>\$36,600</b>	<b>\$37,328</b>	<b>\$46,943</b>	<b>\$51,896</b>	<b>\$80,884</b>
<b>OPERATING EXPENSES</b>						
<b>PERSONNEL</b>						
CAPTAINS (1)	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
CREW (1)	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
BENEFITS	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
INSURANCE	\$6,000	\$12,000	\$6,000	\$6,000	\$12,000	\$12,000
FUEL OIL	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
MAINTENANCE	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
ADVERTISING	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
OFFICE STAFF	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
OFFICE RENT	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000
ELECTRICITY	\$450	\$450	\$450	\$450	\$450	\$450
TELEPHONE	\$7,200	\$7,200	\$7,200	\$7,200	\$7,200	\$7,200
<b>TOTAL OPERATING EXPENSE</b>	<b>\$130,650</b>	<b>\$136,650</b>	<b>\$130,650</b>	<b>\$130,650</b>	<b>\$136,650</b>	<b>\$136,650</b>
<b>START UP COSTS*</b>	<b>\$38,244</b>	<b>\$38,244</b>	<b>\$38,244</b>	<b>\$38,244</b>	<b>\$38,244</b>	<b>\$38,244</b>
<b>COMBINED ANNUAL EXPENSE</b>	<b>\$201,779</b>	<b>\$211,494</b>	<b>\$206,222</b>	<b>\$215,837</b>	<b>\$226,790</b>	<b>\$255,778</b>
<b>AVERAGE MONTHLY EXPENSE **</b>	<b>\$16,815</b>	<b>\$17,625</b>	<b>\$17,185</b>	<b>\$17,986</b>	<b>\$18,899</b>	<b>\$21,315</b>
<b>AVE. ANNUAL PER PASS COST***</b>	<b>\$4,118</b>	<b>\$2,115</b>	<b>\$4,209</b>	<b>\$4,405</b>	<b>\$2,268</b>	<b>\$2,558</b>
<b>AVE DAILY PER PASS COST****</b>	<b>\$21</b>	<b>\$11</b>	<b>\$21</b>	<b>\$22</b>	<b>\$11</b>	<b>\$13</b>
N.B. -						
* - FIVE YR AMORTIZATION						
** - ANNUAL EXPENSES DIVIDED BY 9 MONTHS						
*** - ANNUAL COST DIVIDED BY PASSENGER CAPACITY						
**** - ANNUAL PASSENGER COST DIVIDED BY 198 ( 9 MOS X 22 DAYS PER MONTH) OPERATING DAYS PER YEAR						

fig 5.2

### 5.4.2 Passenger Costs

We have calculated the per passenger costs based upon an extremely conservative approach to the volume of passengers over a year's period. Utilizing our calculations, the range of cost on a per passenger basis is from \$2,115 to \$4,405 per passenger per year. The lower of the two numbers was calculated by dividing the capacity of the vessel (100 passengers) by the combined annual expenses. The higher of the numbers uses 49 passenger capacity. The combined passenger expense is the total of the capital expense, the operating expense and the start-up costs

We have also calculated a daily cost per passenger. Assuming 198 days per year ( nine months per year @ 22 days per month) and a daily passenger volume equal to one round trip with the vessel running at 50% capacity each way, the range of cost, (allowing the operator enough cushion to carry his monthly expenses over the three months that the service will be idle), are from a low of \$11.00 per passenger per day to a high of \$22.00 per passenger. (It has also been pointed out that depending upon where the take-off point is located, a vessel could make either one or two trips each way. The more trips made, the less cost per passenger).





**Cost Per Passenger - 49 Passenger Vessel Capacity**

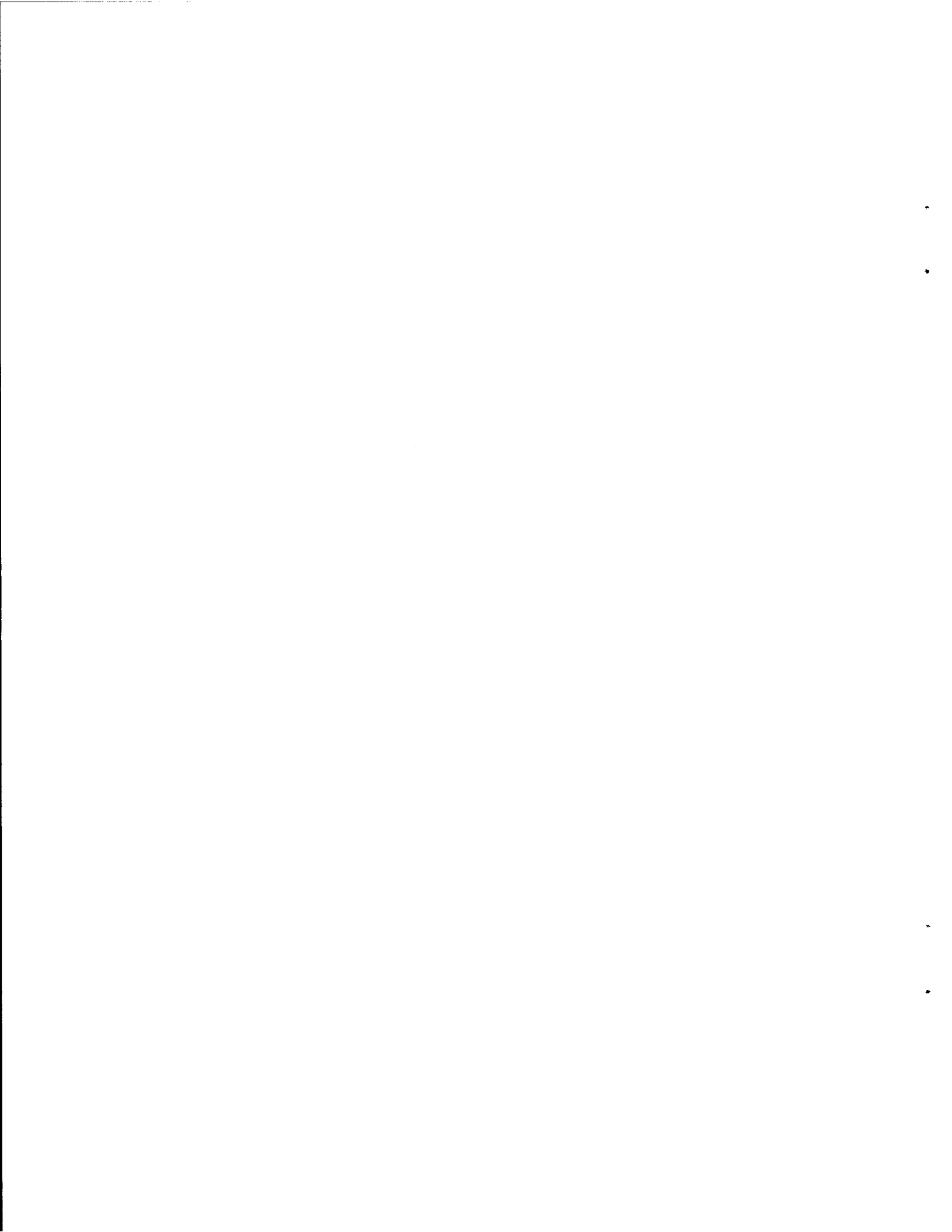
Daily Passenger Volume	Cost per Passenger		
	TYPE A	TYPE B	TYPE C
49	\$21	\$22	\$23
60	\$17	\$18	\$19
75	\$14	\$14	\$15
90	\$12	\$12	\$10
105	\$10	\$10	\$11
120	\$9	\$9	\$10
138	\$8	\$8	\$8

fig 5.3

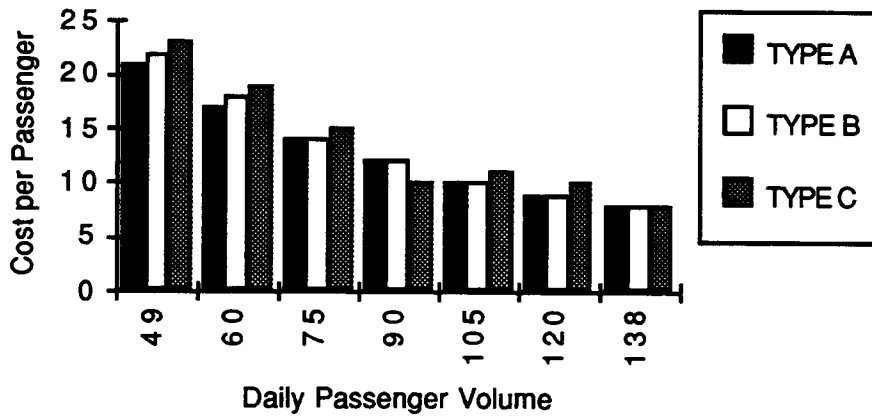
**Cost Per Passenger - 100 Passenger Vessels Capacity**

Daily Passenger Volume	Cost Per Passenger		
	Type A	Type B	Type C
100	\$11	\$12	\$13
130	\$9	\$9	\$10
145	\$8	\$8	\$9
160	\$7	\$8	\$9
175	\$7	\$7	\$8
190	\$6	\$7	\$7
205	\$6	\$6	\$7

fig 5.4

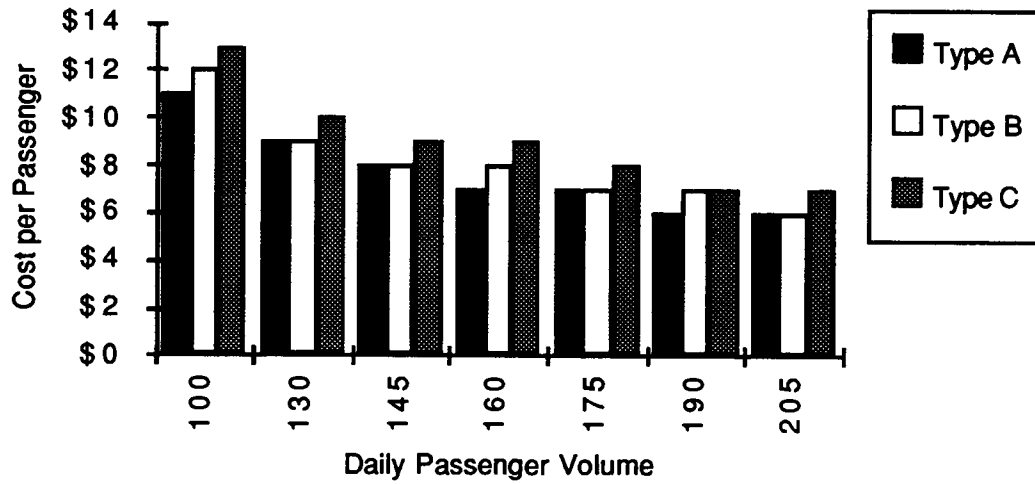


### 49-Passenger Capacity Vessel



Graphic 5.1

### 100-Passenger Capacity Vessel



Graphic 5.2



### **5.4.2**            Passenger Revenues

The operator's capability to generate sufficient revenues to operate a non-subsidized service will depend upon the ability to capitalize upon the market available and maximize the capacity of vessel. In a situation where the operator can fill the vessel for one round trip per day and set his fares according to his expenses, he could operate marginally on a non-subsidized basis. If he was to generate two round trips per day, his finances will adjust accordingly. If the operator must operate under the pressures of low market response and/or rates equal to the landside competition without market support, he will require subsidy.

Based upon the expense calculations above (fig 5.4.), a service can be operated with a new vessel for between \$764.00 to \$968.00 per day based upon a 22 day month. If the service provided one round trip per day and sailed at 50% of passenger capacity, a charge of \$5.50 each way would meet daily operating expenses. This calculation is based upon 100 passengers paying a round trip fare.

### **5.4.3**            General Revenues

Additional sources of revenues are available to vessel operators during the operating season. During a commute to and from work, refreshments, newspapers and other miscellaneous items can be sold to generate additional revenues. Since the vessel is operating a morning and evening commuter run five days per week, day excursions, evening tours and dinners and weekend services can be planned. These activities can relieve revenue shortfalls created by low commuter volumes or insufficient rate levels. In this case, a public subsidy could be avoided.

## **6.0**            **CONCLUSIONS**

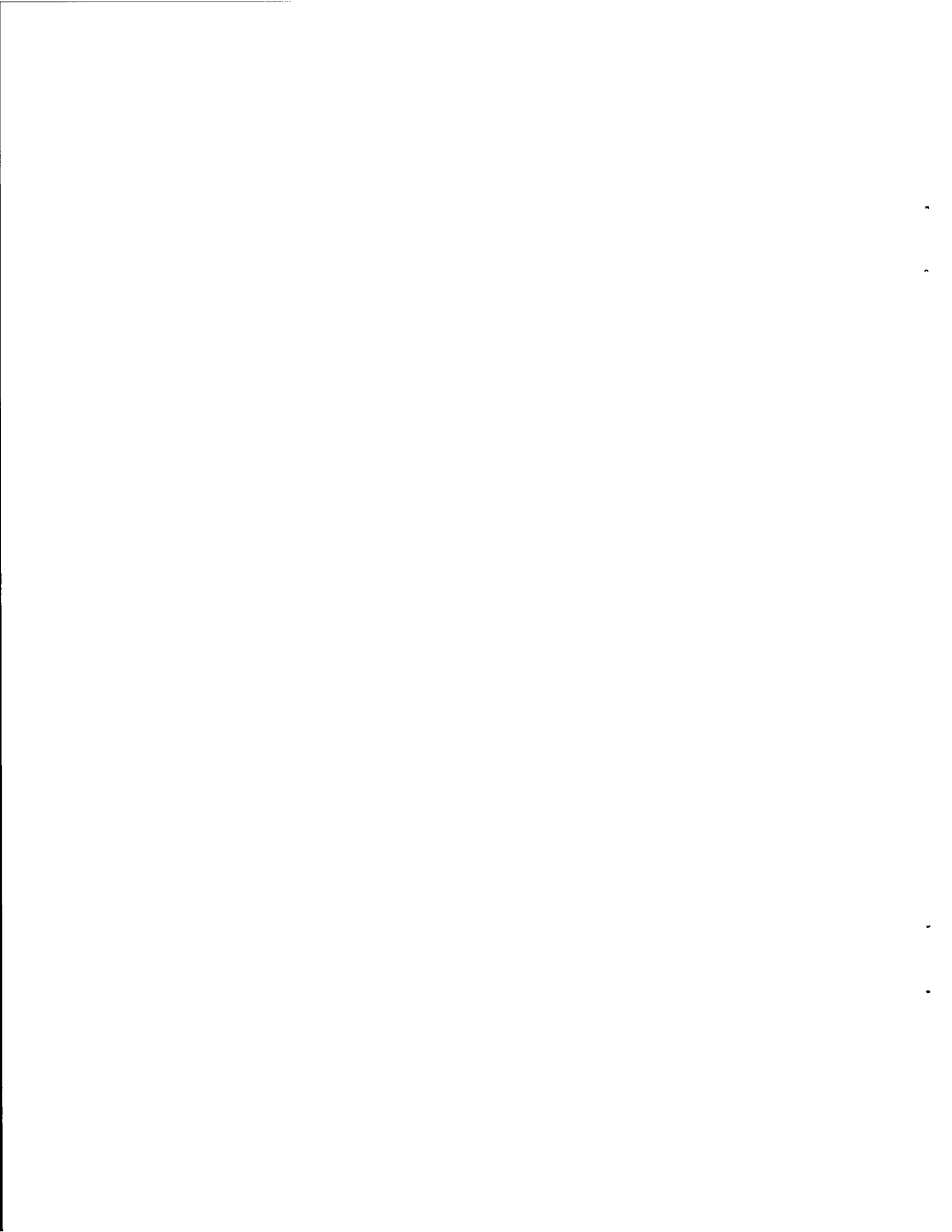
### **6.1**            **THE FEASIBILITY OF WATERBORNE TRANSPORTATION SERVICE ON THE CHARLES RIVER**

It can be concluded that waterborne commuter ferry or water taxi transportation along the Charles River is feasible, as is almost anything that has the correct mixture of elements to make it work. The question is, in the case of the Charles River Commuter Ferry, are the correct mixture of elements there?

The parameters governing the answer to this question will be a combination of the availability of market support, the correct financial mix and the operational fit which will include the five decision making elements that are essential when a commuter makes the choice of the mode of transportation he or she wishes to utilize.

#### **6.1.1**    Market

Based upon sheer numbers, the market can support a daily business commuter ferry from a point in the Newton, Waltham and Watertown area. All of the suburban markets analyzed in this report, and potentially a number of additional markets, would contribute totals upon which a commuter service on the Charles River could draw and survive. Based upon State figures, the Waltham, Watertown and Newton areas have more than the normal percentages of commuters using public transport and the major portion of the draw for ferry service would more than likely come from this segment. A percentage of the commuting public traveling to work in private auto or vehicle pooling may also be converted to water transportation but it is anticipated that the volume may not be enough to make a dent in present traffic congestion levels.



The marketing data we used to formulate our final conclusions have come from three sources: the survey conducted by UHI, statistical information provided by census reports and the MBTA's statistical Blue Book. Each source of information was based upon the total daily commuters from Newton, Waltham and Watertown, by specific origin and method of commute.

A large percentage of the respondents to the UHI survey were full time public transit users. They indicated that they would consider water transportation if it was available. The significance of these responses, however, should be considered with the understanding that these commuters did not have details on the elements of a transit service that they would normally require to make an informed decision- schedule, frequency, reliability, cost or trip time.

Assuming a very conservative .05% share, (1/2 of 1 percent), of the total commuter market from this area, (private motor vehicles and all of the four forms of public transit), a total of 202 commuters would be available on a daily basis for ferry transit to all points along the Charles. Based upon this approach, approximately 143 Boston commuters, .05% of the total of those traveling via automobile and public transit to Boston, could potentially support a commuter vessel service to Boston alone.

If the "prophecy" is correct (page 26, paragraph 4.3.1.5) in stating that most of the competition for waterborne commuter business will come from public commuting modes, a .05% share of the public transit totals from Waltham, Watertown and Newton to both Boston and Cambridge, results in approximately 93 passengers per day (186 round trip) for waterborne commuting. This would be enough to support a 100 passenger capacity vessel stopping in both Boston and Cambridge on a single run in the morning and a return run in the evening.

The MBTA has reported that approximately 7% of the commuters from the Hingham area utilize water transportation. The report also indicates that smaller percentages come from surrounding communities to use that service and the percentages go down in proportion to the distance of the communities from the origin of the service.

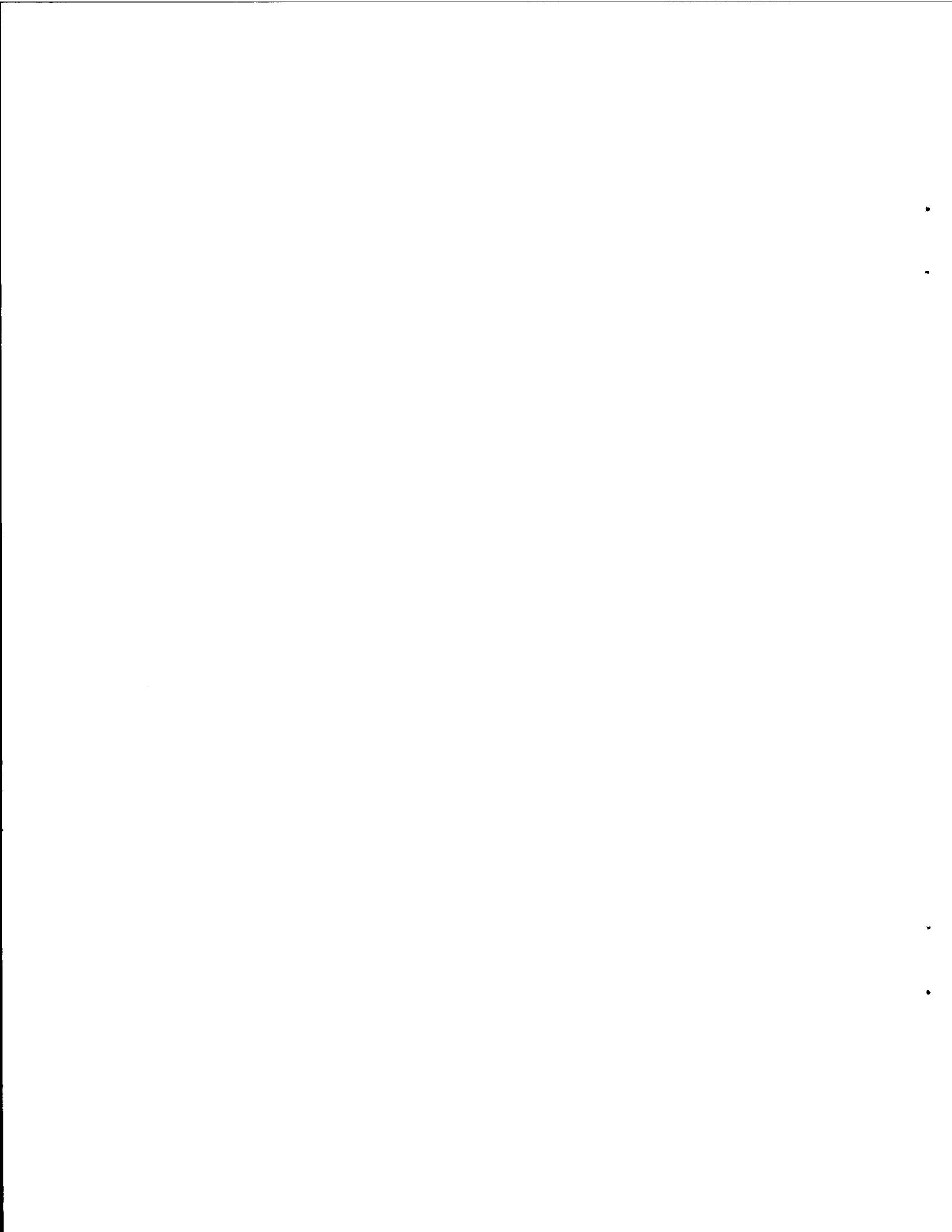
We could therefore expect that support of this ferry system must come from the local communities of Newton, Waltham and Watertown. Support from surrounding communities would only serve to supplement the service passenger volumes and in a negative vein, potentially create additional vehicle traffic through the Newton Community as they access the ferry.

### 6.1.2 Charles River Commuter Service Versus the Five Commuter Decision Making Elements.

**Comparison of Decision Elements**

<b>Decision Element</b>	<b>Competes/Does Not Compete</b>
Cost	Does not compete with public transit on a stand alone basis. Does compete with subsidy
Time	Does Not compete
Convenience / Reliability	Does Not compete
Comfort	Can compete
Social Enjoyment	Can compete

fig 6.1





### **6.1.2.1**      Cost

Traditionally, subsidized ferry services have kept their rates at a level which would compete favorably with other forms of public transportation in the area. The difference between actual cost and competitive rates in the case of a private operator under contract to a public agency, is usually made up by a public operating subsidy. In the case of an operating public entity, shortfalls will be folded into the budget as a deficit.

In the case of a Newton to Boston water transit system, the existence of a subsidy would be imperative to the success of a ferry commuter service unless the market provided overwhelming daily passenger support. The maximum one way fare in the face of public competition would have to be \$3.13 one way, the rate equal to the MBTA charge from Riverside. This includes one way transportation and parking. The commuter rail fare from Newton and Waltham is currently \$2.25 one way and bus fares range between \$1.50 to \$2.25. The ferry service would be more expensive than both of these.

Estimates of the maximum one way auto costs from Newton, Waltham and Watertown into Boston and Cambridge is \$7.43 which includes auto costs, tolls and parking. A ferry commuter service would compete at this level.

The cost of operating a ferry commuter service from this market area to Boston with minimum market support, would be approximately \$5.50 to \$11.00 per passenger one way. The difference between this cost and the minimum and maximum chargeable public mass transit rates would be an increase in a commuter's cost from \$4.00 to \$7.87, one way.

### **6.1.2.2**      Time

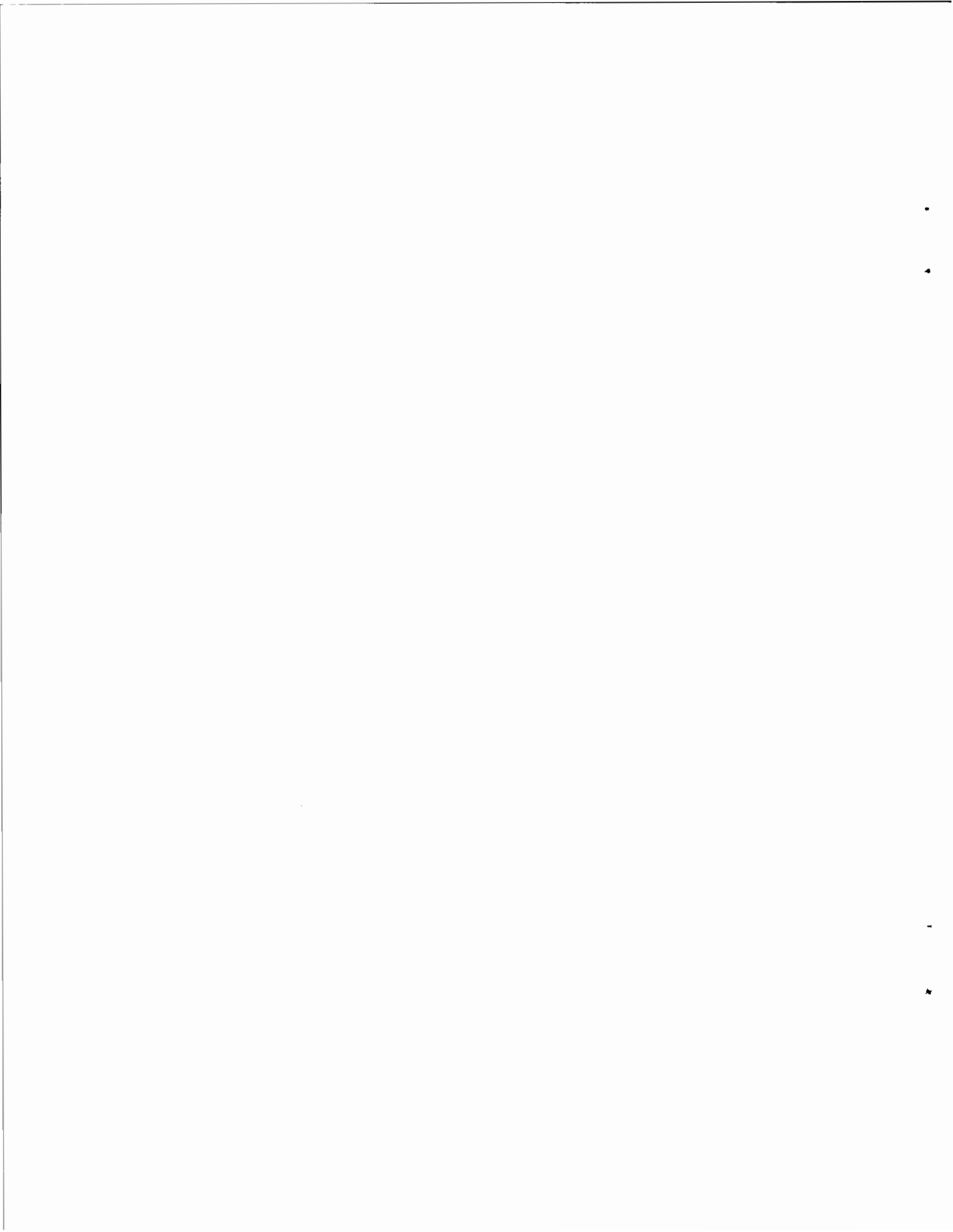
Time can impact positively or negatively on the success of a ferry commuter operation and the amount of the fare that a carrier is able to charge. Although there is a limit, timely service, with reasonable but higher rates, (higher than other forms of mass transportation) is a combination that many ferry experts find irresistible to their most supportive commuters. In this case, time makes a ferry service on the Charles difficult to justify.

The three major factors that will impact the operating time element with respect to ferry commuting are: (1) The driving distance from the commuter's residence to the point of embarkation (2) The time of the actual water commute and (3) If there is to be another intermediate transport phase, the distance to an intermodal point after the commuter debarks from the ferry.

Studies indicate that commuters normally will accept a trip from residence to vessel or other source of transit that does not exceed fifteen minutes. The time of the total commute must be competitive with other commuting possibilities including private automobile.

Commuting from Newton, Waltham and Watertown by bus can take as little as 11 minutes from Watertown to Boston and 42 minutes from Boston to Waltham via evening return bus. The average auto commute from Newton, Waltham and Watertown to Boston is 22 minutes.

The survey taken by UHI indicated that approximately 39% of the commuters from these three areas spent from 16 to 30 minutes to get to work while 38% indicated that it took them 31 to 60 minutes to get to work. Over 46% of the respondents indicated that they would use waterborne transit if they could get to work in 30 to 40 minutes.



Waterborne commuting from the Newton, Waltham and Watertown areas would take approximately 35 to 55 minutes on a non-stop route from the MDC facility on Nonatum Road to Boston and 30 to 35 minutes from the Christian Herter Park on Soldiers Field Road to Boston. Both of these sites are within fifteen minutes of each of the market areas. If stops are established along the river, a minimum additional time of two to three minutes must be added per stop.

The problems with time in this case are not due to technology but speed restrictions established by local public agencies controlling the river. Speed restrictions are related to both physical features of the river and more importantly, social issues such as safety and environment. Higher vessel speeds are attainable technologically. Even using the vessels designed for the Charlesriver Boat Company at higher cruising speeds would cut this travel time by at least one third.

It is evident by the level of the recreational population using the river and by comments from the rowing and sailing organizations contacted that support these activities, that a company operating a commuter vessel on the river would not easily assimilate at any speed. If allowed, vessel operations would be watched closely and the service would have to adhere to the posted speed levels at a minimum.

**NOTE:** Commuter schedules will coincide with the busiest rowing and sailing schedules and traffic will be experienced virtually the entire length of the trip from Newton to Boston. Due to the numbers of people on the river, it seemed to be generally accepted that vessels will more than likely not be able to operate at the posted speeds along the river during the morning and evening commuting.

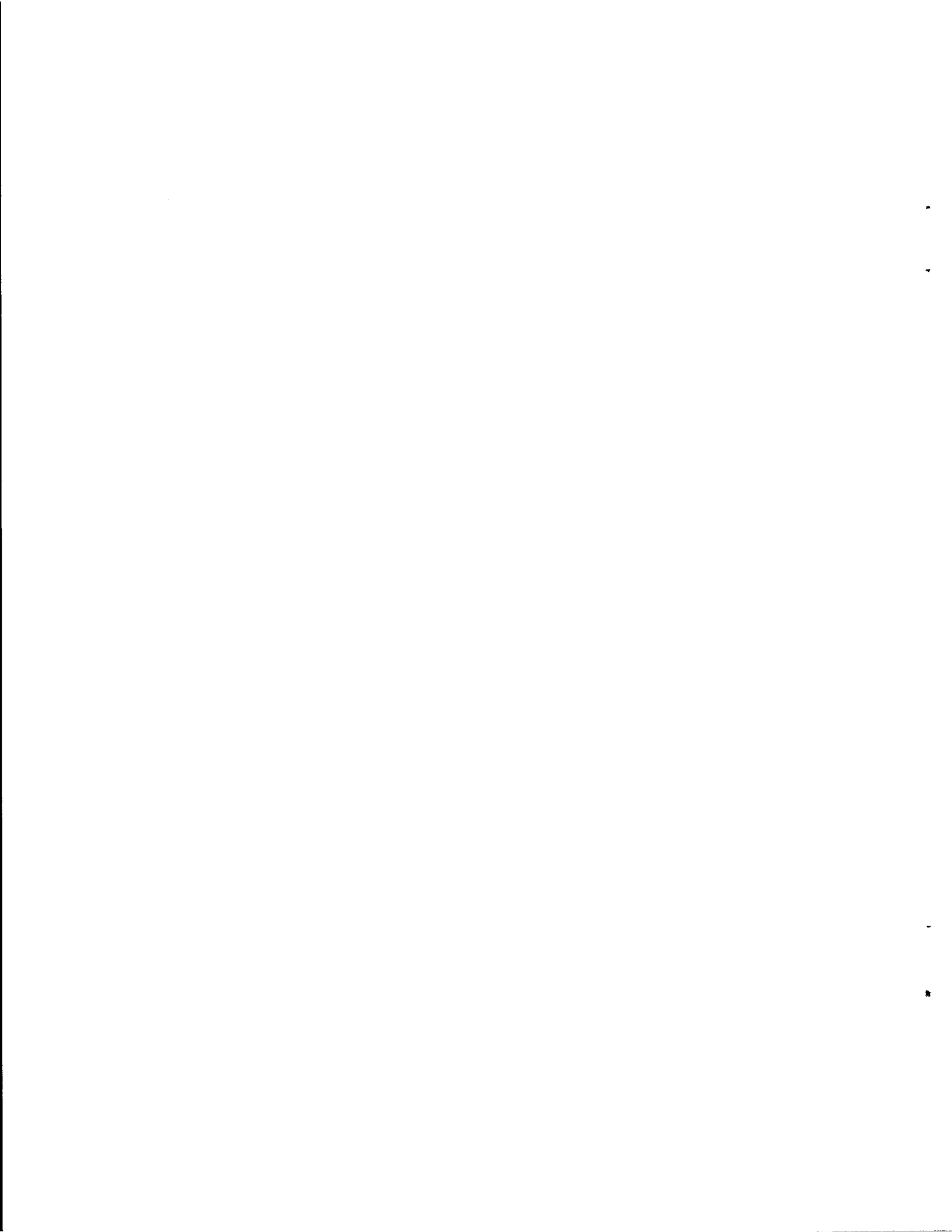
### **6.1.2.3**     Convenience/Reliability

Time also impacts the element of convenience. The length of time it takes one boat to travel round trip on the Charles from Newton to Boston may restrict the service to one run in the AM and one in the PM hours. Even a schedule offering two runs during each commuting period may make the service inconvenient for a large percentage of the commuters. Commuters like to have as many options as possible, especially for the return run.

Convenience also relates to the location and access of embarkation and debarkation facilities. Availability of intermodal connections at the origin or destination for those who will not be close enough to water at either location to walk, is critical.

Reliability is also a question mark for this service due to some uncertain, but real natural barriers. Given a winter experience such as the winter of 1993/94, the Charles River would be impassable for a fairly significant number of winter months due to ice. In the absence of ice, severe weather would also preclude operation. While the river usually freezes during some portion of every winter, this particular season has been unusually severe. It is estimated that a commuter service would be operated a maximum of nine months per year and this on-again off-again commuter service would be unacceptable to most regular commuters.

Ferry commuters are a small, but loyal group in the Boston area and must know that they will be able to commute to their destination everyday and return that evening. The Charles River will not offer this opportunity on a reliable basis.



#### **6.1.2.4 Comfort**

With a question mark only relating to the dock areas at this time, a commuter service on the Charles should be able to provide as comfortable a commute as any of the modes now in existence. Offering amenities such as enclosed heated cabin areas, seating, restroom facilities, snack and refreshment areas, newspapers and a relaxed on-water atmosphere may be the area where waterborne transportation actually excels.

#### **6.1.2.5 Special Enjoyment**

Special enjoyment is also an area where water transportation will maintain an edge over other modes with the exception possibly of passenger rail. Selection of a mode of commutation based upon the element of special enjoyment is a matter of personal attitude and perception. A touch of the love of the sea also creeps in. Again, a Charles River commuter service could provide this special enjoyment factor and on this basis would compete extremely well. Quantifying this element on a general basis is extremely difficult.

### **7.0 RECOMMENDATIONS**

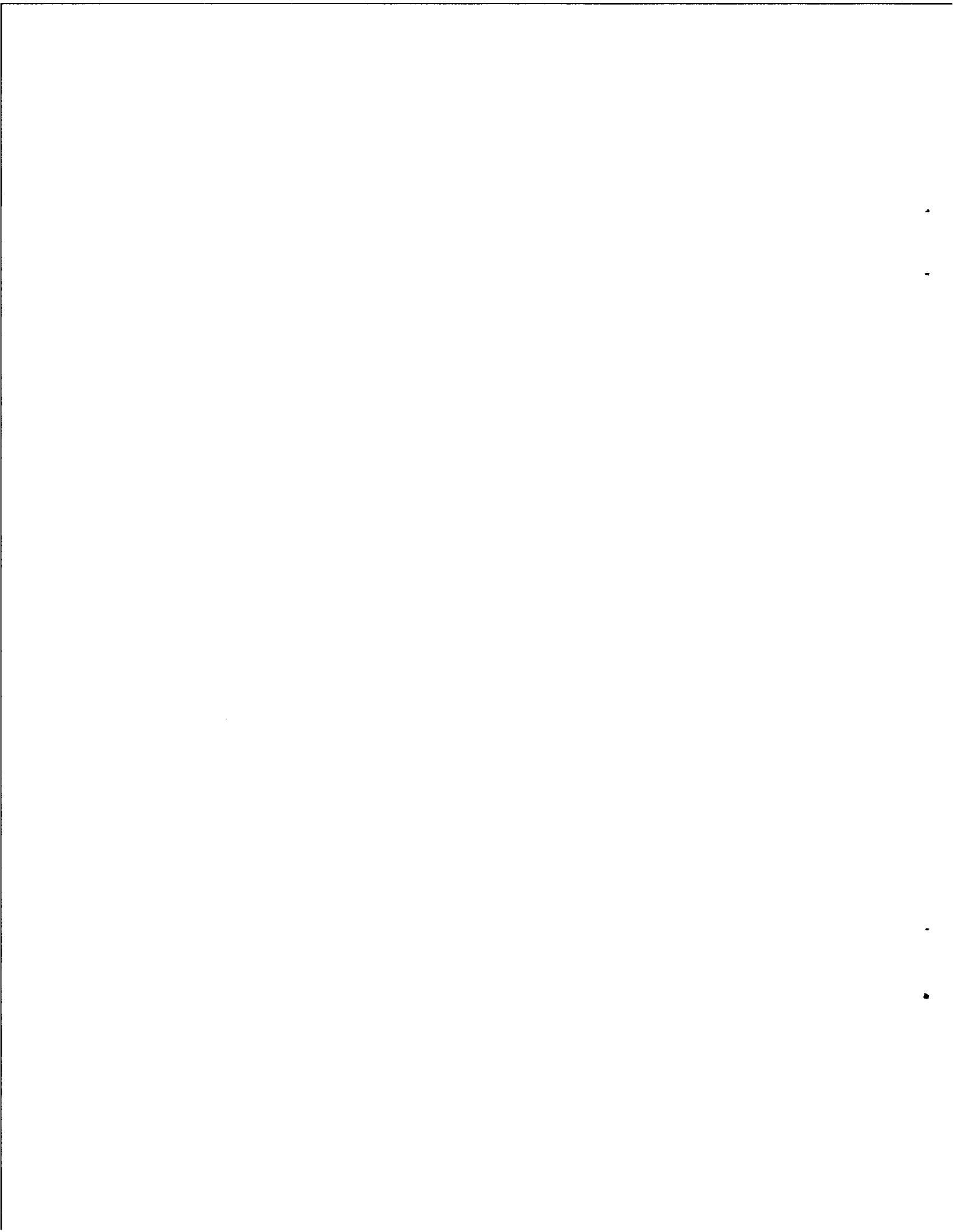
A full commuter ferry operation is not recommended at this time. For a commuter to switch from private automobile or existing public transportation, a water commuter service must offer travelers a degree of safety, reliability, comfort and economy that is above those of other modes. Given the limitations of the route, a commuter ferry on the Charles River is able to offer assurance on only two of the five of the above amenities. There are several reasons why a commuter ferry is feasible, but not recommended at this time. We recommend that the proponents investigate the interest of private ferry operators in the area to establish a water taxi service on the Charles River and pursue this avenue as the means to get to a commuter service in the future. However, some of the thoughts on how to proceed toward taxi service could also apply if the proponents desire to proceed with commuter service.

#### **7.1 TIME CONSTRAINT**

The first reason is that there are serious time constraints to traveling on the Charles River. Driving time to Boston rarely exceeds 35 minutes, more often it is 20 minutes even under congested conditions. Working on the assumption that the commuter boat would be traveling at the posted speed limit or lower, the travel time on the the Charles River by commuter ferry would range from 35 to 55 minutes on a non stop route.

#### **7.2 TRAFFIC CONGESTION**

Just as there is traffic congestion on land, there is traffic congestion on the Charles River. College rowing teams and private rower's practice schedules coincide with the morning and afternoon commuter rush hours. This factor alone means that the commuter ferry might not even reach the relatively low maximum river speed for motorized vessels and regardless of speed offers a potential safety hazard. It is recommended that pursuit of a commuter service should include the establishment of an operating schedule and a separate corridor during that schedule to avoid the potential of collision.



### 7.3 **PARKING**

Parking is a serious constraint, available in limited quantity at two proposed departure sites. These sites discussed, however, may be potentially closed to commuter activities. At all other stops along either side of the river, there is little or no parking available. It is recommended that the proponents of commuter service meet with the MDC on this issue.

### 7.4 **INTERMODAL CONNECTIONS**

Intermodal links at any of the proposed docking/terminal sites are non-existent. Most stops require a walk to the nearest public transportation stop to allow commuters to gain access to their final destination.

As example: If a commuter were to depart the boat on the Cambridge side near the Lars Anderson Bridge the nearest connection to public transportation is the red line branch of the MBTA rail division in Harvard Square. At M.I.T, there is a connection with the red line in Kendall Square two blocks inland. On the Boston side of the river the connection is the green line which runs parallel to the river on Commonwealth Avenue, also about two blocks away from the river. The green line can also be accessed a short distance from the Science Museum and the Cambridge Galleria.

Although buses traverse the Charles River at several points there are no forms of public transportation that operate along either side of the Charles. It is recommended that the proponents of ferry service meet with the MBTA to discuss the potential of shuttle service from the Boston and/or Cambridge sides of the river.

### 7.5 **WEATHER**

Weather is another constraint upon the reliability of service that would be required of any potential commuter ferry. It affects both the reliability and the duration of the service. The Charles River is normally frozen between 15 to 90 days a year. A scheduled ferry service could not operate during the winter months. Ferry commuters would have to find an alternate means for the winter season or go back to private vehicles. This break in schedule also places an unusual financial burden on the operator and would require the ferry service to, in effect, rebuild its ridership base each spring. It is recommended that the proponents consider a seasonal service based upon this.

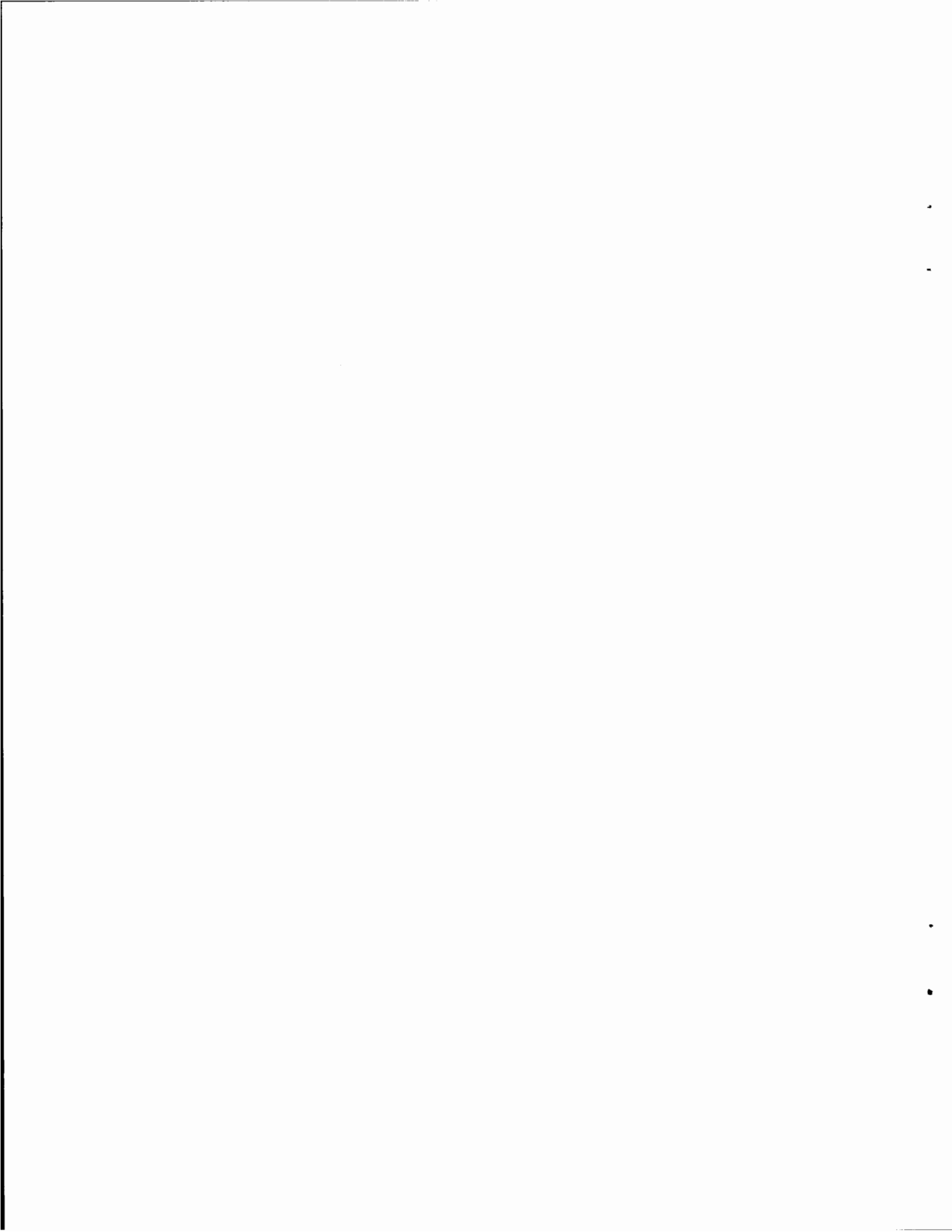
### 7.6 **FARE STRUCTURE**

Another potential obstacle for a service of this type would be the fare structure. As of now commuters can take public transportation into Boston at a cost range of \$1.85 to \$3.13 each way. It is unlikely that commuters would pay a premium. Unless a ferry operator was able to match this fare, the responses to our interviews indicated limited support for water based public transportation. It is recommended that the proponents deal with the State and cities to establish the mechanism for a subsidy, or find a private organization that will enter into the service with the understanding that it might take a number of years for the commuter portion of any operation to become profitable

### 7.7 **THE WATER TAXI ALTERNATIVE**

Although, based upon our analysis, we have concluded that a commuter ferry is not recommended unless certain constraints are eliminated, another form of water transportation, a **water taxi service**, may be feasible on the Charles River and lead the way to an eventual commuter service.

Water taxis operate differently from commuter ferries. A taxi would be primarily a

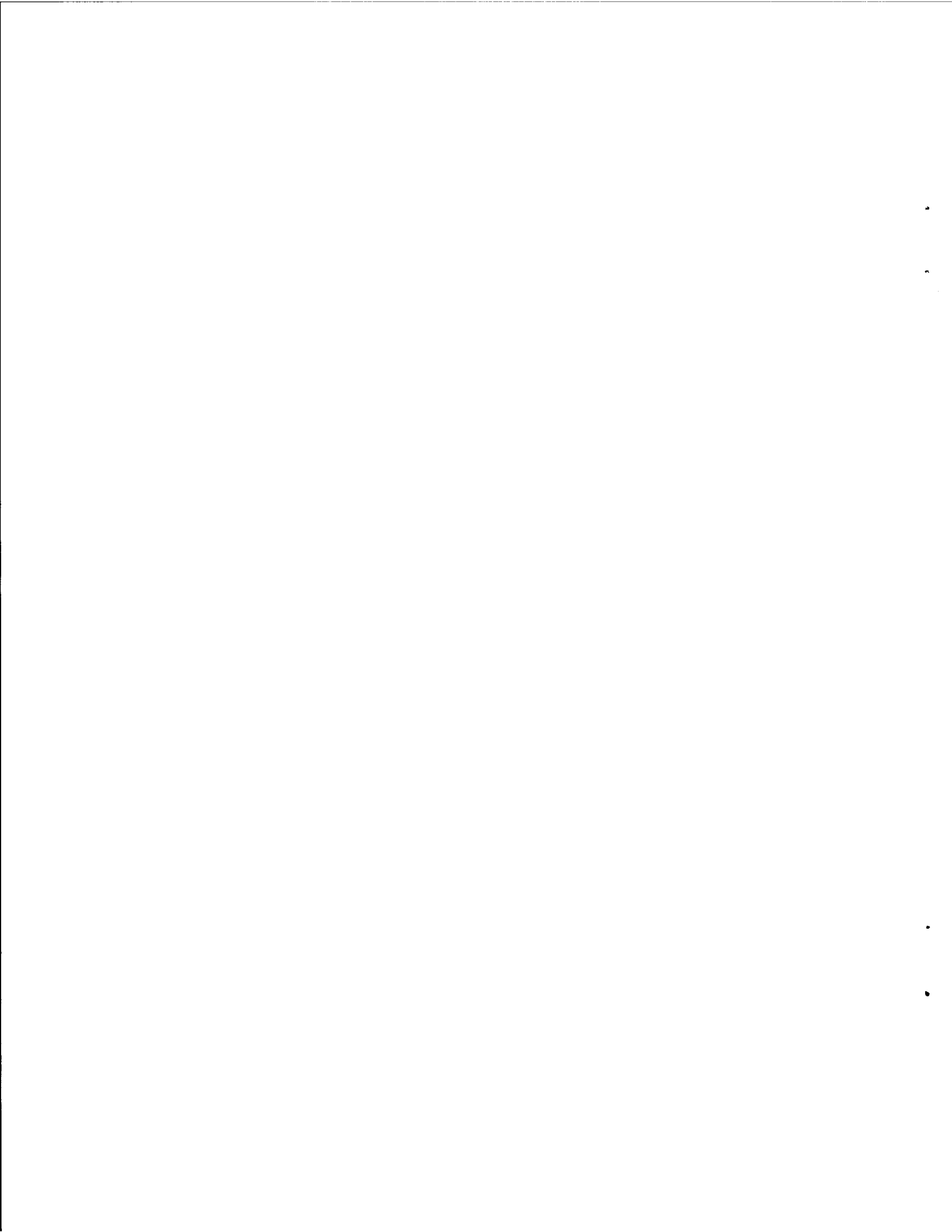




tourist oriented transport vehicle offering on demand service or regular routes in the Charles River Basin and could, if demand justified, reach out to the Newton, Watertown, Waltham areas on a regularly scheduled or on demand basis.

Substantiating the potential appeal of this service is the fact that a group of citizens from Newton took a test run from the Newton Yacht Club to the Cambridgeside Galleria and it was a great success. In addition, five hotels in close proximity to the Charles River appeared very enthusiastic about the service and the opportunity to offer this service to their guests. A water taxi could also be helpful to people who work along the river in Boston going to Cambridge or vice versa. Any restrictions on the service imposed by weather would be far less critical for a water taxi service since the tourist season is largely in the warmer months of the year.

A water taxi could utilize the same stops as those previously discussed for the commuter ferry, thus allowing users access to many parts of the Boston areas, and the opportunity to take water transportation for pleasure as well as business. The difference between the two water transport services is in the requirement for commitment.



**APPENDIX I**

**PERSONS CONTACTED DURING THE COURSE OF THE STUDY**



**APPENDIX I-            A LIST OF PERSONS CONTACTED DURING THE  
COURSE OF THIS STUDY**

Ms. Gretchen Ashton  
Massachusetts General Hospital  
Commuter Planning  
Ruth Sleeper Hall  
Parkman Street  
Boston, MA 02114

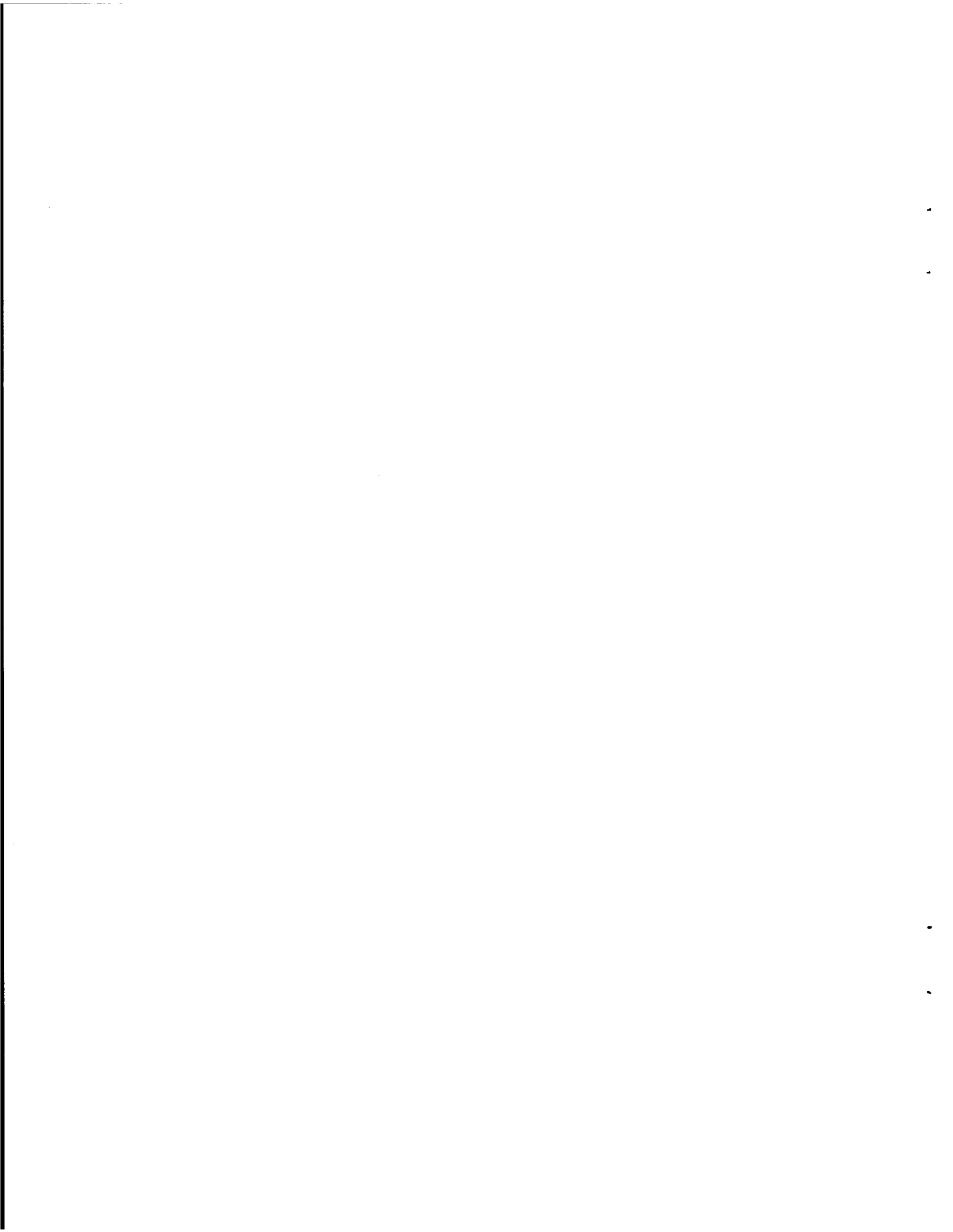
Mr. Don Birmingham  
Army Corp. of Engineers  
Regulatory Division  
424 Trapelo Road  
Waltham, MA 02154

Ms. Charnan Bray  
Economic Planner  
City of Newton  
Planning and Development  
1000 Commonwealth Avenue  
Newton, MA 02159

Mr. Russell Cushman  
General Manager  
Charles River Boat Company  
100 Cambridge Side Place  
Cambridge, MA 02141

Mr. Dan Driscoll  
Metropolitan District Commission  
Planning  
20 Somerset Street  
Boston, MA 02108

Mr. David Fargen  
Central Transportation Planning Staff  
10 Park Plaza  
Suite 250  
Boston, MA 02116



Mr. Tom Fawcett  
Boston University  
775 Commonwealth Avenue  
Boston, MA 02215

Dr. Bernie Gardner  
University of Massachusetts

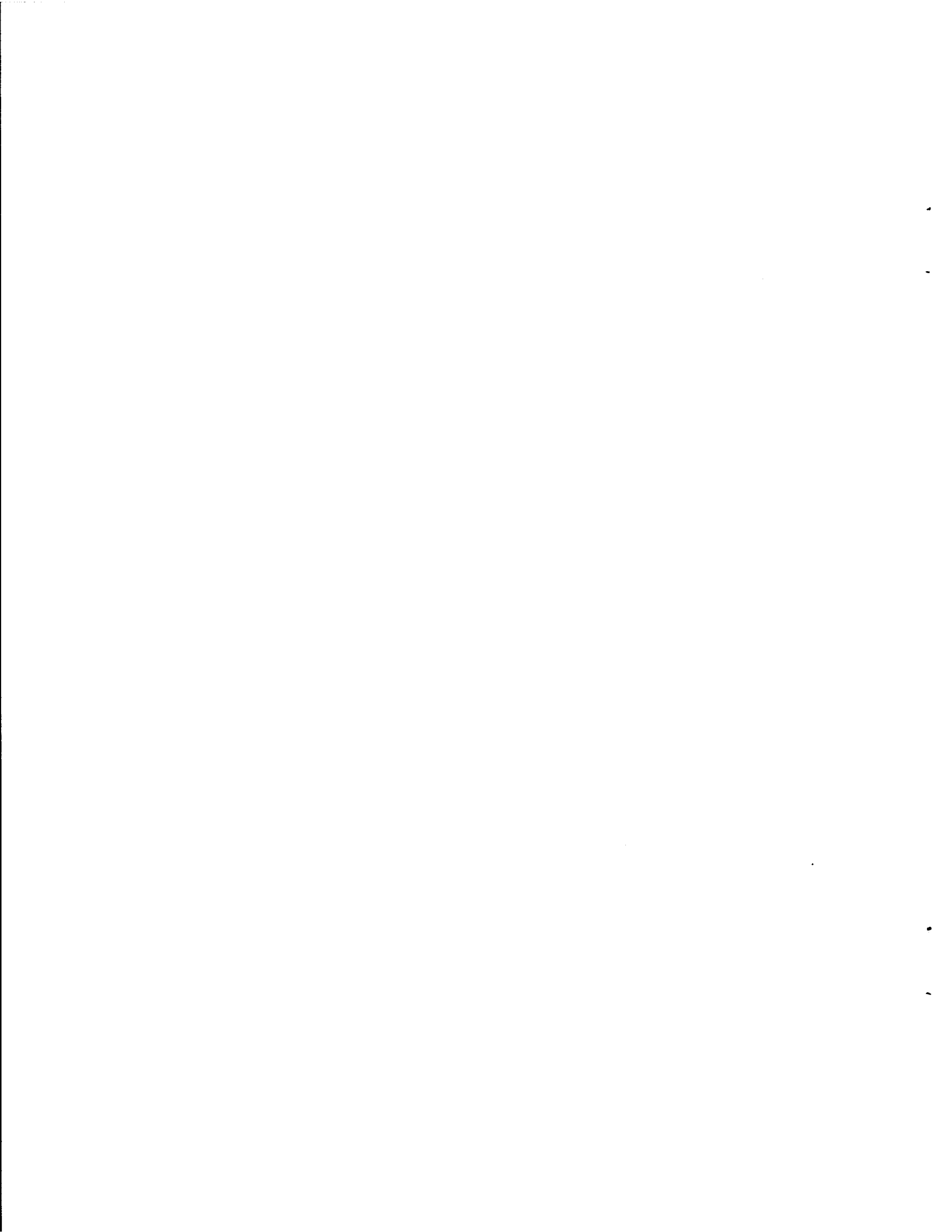
Mr. Robert Gerst  
Alderman  
City of Newton  
1000 Commonwealth Avenue  
Newton, MA 02159

Mr. Michael Levie  
General Manager  
Royal Sonesta Hotel  
5 Cambridge Parkway  
Cambridge, MA 02142

Dr. Jack Looney  
University of Massachusetts  
100 Morrissey Boulevard  
Boston, MA 02125-3393

Mrs. Teresa O'Halloran  
Riverrun Transportation  
1148 Centre Street  
Newton, MA 02159

Mr. Robert Simha  
Planning Director  
Massachusetts Institute of Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139

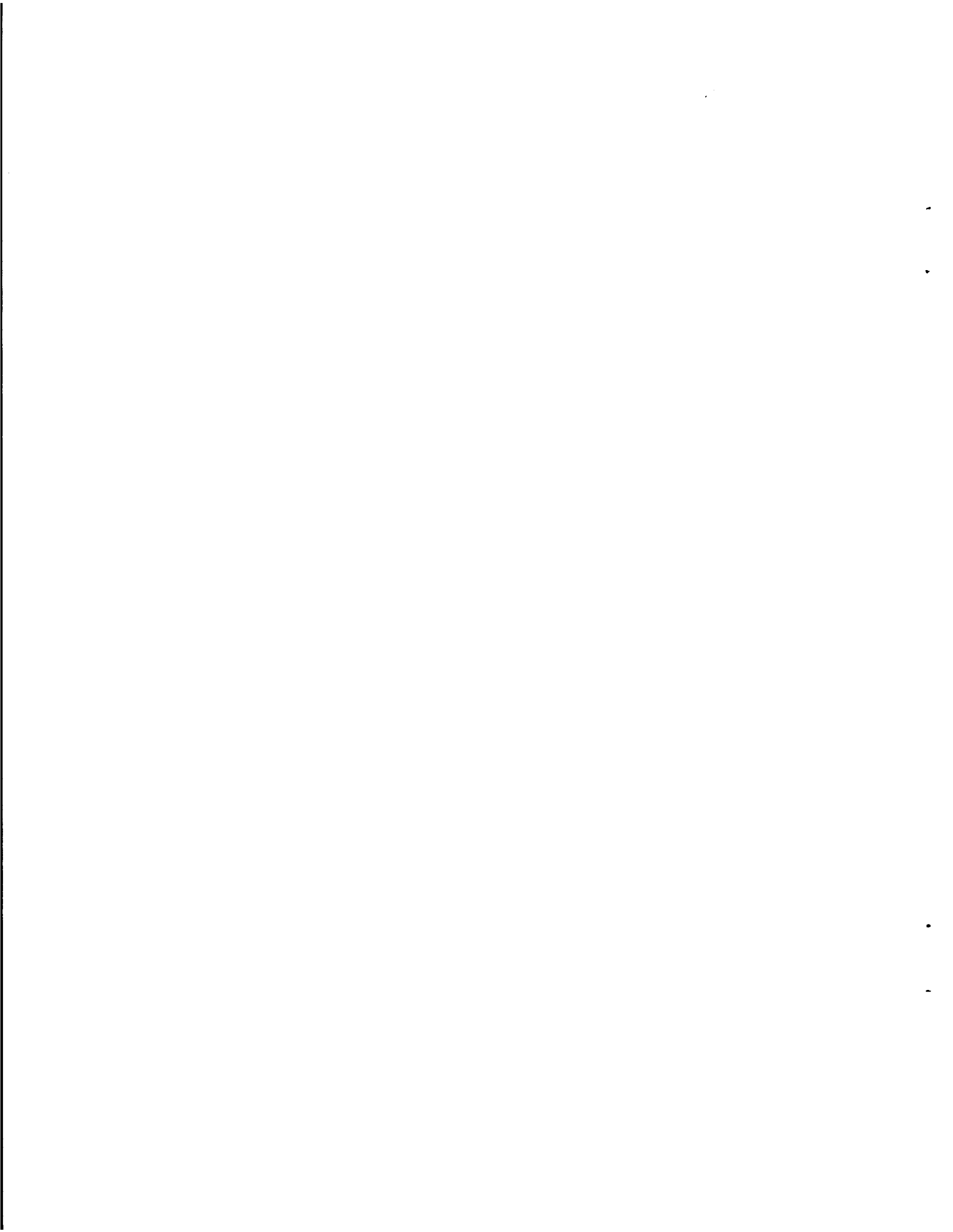




Ms. Donna Smallwood  
Caravans For Commuters, Inc.  
10 Park Plaza  
Suite 2180  
Boston, MA 02116

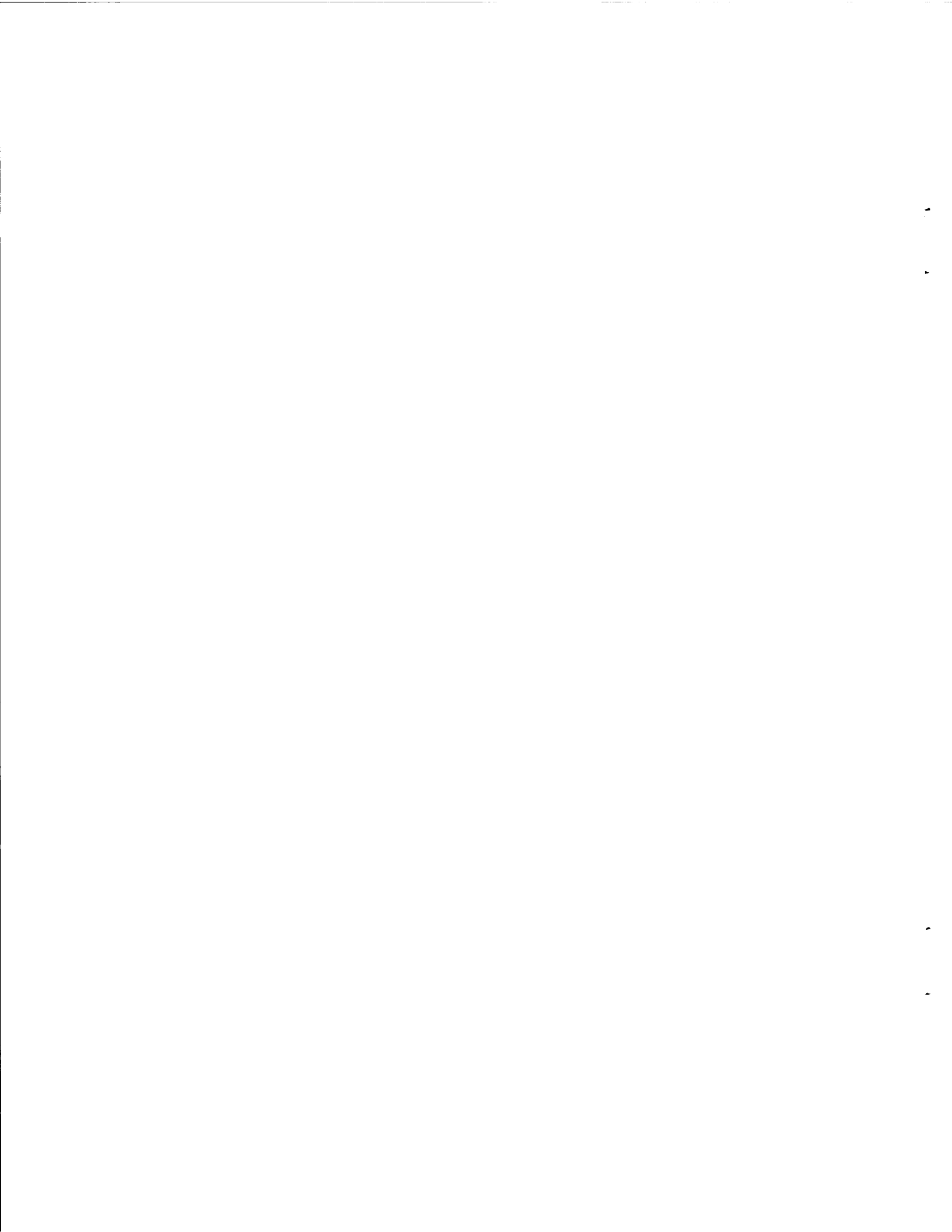
Nick Winters  
Director of the Locks  
Metropolitan District Commission  
200 Beverly Street  
Boston, MA 02114-2141

Mr. Mitch Ziencince  
Environmental Protection Agency  
Wetlands and Waterways  
Region 1 J.F.K. Building (ATA)  
Boston, MA 02203



**APPENDIX II**

**COMMENTS AND INFORMATION FROM RECREATIONAL USERS OF THE  
CHARLES RIVER**



**APPENDIX II -**

**Comments and Information from Recreational Users of the Charles River**

Recreational boating groups were contacted during the course of this study and a telephone survey was taken on their activities and their opinion of the impact of a commercial water transportation operation on their activities. The following comments were received as a result of our conversations:

Harvard Sailing Club  
Michael O'Connor - Assistant Manager  
130 Memorial Drive, Cambridge, MA  
(617) 495-3434

Harvard Sailing Club has 18 Inter Club Dingys, 18 Lark Dingys, six Lazars, 3 Boston Whalers, and one Europe Dingy. They practice Tuesday through Friday from 2:00 to 6:00 P.M. On weekends they are on the river from 9:00 A.M. to 6:00 P.M.. They use the whole river. Mr. O'Connor said the commuter boat would be a significant imposition on the sailing community.

\* \* \*

M.I.T. Sailing  
Fran Charles, Hatch Brown Sailing Master  
Memorial Drive,  
3 Ames Street, Cambridge, MA 02125  
(617) 253-4884

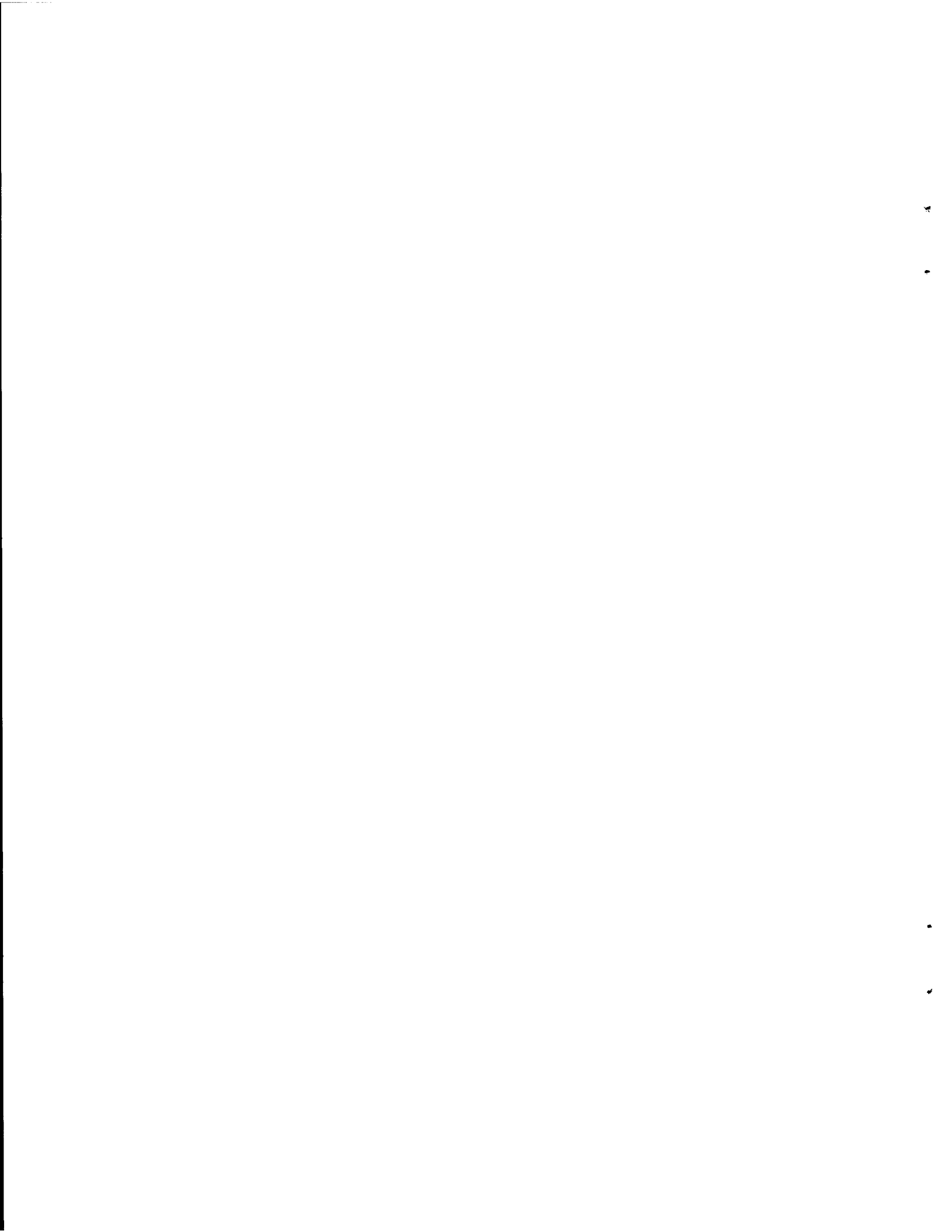
This club has 87 boats. These boats are mostly in use from April 1st to November 15th. On average there is about 40 boats out at a time. They use the basin area. They have their races on Monday through Thursday evenings in the summer. On Saturday and Sundays they race all day. Mr. Brown doesn't feel the commuter boat would have a big impact on them in general.

\* \* \*

Community Sailing -  
Mary Coch Assistant Director  
21 Embankment Road,  
Boston, MA 02115  
(617)523-7406 or (617) 523-1038

This club is open from April 1st, to November 1st. They have 160 boats located mostly between the Mass Ave. bridge and the Longfellow Bridge. Also know as the Charles River basin area. They use the whole river in this area. The boats from this club are out from 9:00 A.M. until 8:30 P.M., or sunset. Mary Coch is not in favor of the commuter boat because their busiest time is 4:00 to 6:00 P.M. She believes it poses a problem for traffic impact and a safety problem.

\* \* \*



Union Boat Club  
Sam Trusow  
Embankment Road  
Boston, MA 02114  
(617) 523-9718

This club has 60 rowing shells. The schedule is heavier from February to December. During these months from 6:00 to 10:00 A.M. there is approximately 20 boats out. From 3:00 to 7:30, there are 10 to 15 boats out. During the middle part of the day there are approximately 4 boats out. In the months of February and March there is only half the number of boats out on the river.

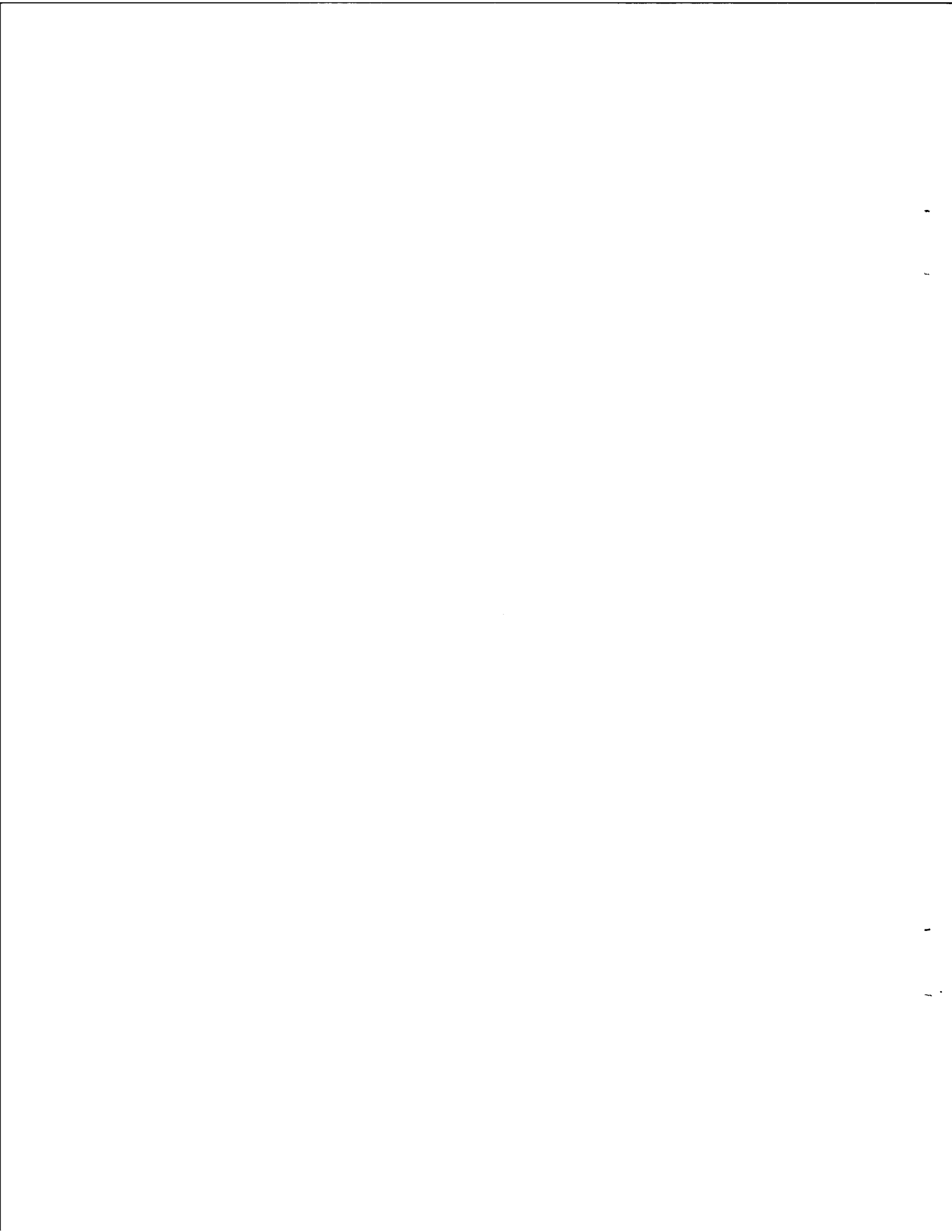
\* \* \*

M.I.T. Rowing (Pierce Boat House)  
(617) 253-9676  
Dick Parelli, Stew Schmill Director of Crew

This club has boats on the Charles River during the months of September, October, November, December, March, April and May. Monday through Friday they have approximately 8 boats with 8 people in them on the river from 6:30 to 8:30 A.M. then again from 4:00 to 7:00 P.M..

**Note:** During the afternoon there are more people on the river from this club. The rowers from M.I.T. increase from 50 people to about 100 people. This would increase the number of boats by at least eight. On Saturdays they have about 150 people out on the river between 7:00 and 10:00 A.M.. M.I.T. use the whole river. This is not what the other clubs say they do, supposedly when your going down river you go on the right side and when going up river you go on the left side. They row in the upper and lower basin. Mr. Schmill would not be opposed to the commuter boat unless the boat caused a wake. However, he does not think it would be feasible because of the time it would take to get to Boston.

\* \* \*





Boston University. Rowing -  
Rodney Pratt, Rowing Captain  
300 Babcock Street  
Boston, MA 02215  
(617) 492-6335

This school practices from 6:30 to 8:00 A.M. then again from 4:00 to 8:30 P.M.. They have around 16 boats on the river at these times. They go from the B.U. bridge to the Mass Ave. bridge. They are usually on the Cambridge side of the river. The races occur on the weekends during the Fall and Spring. Boston University attempts to block off the river during these times if they can, to prevent any wake during the race. This is not always possible, however, to block off the river. Mr. Pratt is not necessarily against the commuter boat however, he feels the river is already too crowded. He feels if there is a schedule to the commuter boat then "I guess people can know when to expect the boat".

NOTE: He also said there is a public landing 500 meters down from the B.U. sailing pavilion.

\* \* \*

Boston University Sailing -  
Frank Glavin  
300 Babcock Street  
Boston, MA 02215  
(617) 353-9307

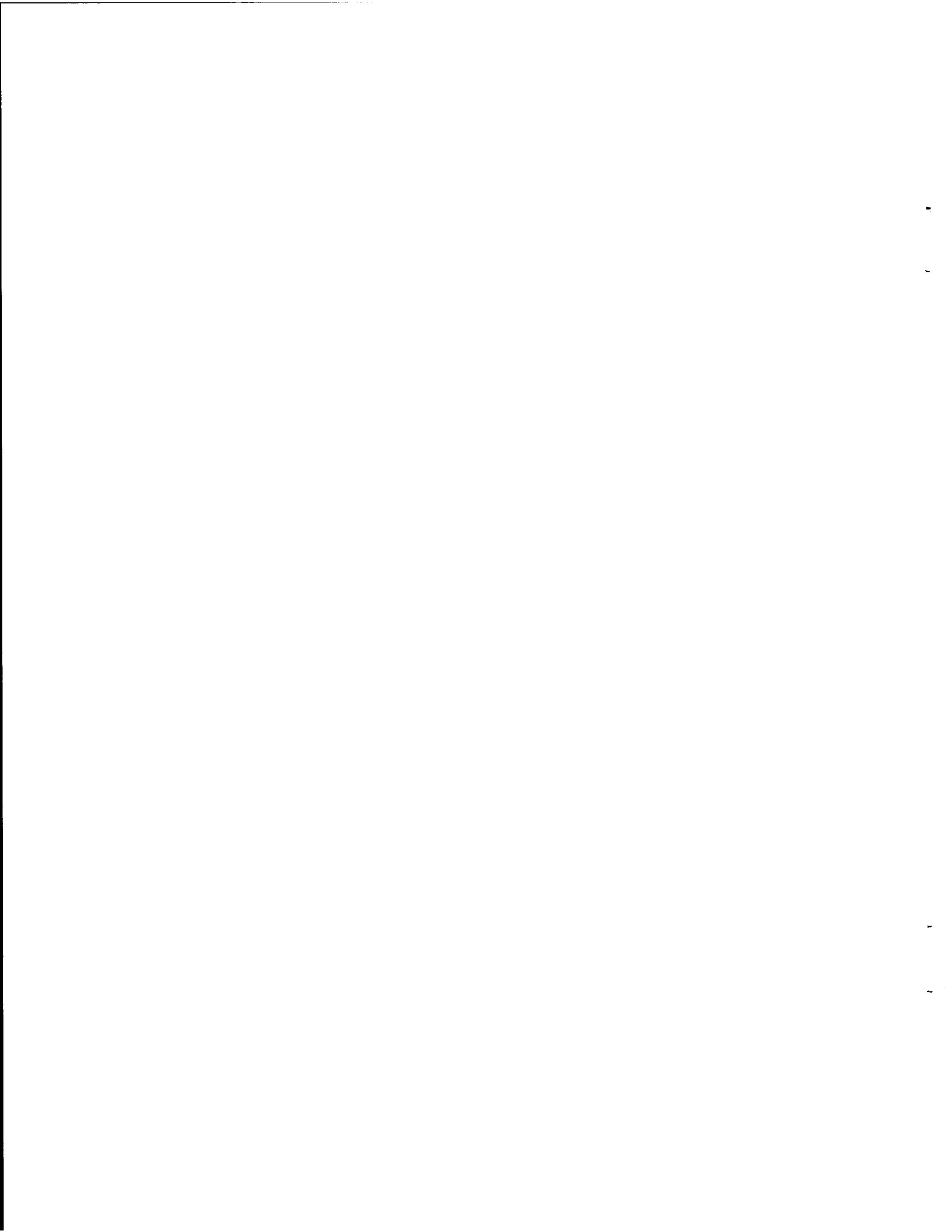
This club has 12 Flying Jacks (FJ's) and 6 Techs. Same design racing. They have practice usually an average of 3 times a week, during the hours of 2:00 to 6:00 P.M.. They practice in the area of the B.U. bridge to the Mass Ave. bridge.

\* \* \*

Riverside Boat Club  
(617) 492-1869

No comments were offered.

\* \* \*



Weld Boat House (Radcliff)  
 Dan Boyne, Director of Recreational Sculling program  
 Liz O'Leary, Women's Coach  
 60 J.F.K. Street, Memorial Drive  
 Cambridge, MA 02138  
 (617) 495-9249

This school has anywhere from 20 to 200 boats on the river at a time. In the fall season they practice from 6:00 to 8:00 A.M., then again from 4:00 to 8:00 P.M. During this time they have a minimum of 20 boats on the river. During the spring and summer season they practice during the same times but the number of boats increases to 270

According to Dan Boyne there are at times approximately 1,000 boats on the river at one time. He is not happy with the new kayak rental place on the river that just opened up. Dan Boyne does not think the commuter boat is a good idea because of the safety factor. He believes the river is too crowded as it is.

\* \* \*

Newell Boat House (Harvard Rowing) -  
 Harry Parker Captain of the Men's Program  
 (617) 495-7775

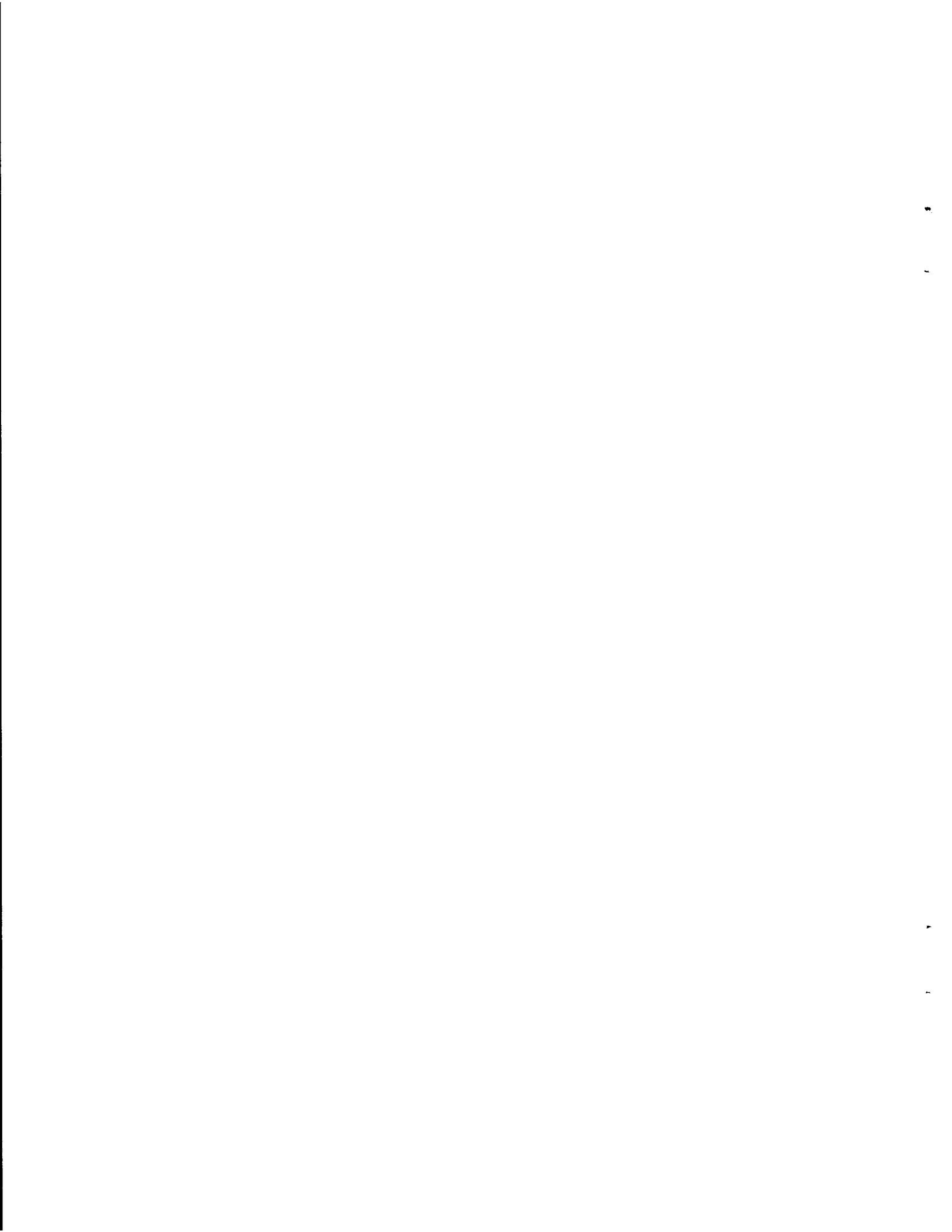
The schedule for this school is: from 6:00 to 9:00 A.M. there are eight two man shells. From 2:00 to 6:30 P.M. they have 20 eight man shells on the river, Monday through Saturday. Mr. Parker is very concerned about the commuter boat on the river for several reasons. The speed the boat would be travelling and the issue of wake and the issue of safety.

\* \* \*

Cambridge Boat Club  
 Geoffrey Knauth Men's Co-Captain  
 Gerry's Landing Road  
 Cambridge, MA 02138  
 (617) 354-9696

The schedule for the Cambridge boat club is : from 6:00 to 9:00 A.M. there is 12 boats that go out. From 5:00 until sundown there are 12 boats. Geoffrey is opposed to the commuter boat if the boat does not adhere to the no wake speed limit. He is very uneasy about the idea of a commuter boat on the river. Although he said the Charles River Boat Company is fine on the river because the boats do not cause a wake at all. The general consensus is that they all like this boat.

\* \* \*



Belmont Hill  
 350 Prospect Street  
 Belmont, MA 02178  
 (617) 484-4410  
 Ted McMahon

This school also shares the boat house with the Windsor School. The schedule extends from from Mid March to July. The school has boats on the river from 2:00 to 7:00 P.M. on Monday through Fridays. They have their races on Saturdays in the late mornings. They have 20 boats that are a mix of eights and fours. They use the whole river. Ted McMahons opinion is that there is already too many boats on the river.

\* \* \*

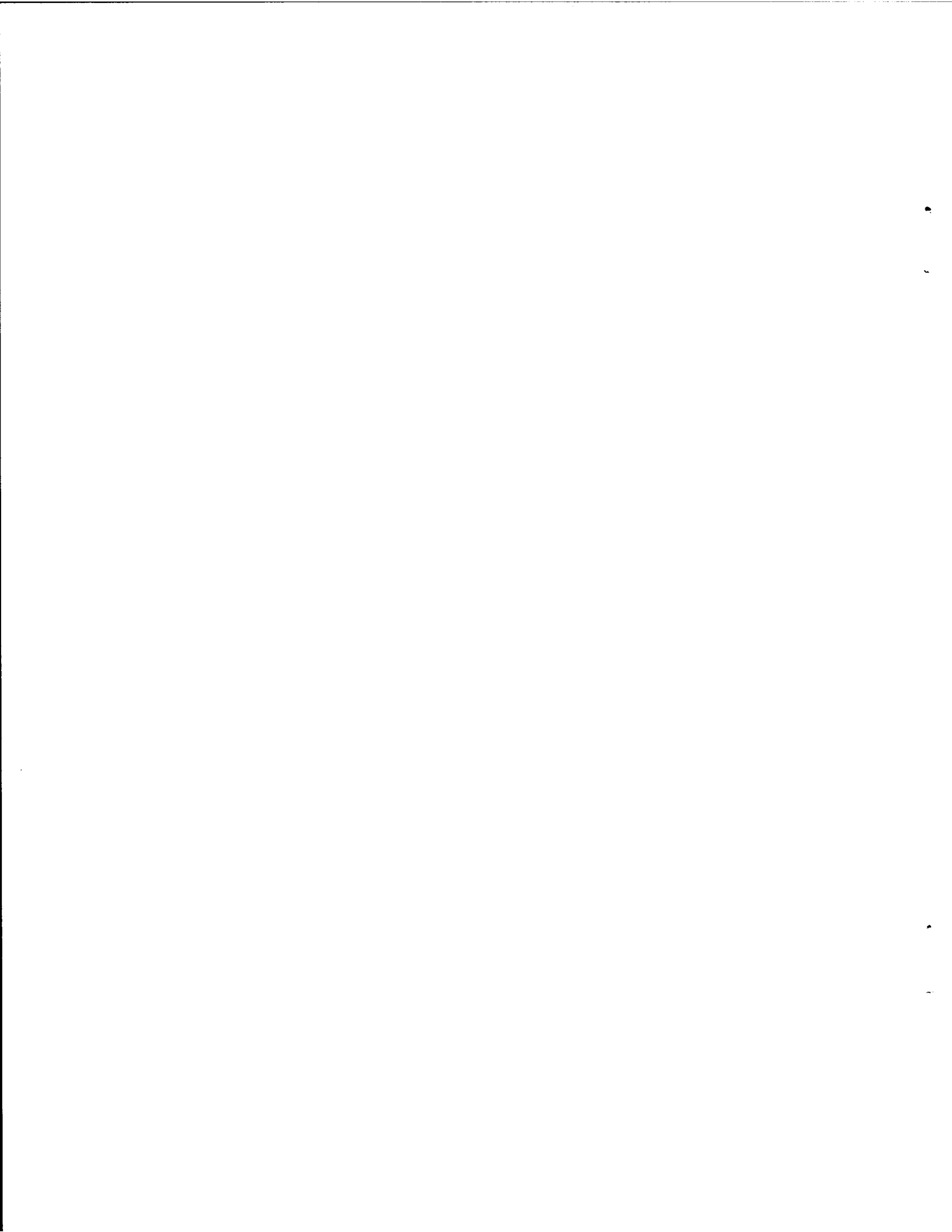
Buckingham, Brown & Nichols -  
 Gerry's Landing Road  
 Cambridge, MA 02138  
 (617) 864-866  
 Athletic Director Jack Etter

This is a high school grades seven through 12. The schedule for this school is: from 12:00 to 2:00 P.M. there are 24 four man boats, as well as one eight man training scull. Seventh and eighth graders are out at this time. From 3:00 to 7:00 P.M the ninth through 12th graders are on the river using the same number of boats. This school uses the river during these times Monday through Friday.

\* \* \*

Northeastern (Henderson Boat House),  
 360 Huntington Avenue  
 Boston, MA 02115  
 (617) 782-1933  
 Joe Wilhelm

Fall season starts around September 15th. There is an average of about 15 boats carrying 8 rowers, and around 4 pairs or singles. The schedule for practice is 6:00 to 8:00 A.M. , then again from 3:00 to 7:30 P.M.. They don't have any boats on the river from November to mid February. Then from mid February on, the practice times are the same but the number of boats differs. There are 10 boats with 8 rowers and 4 singles or pairs.



Note: Mr. Wilhelm indicated that during the busy times there is so much traffic on the river that eventhough the posted speed limit is 6 miles an hour, a commuter boat would be lucky if it could safely operate at 4 miles an hour.

\* \* \*

Community Rowing  
P.O. Box 2604  
Cambridge, MA 02238  
(617) 782-9091  
Kate Sullivan

This rowing club works out from the MDC skating rink on Nonantum Road. They are the only public access program around. Ms Sullivan displayed interest in the idea of having a ferry/commuter boat on the river. She would be especially interested if the ferry started at Daley Field, where Community Rowing is located.

Ms Sullivan believes that as a public access group Community Rowing could be of some help (not really clear on what kind of help) when the people involved are ready to actually move on the idea.

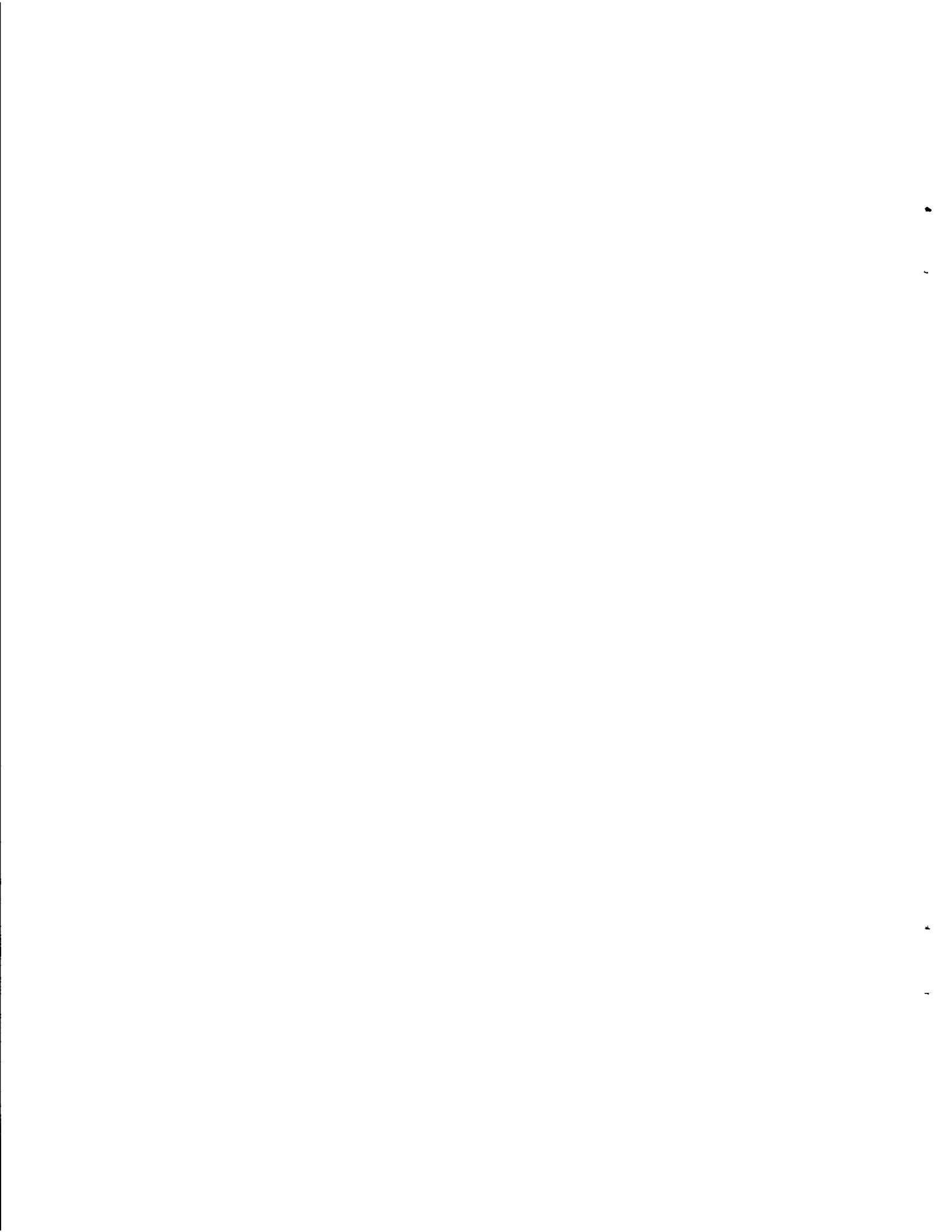
Communities Rowing schedule is: from 6:00 to 7:30 A.M. There are 17 boats with 8 rowers in them. From 3:30 to 5:30 they have their novice high school program. This involves approximately 12 boats with 8 rowers in them. Kate also mentioned that during the novice time people like to stay away from the area because these rowers are "inexperienced and all over the place". From 5:30 to 8:30 there is approximately 10 boats with 8 rowers in them. During the above mentioned times there are usually 12 singles and an occasional boat that holds 4 rowers.

\* \* \*

Boston College  
552-8000, 259-4425  
John Chiovacco

The experienced rowers from this college row on the upper Charles from the Moody Street Bridge in Waltham to the Marriott Hotel in Newton. Their novice rowers row in the Watertown area up to the Elliot Street Bridge. These rowers are on the river everyday from 3:00 to 6:00 P.M. from mid-September to October 31st.

Note: John mentioned there would most likely be very strong opposition from the colleges and the numerous boat clubs along the river.





There are 60 public moorings located at Poor Mans Landing and at 1st Street, both are located in Cambridge. These public moorings are allotted by the MDC based on a lottery system.

\* \* \*

### **Private Yacht Clubs**

Charles Gate Yacht Club  
20 Cambridge Parkway  
Cambridge, MA 02142  
(617) 354-8215  
No contact name

The Charles Gate Yacht club has 60 boats. Most of the boats from this club go into the harbor. This club is located just a short distance from the locks.

\* \* \*

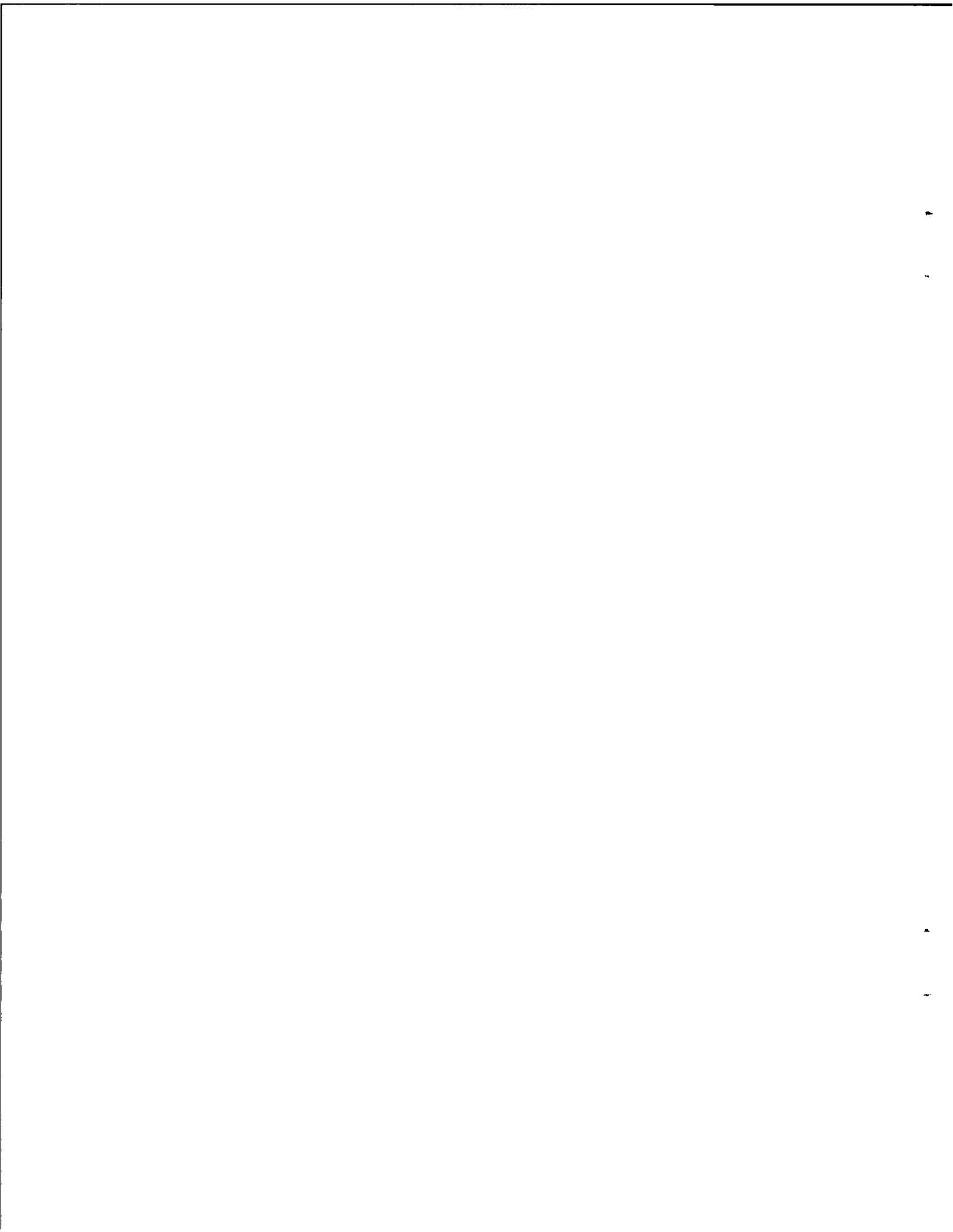
Watertown Yacht Club - 924-9848  
425 Charles River Road  
Watertown, MA 02172

The Watertown Yacht club has 110 slips. The boats go out often both during the week and on the weekends.

\* \* \*

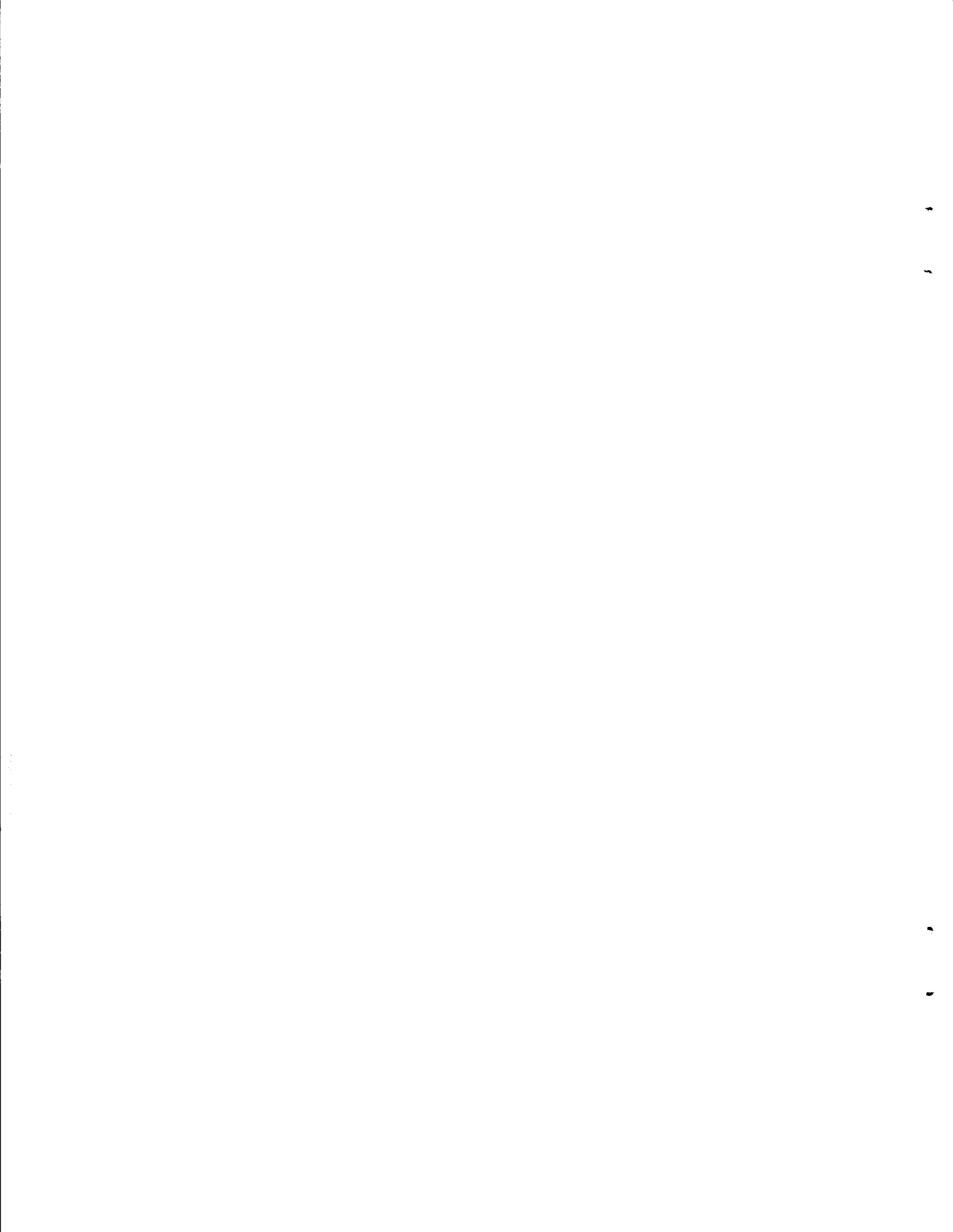
Newton Yacht Club  
Nonantum Road  
Watertown, MA 02172  
No contact name

The Newton Yacht Club has 104 boats at the club. On average about 10 boats go out on the weekend and even less during the week.



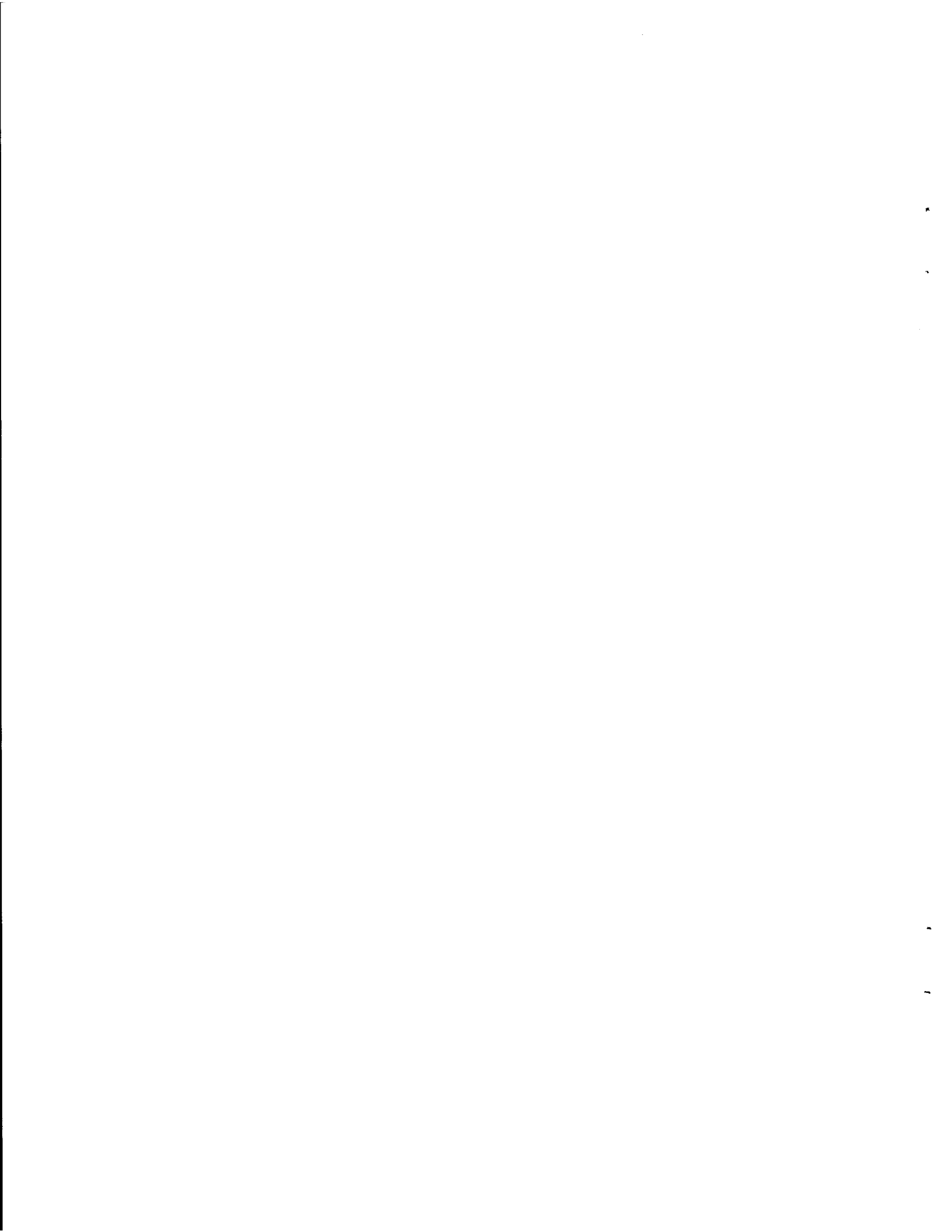
**APPENDIX III**

**COMPUTERIZED MAP OF THE CHARLES RIVER**

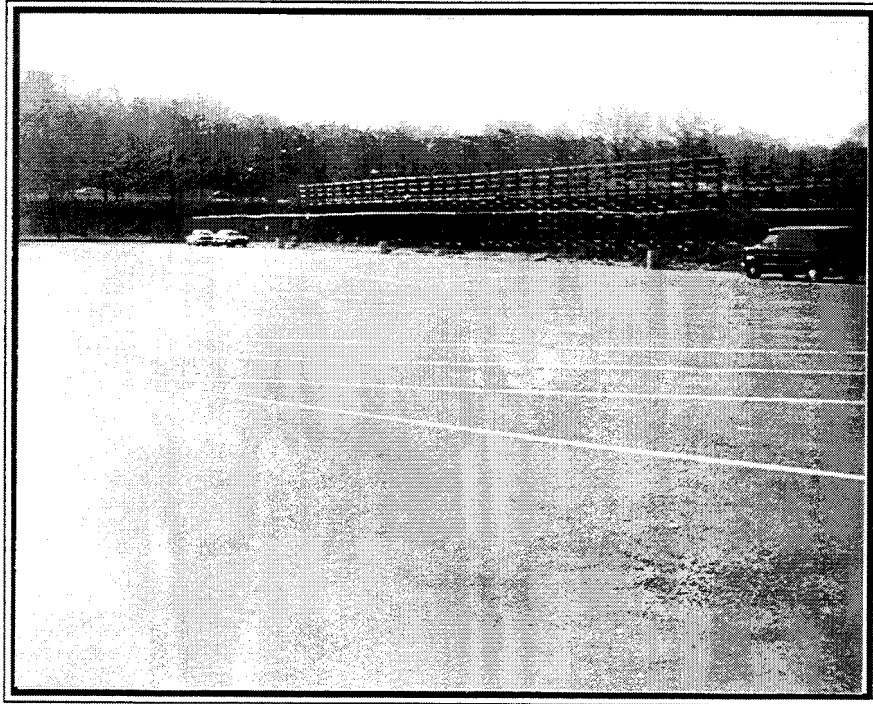


**APPENDIX IV**

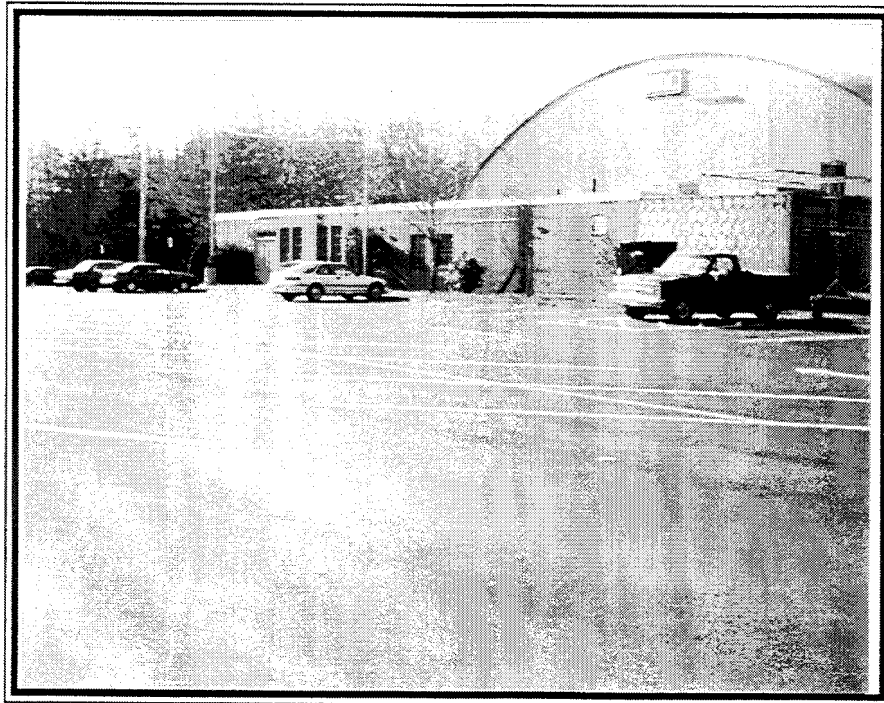
**PHOTOS OF SELECTED PARKING AND DOCKING FACILITIES ALONG THE  
CHARLES RIVER**



PARKING LOT AT M.D.C. LOT



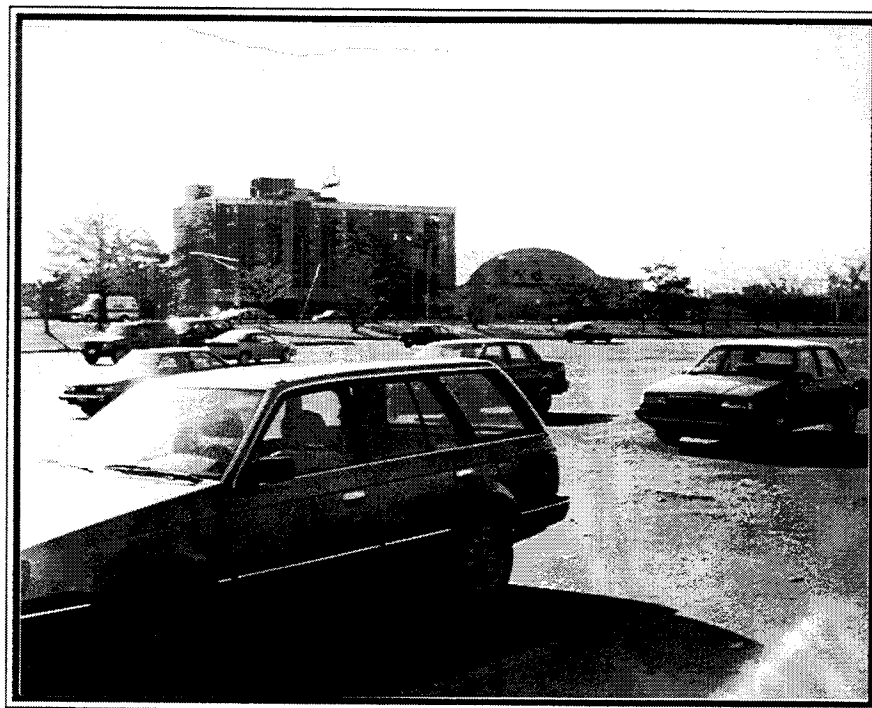
PARKING LOT AT M.D.C. SKATING RINK

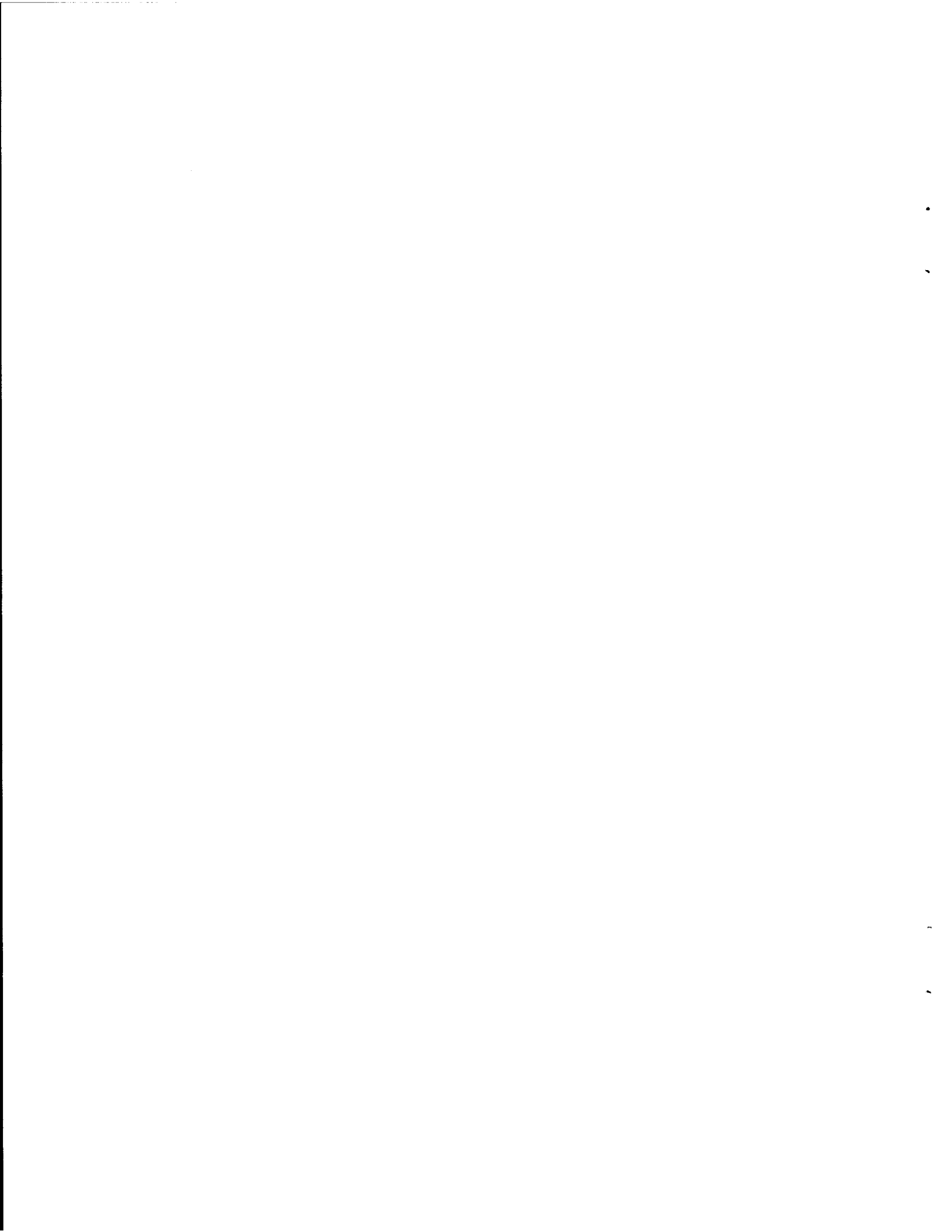






PARKING LOT AT CHRISTIAN HERTER FIELD





RAMP AT DALEY FIELD



DOCKS AT COMMUNITY ROWING



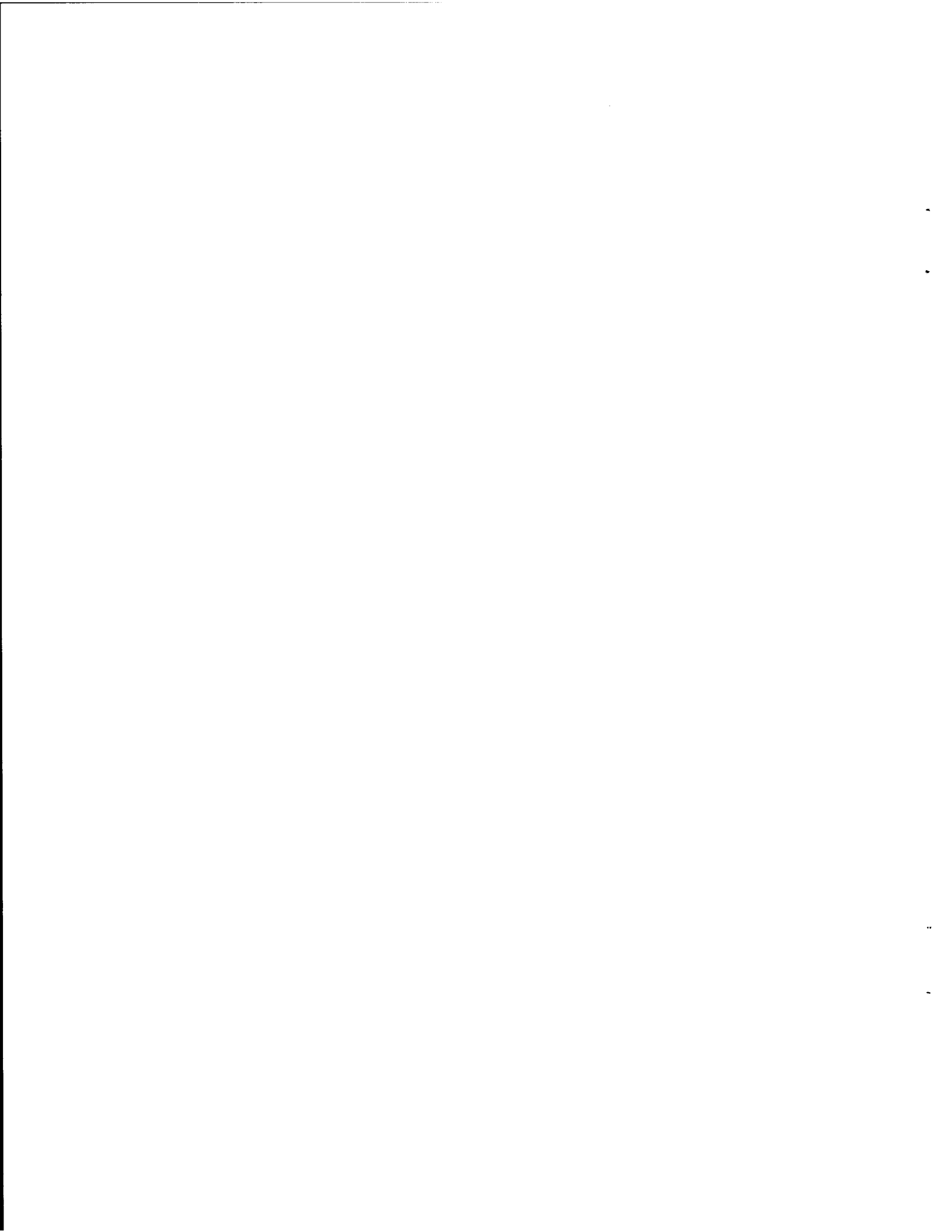


CHRISTIAN HERTER FIELD DOCK



LONGFELLOW BRIDGE

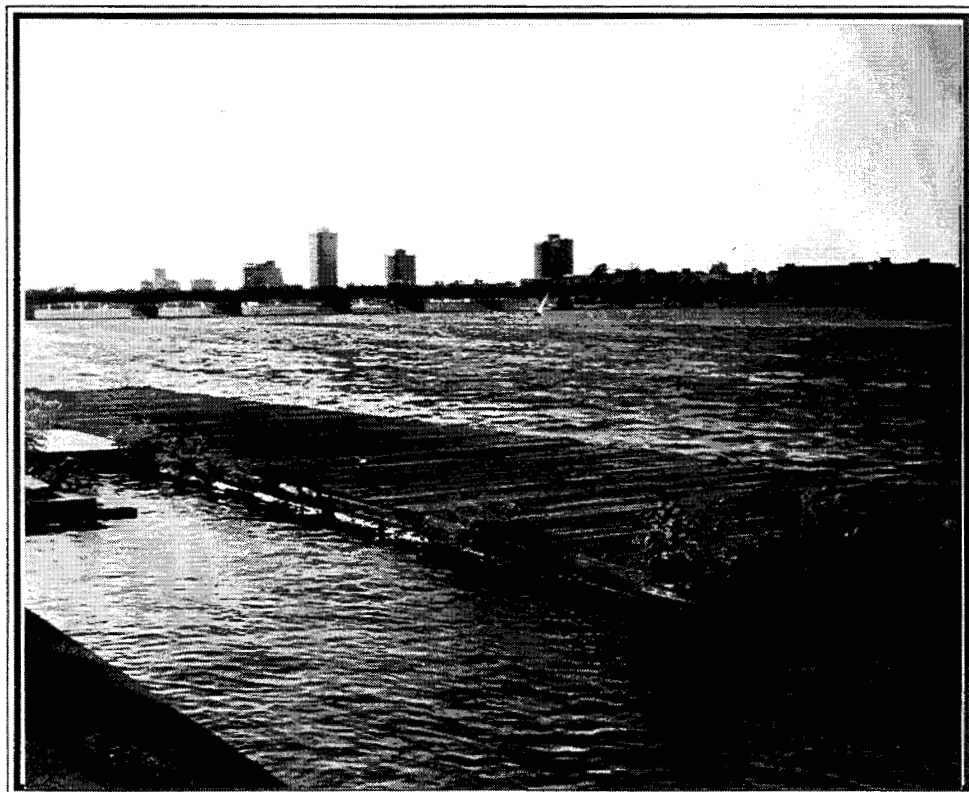


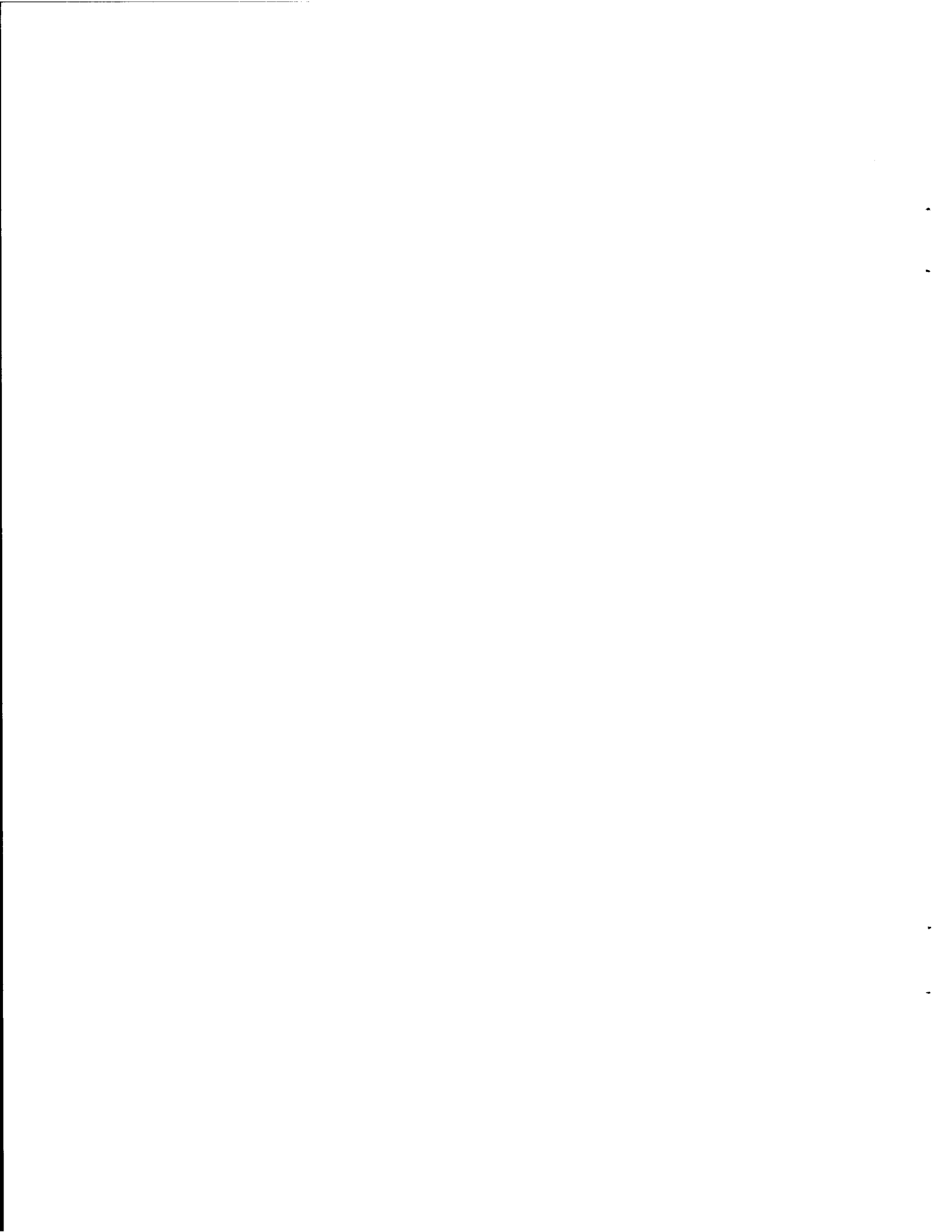


EMERSON DOCK



FAIRFIELD STREET DOCK





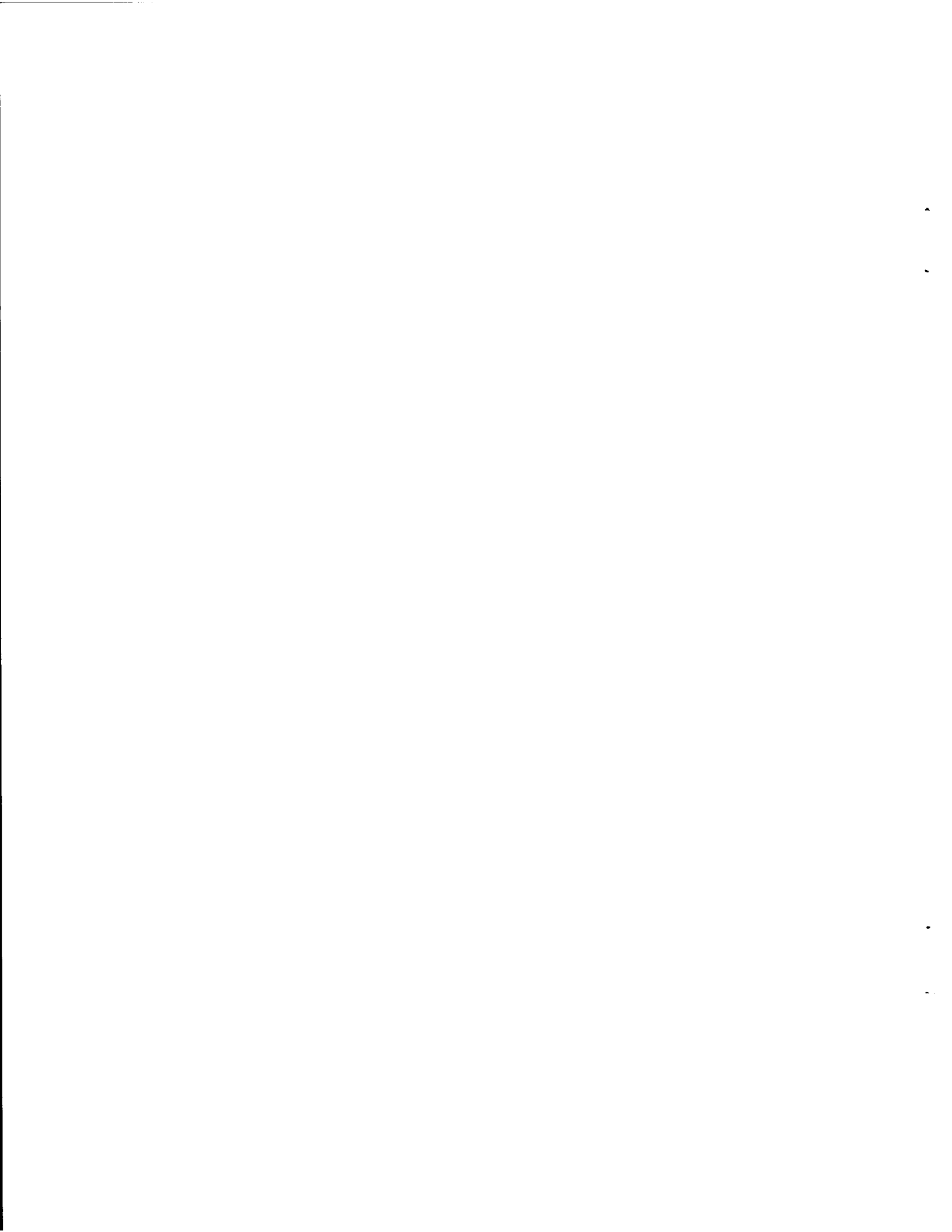


UNION BOAT HOUSE DOCK



ESPLANADE DOCK

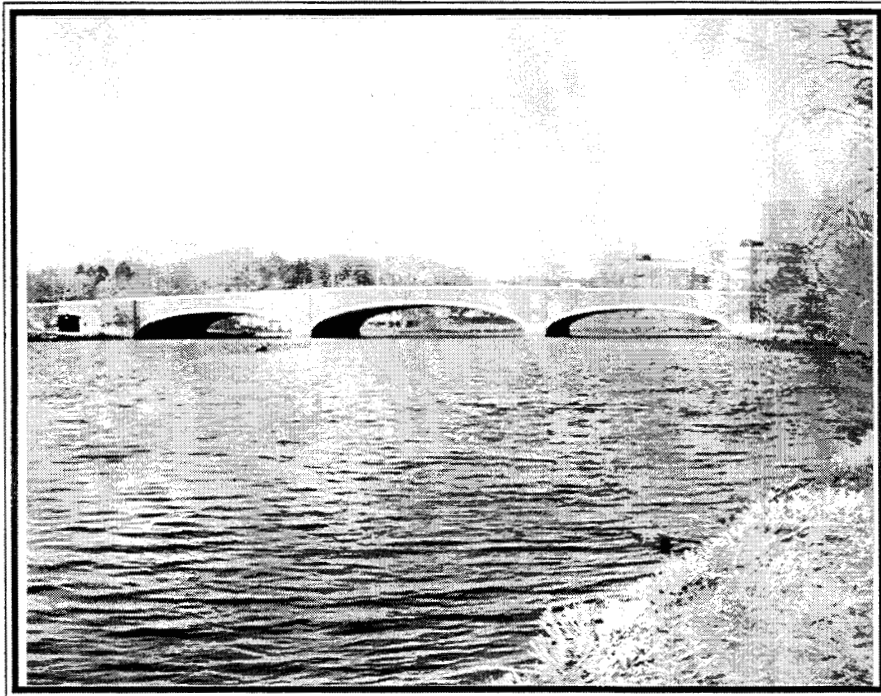


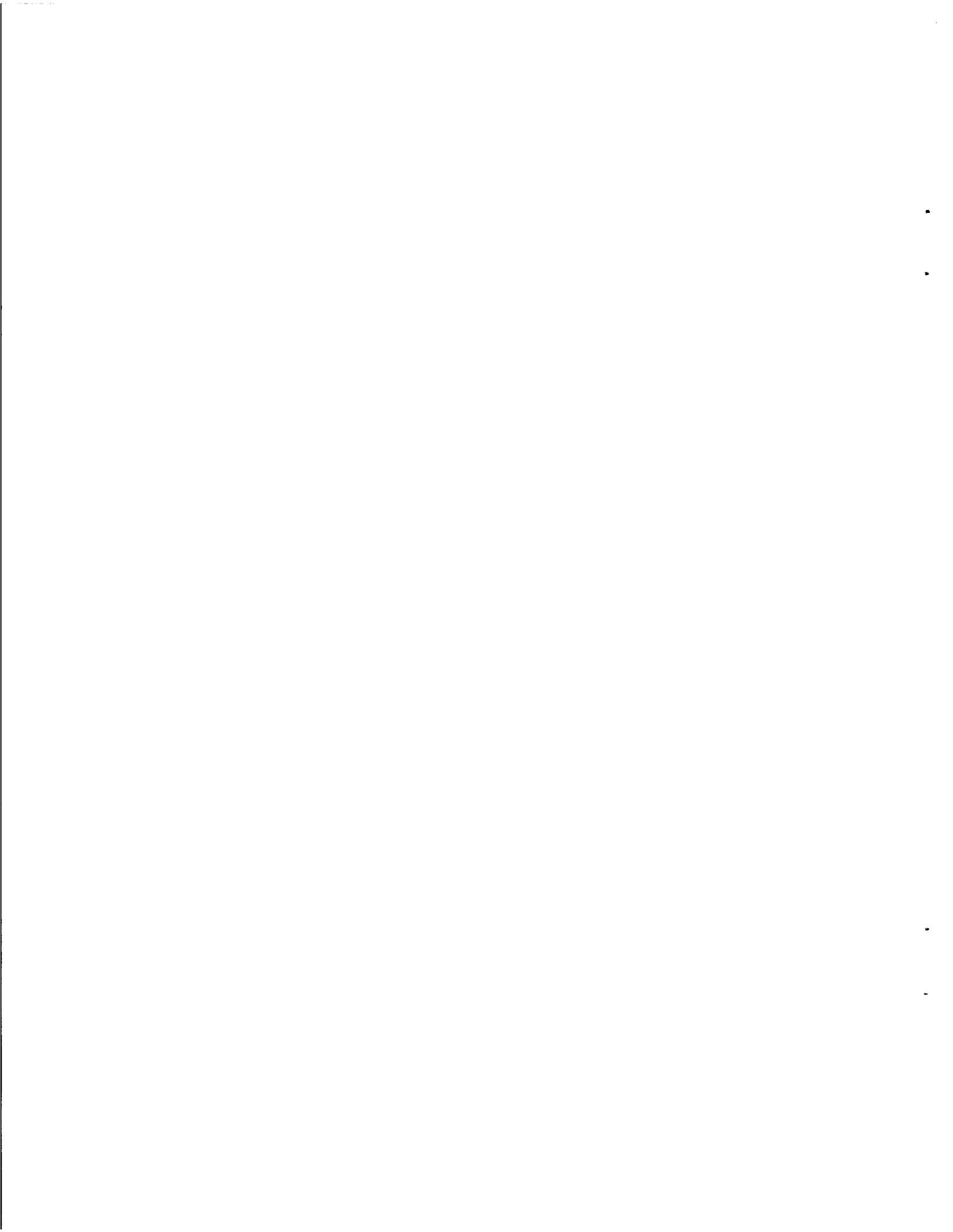


WEEKS FOOTBRIDGE

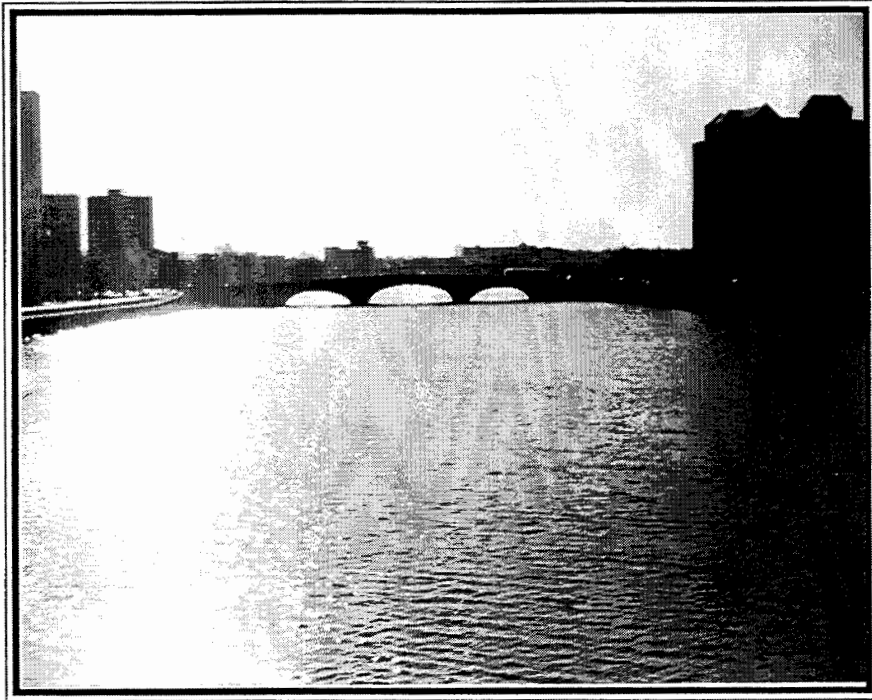


ELIOT BRIDGE

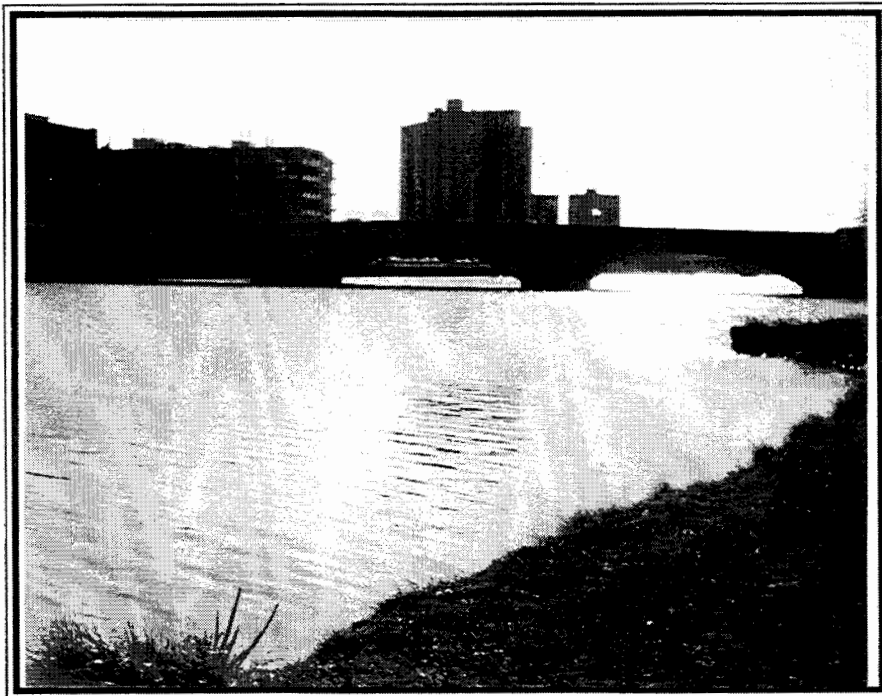


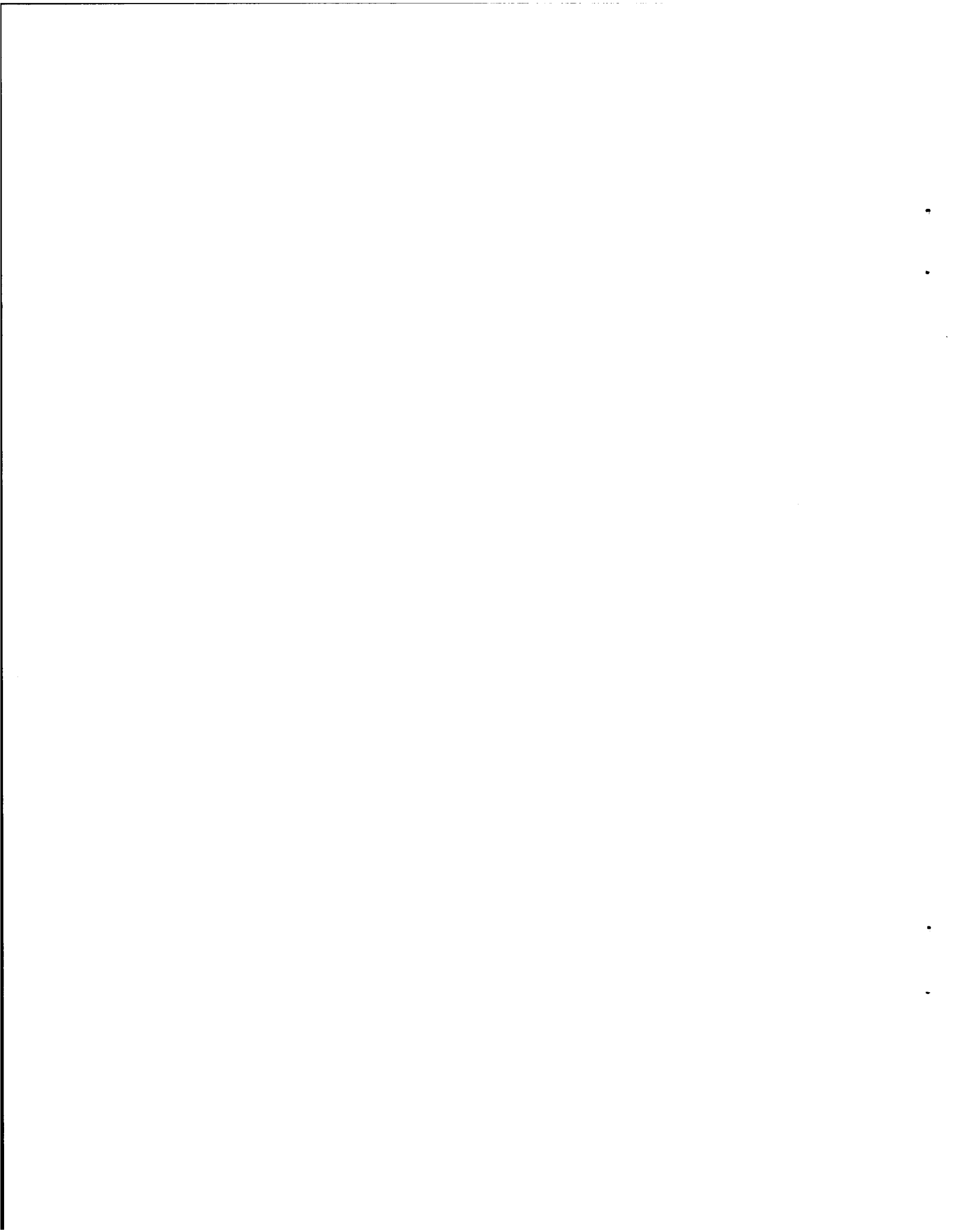


RIVER STREET BRIDGE



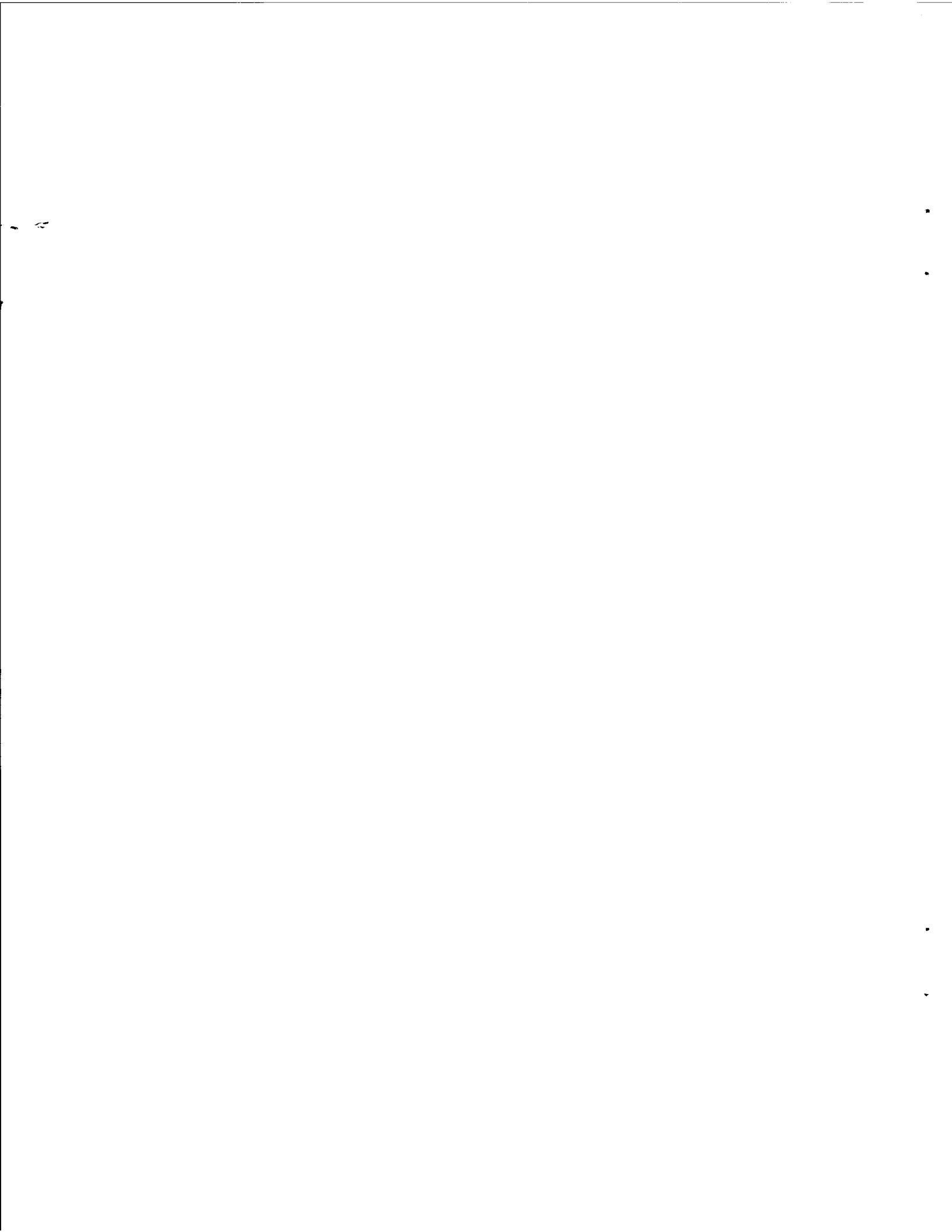
WESTERN AVENUE BRIDGE



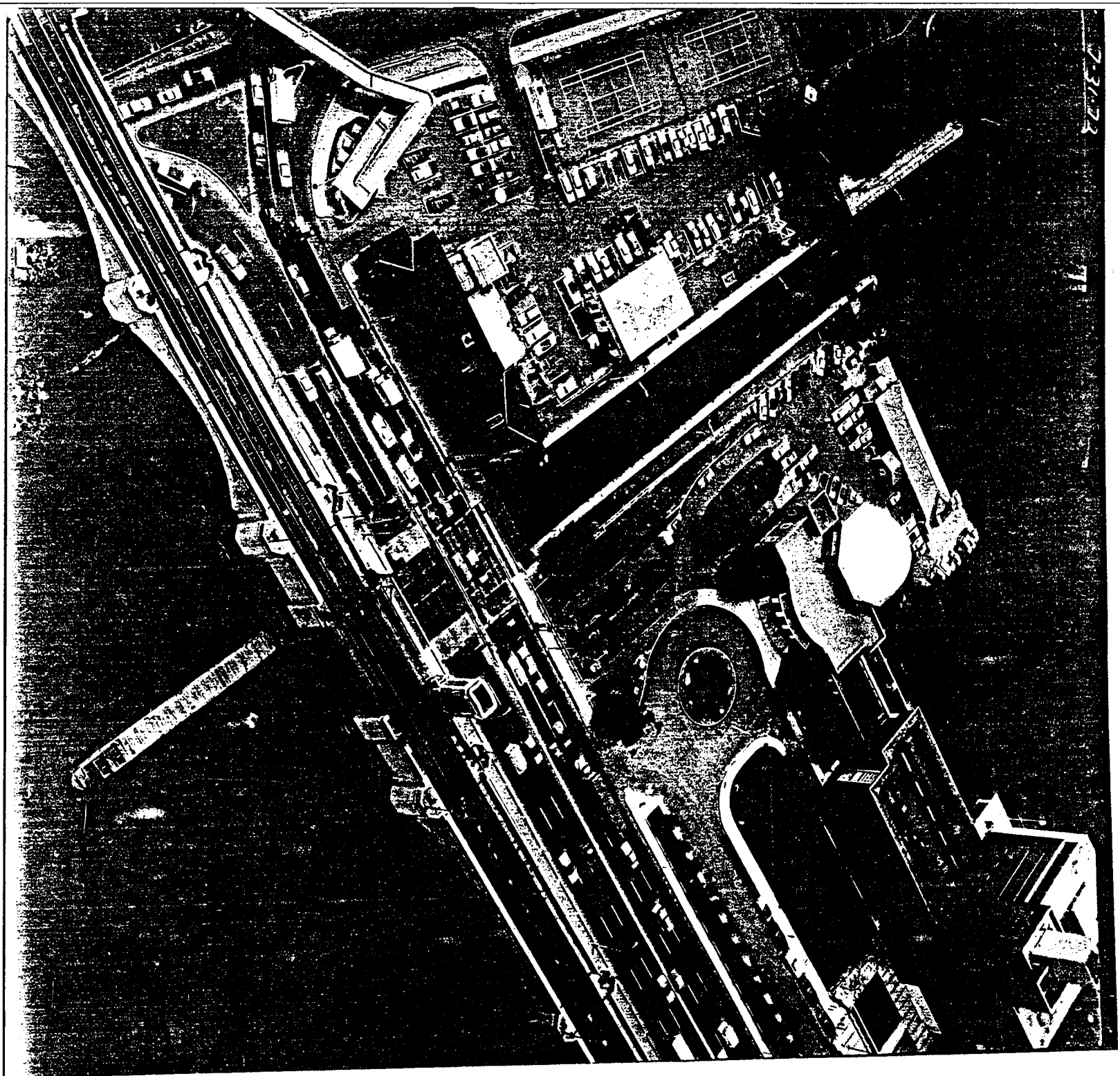


**APPENDIX V**

**AERIAL VIEWS OF THE CHARLES RIVER AND BRIDGES**

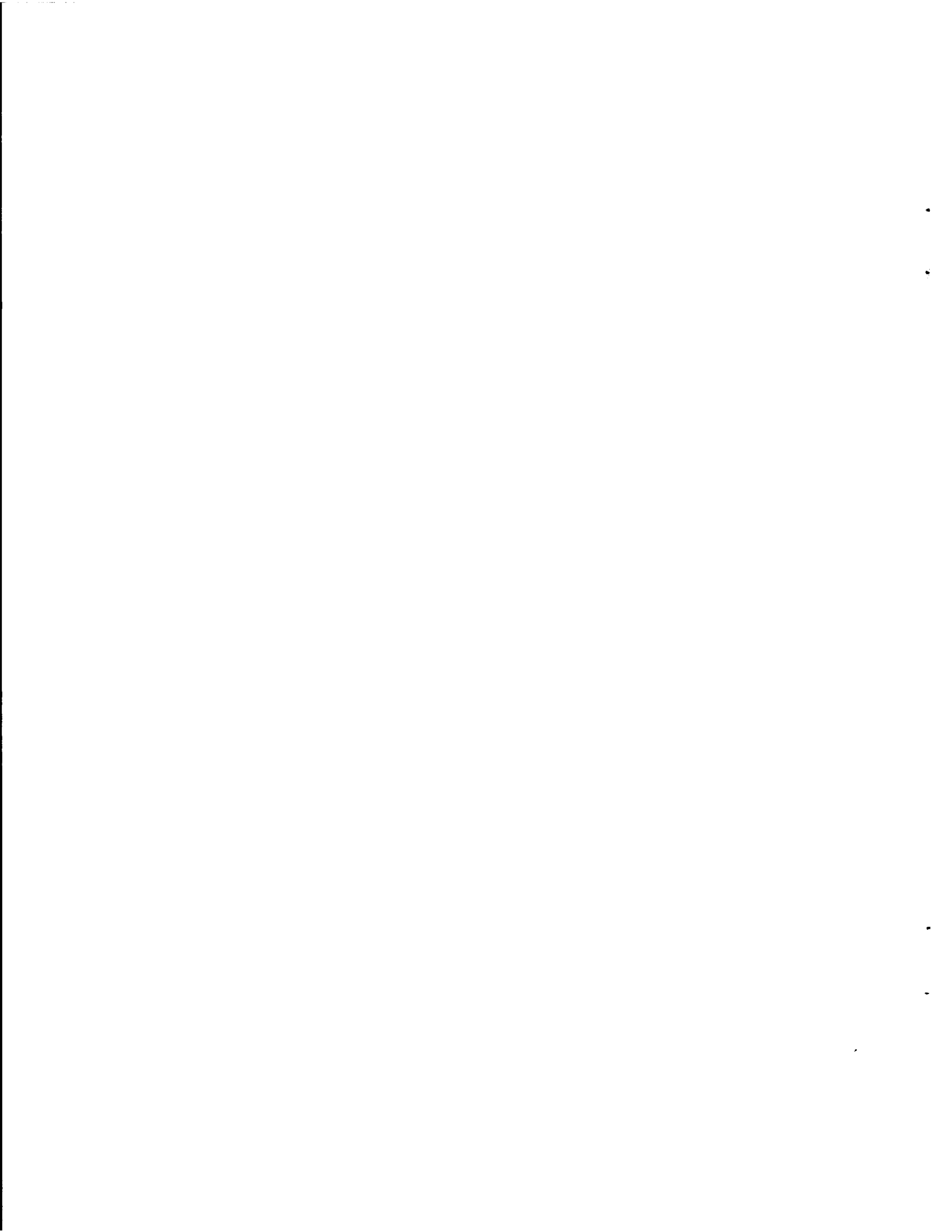


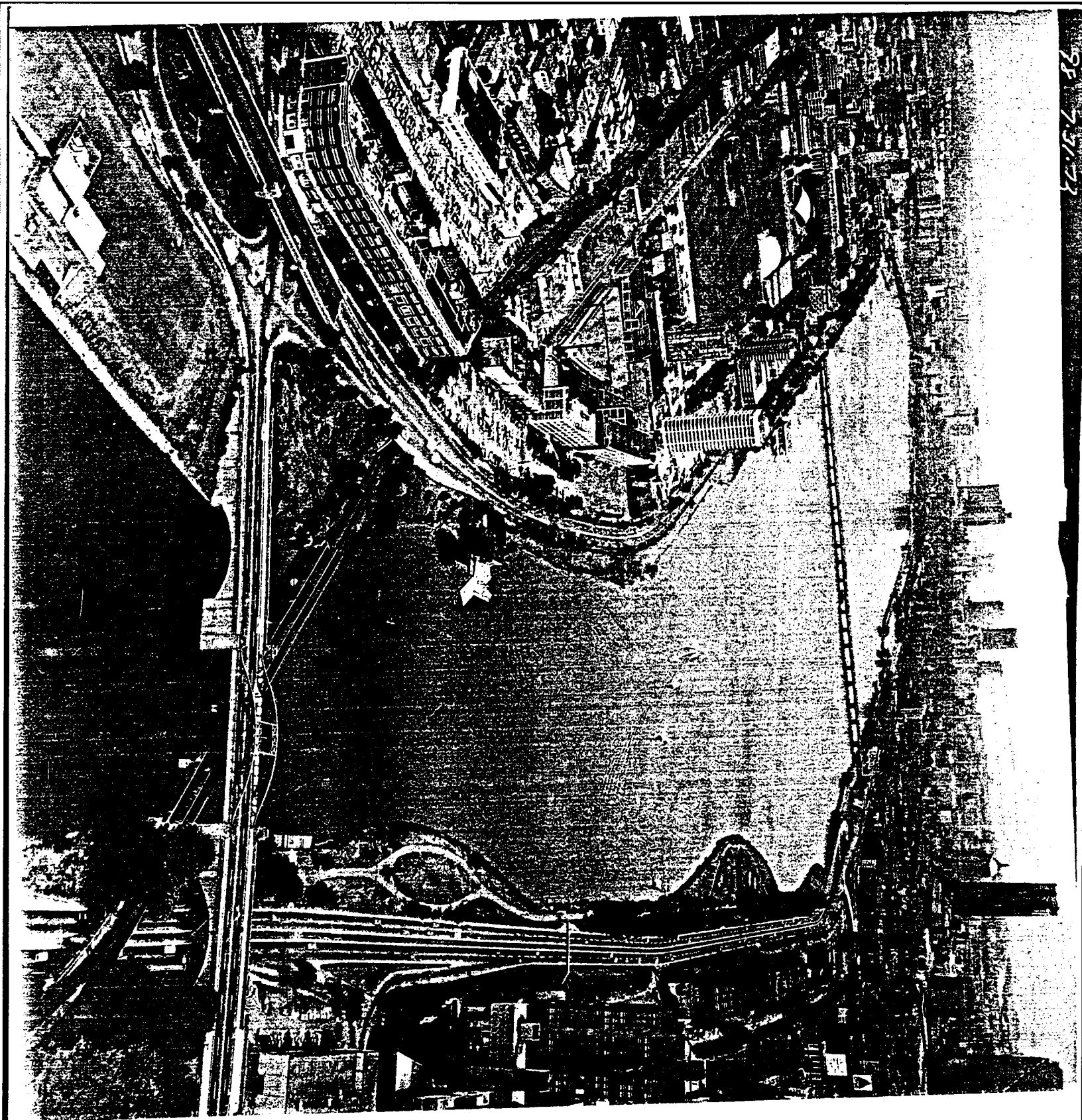




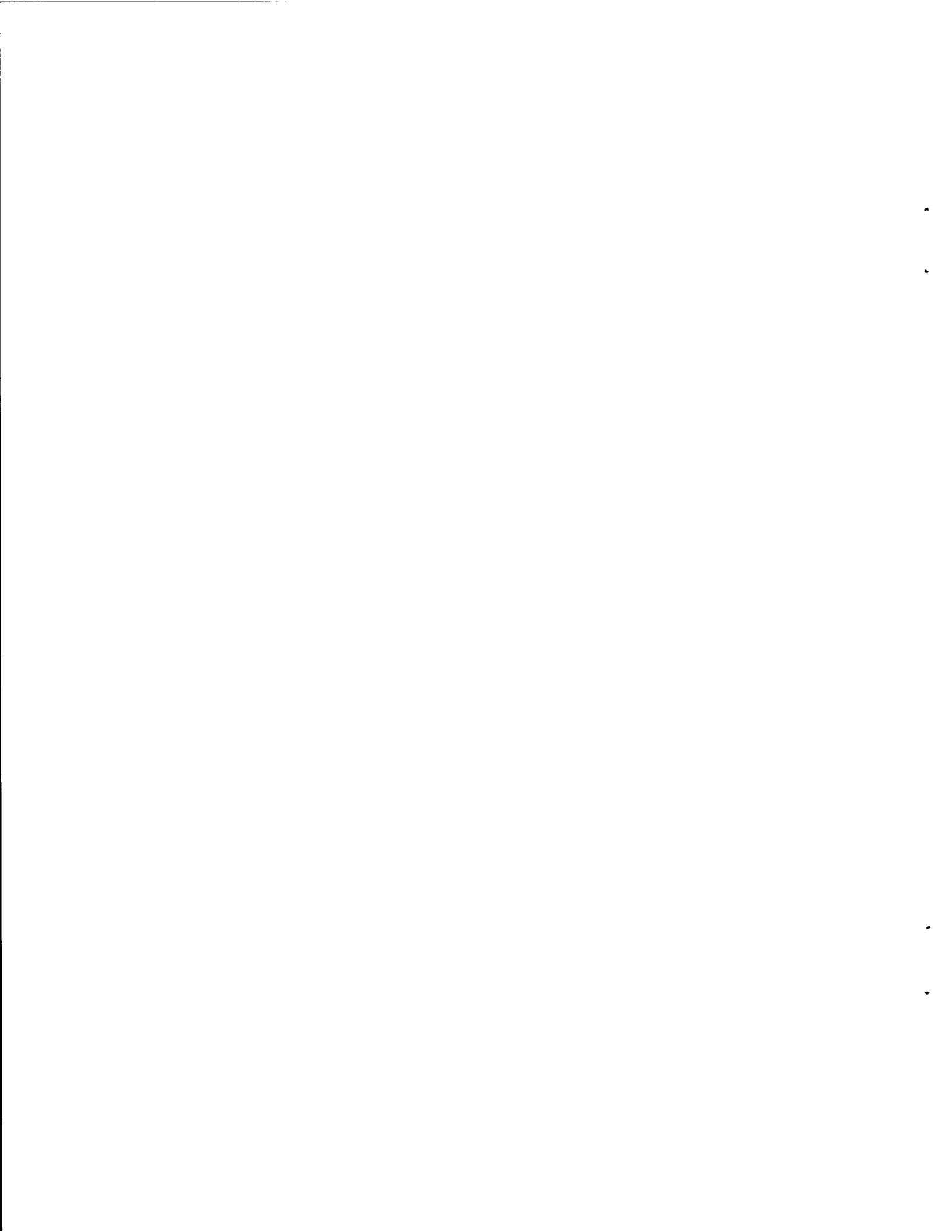
2372

71

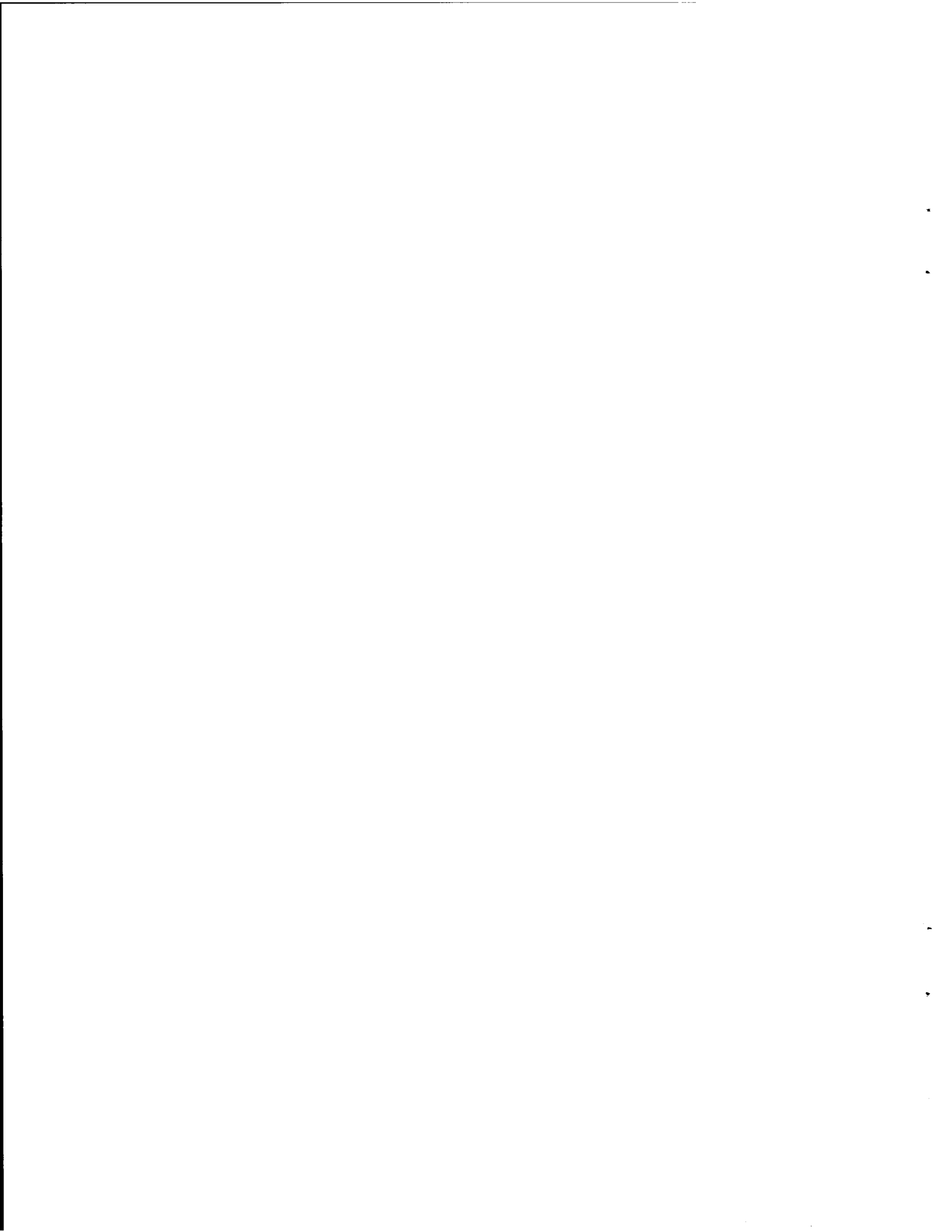


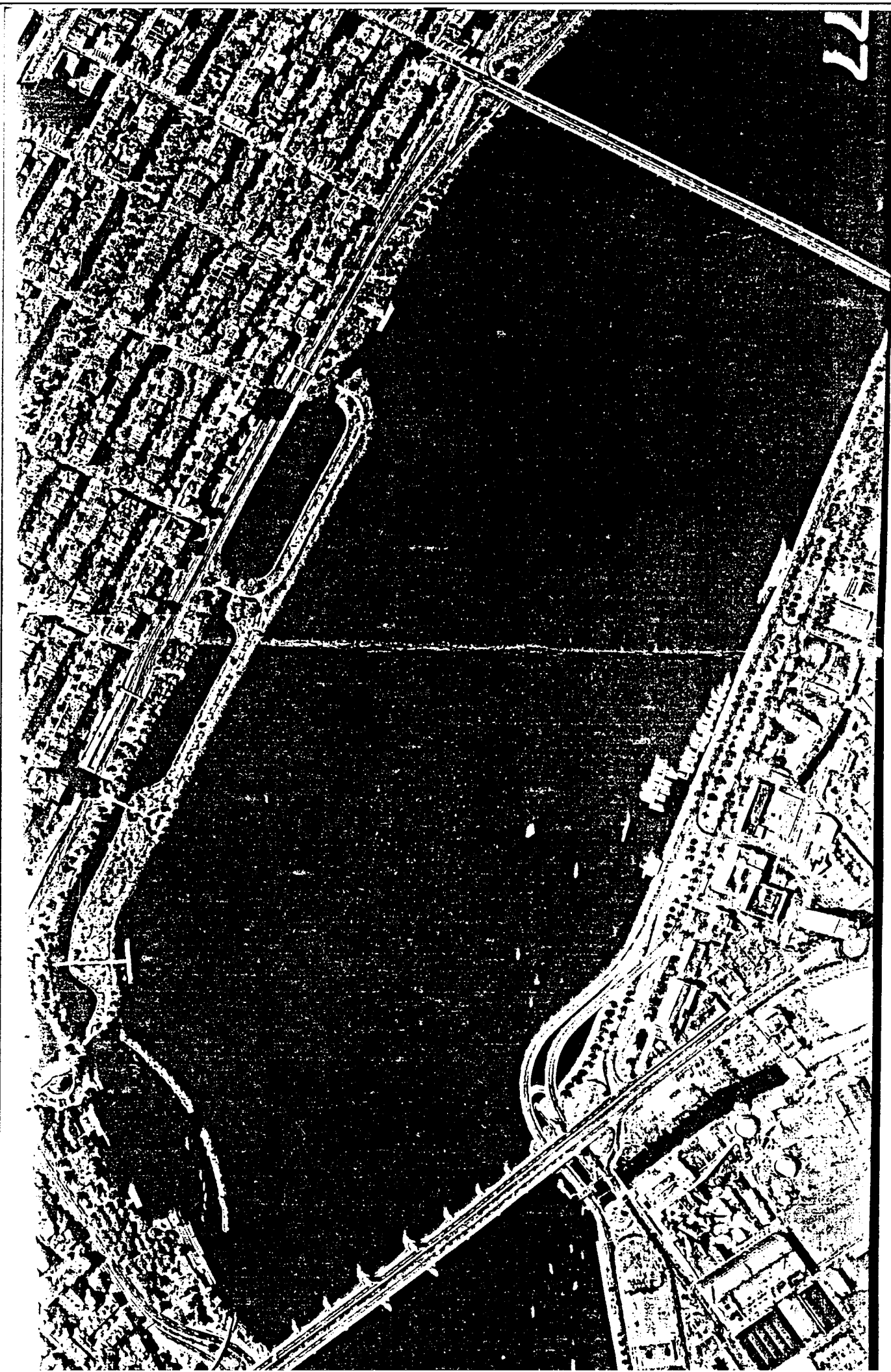


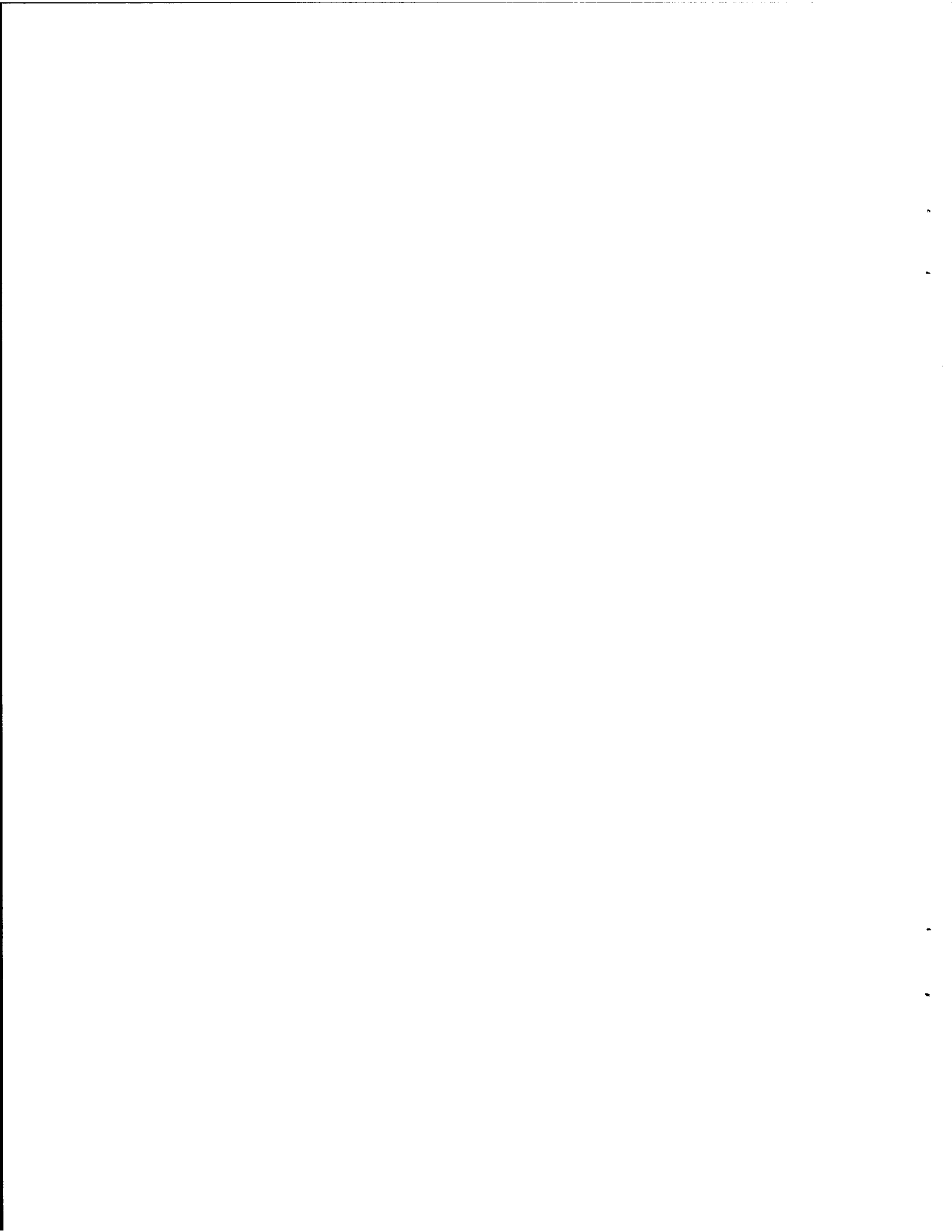
98 7/21/73



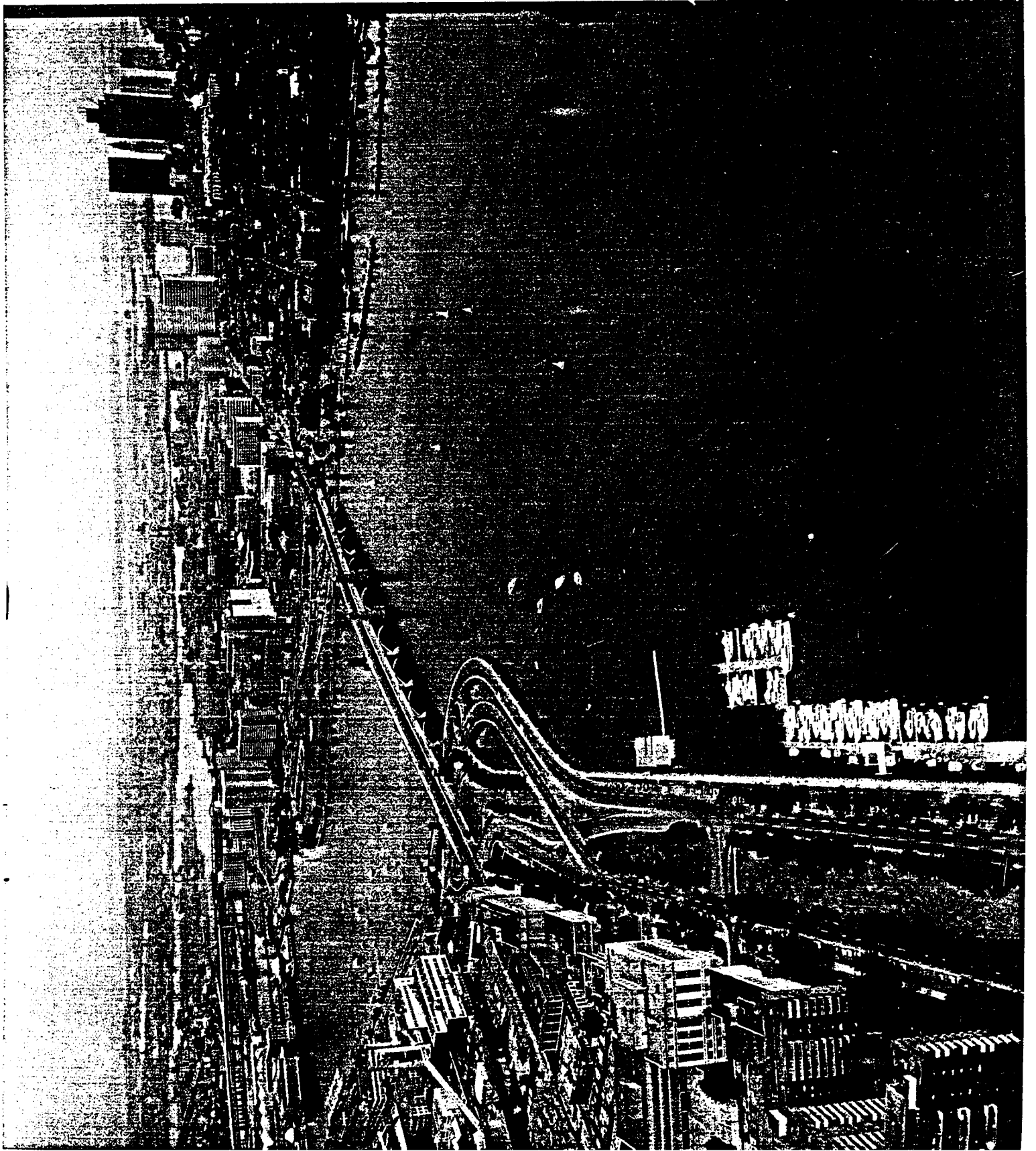


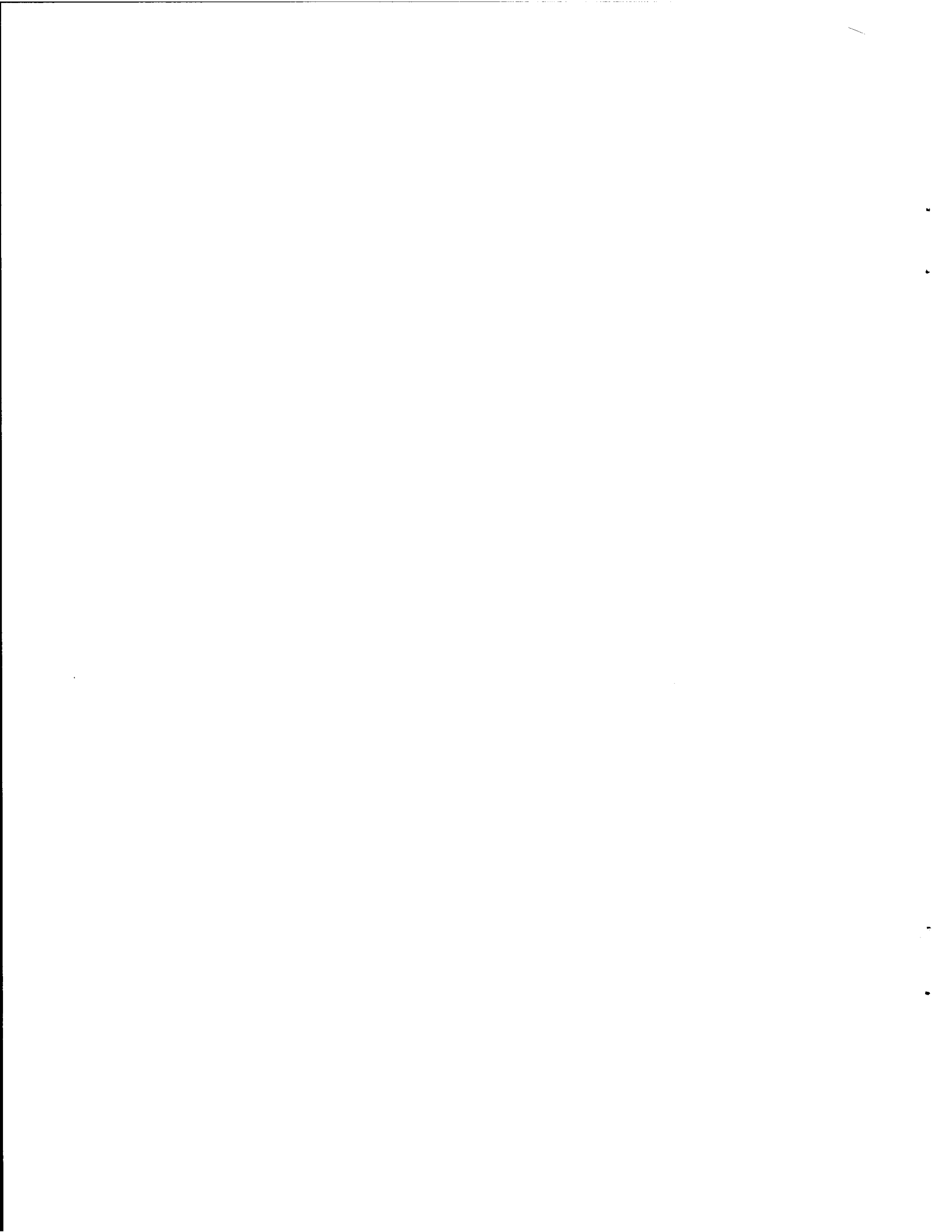


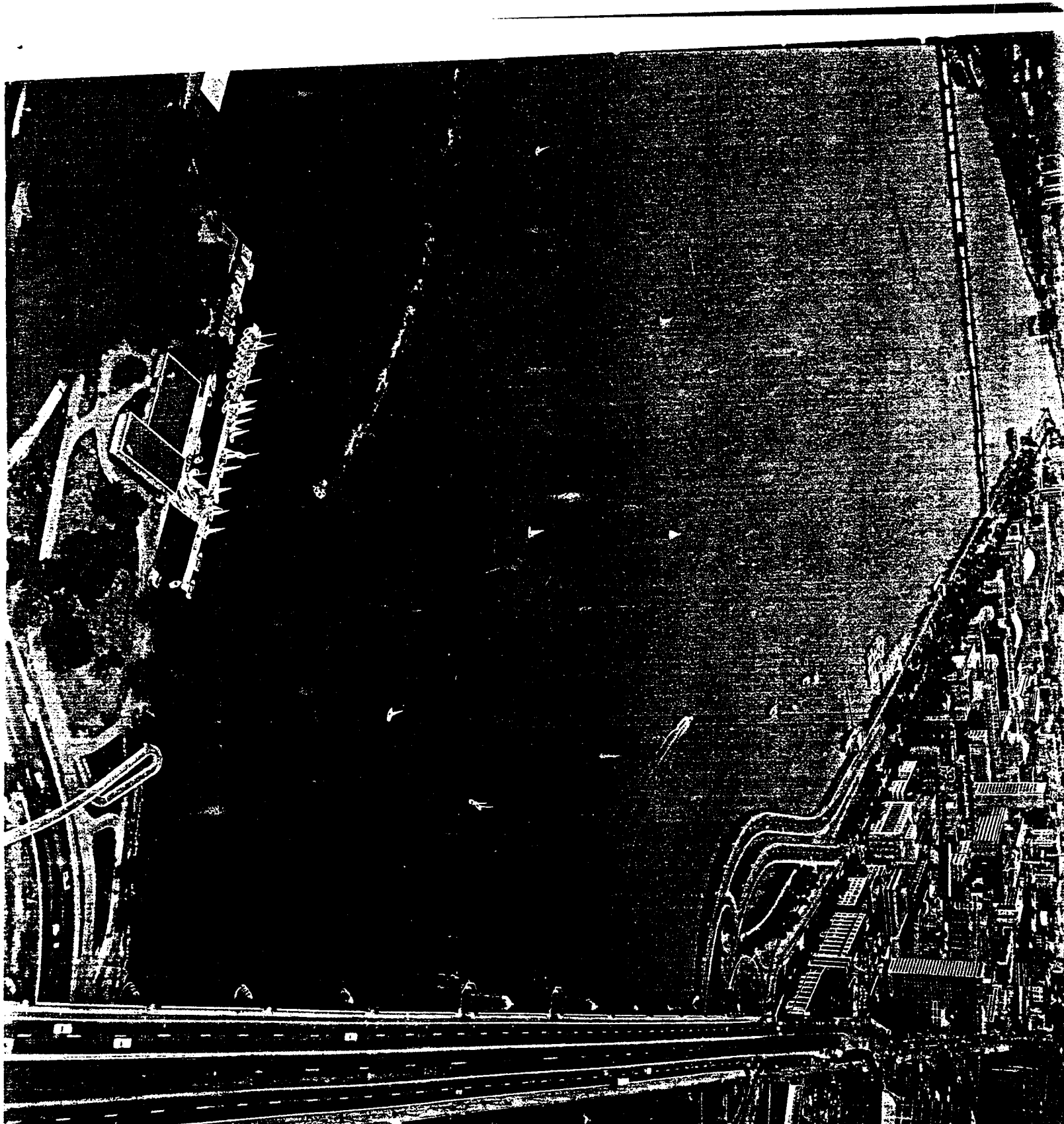


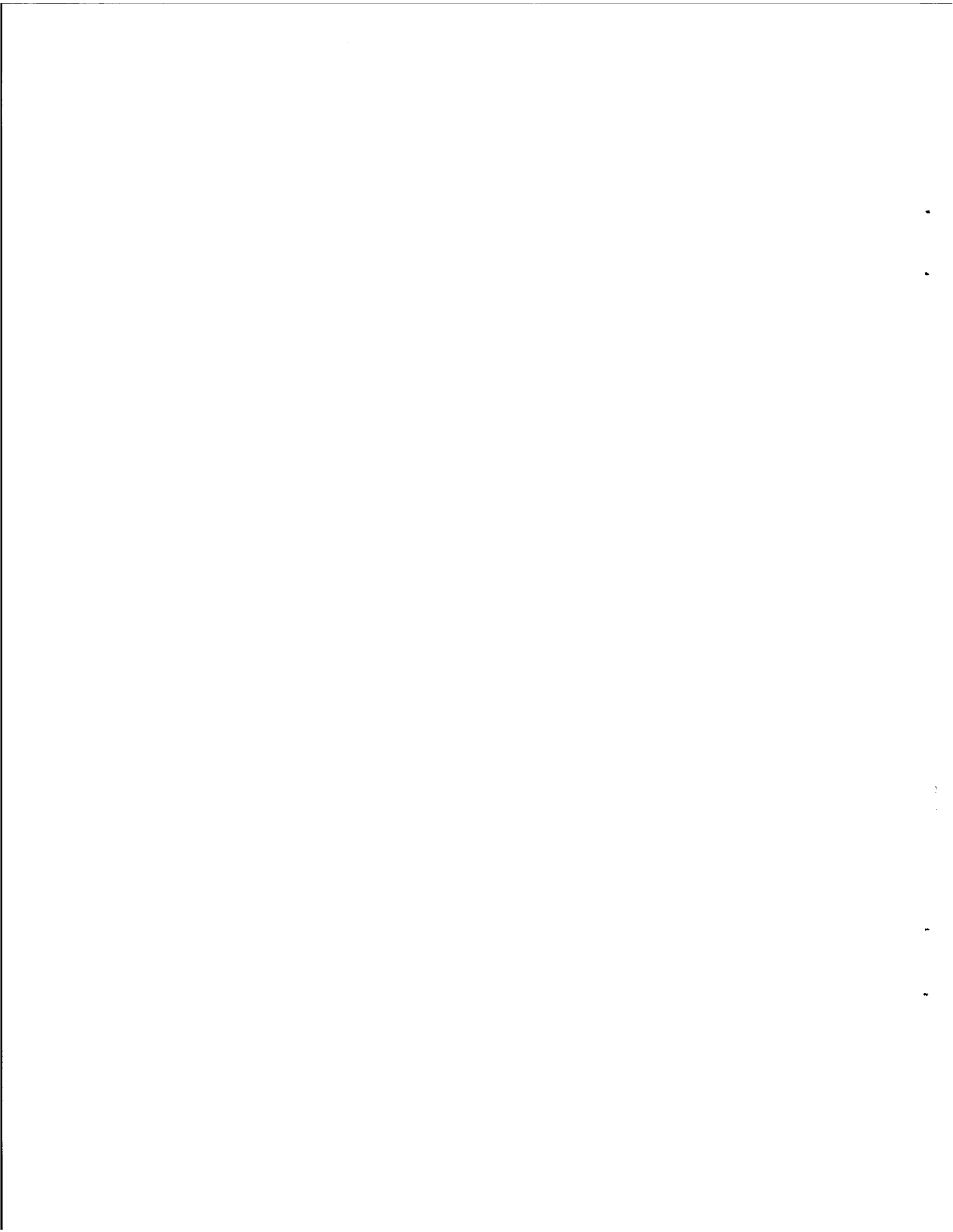




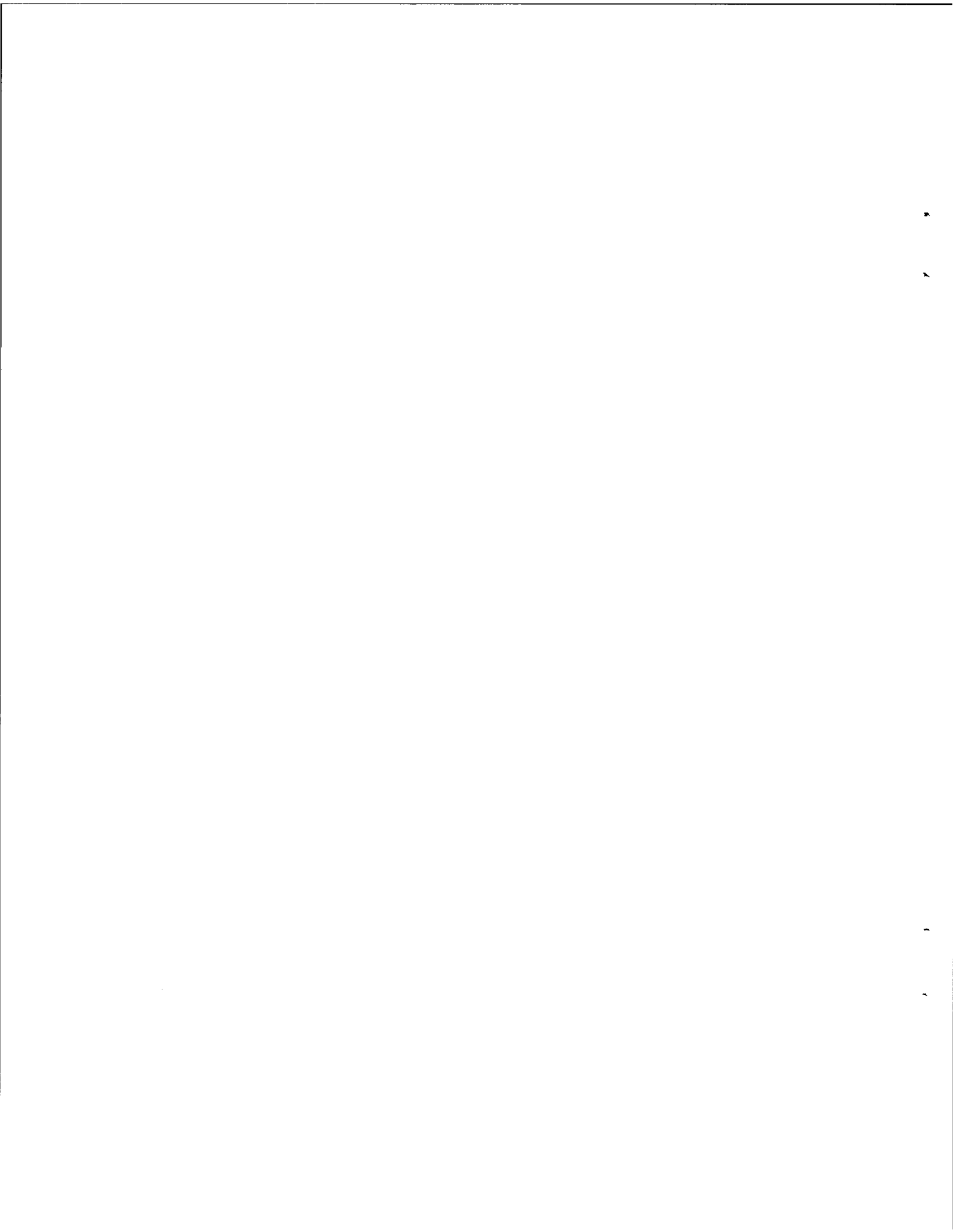




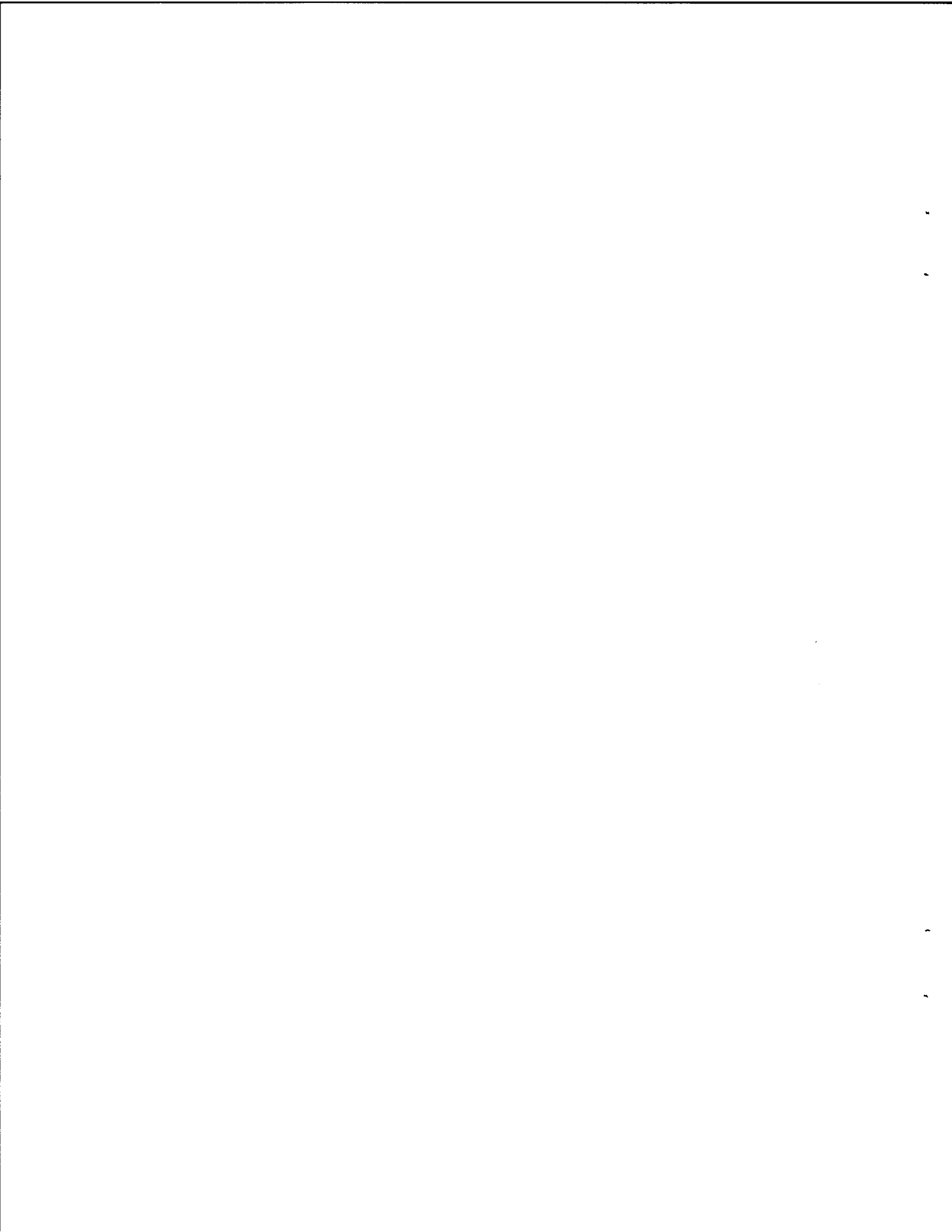






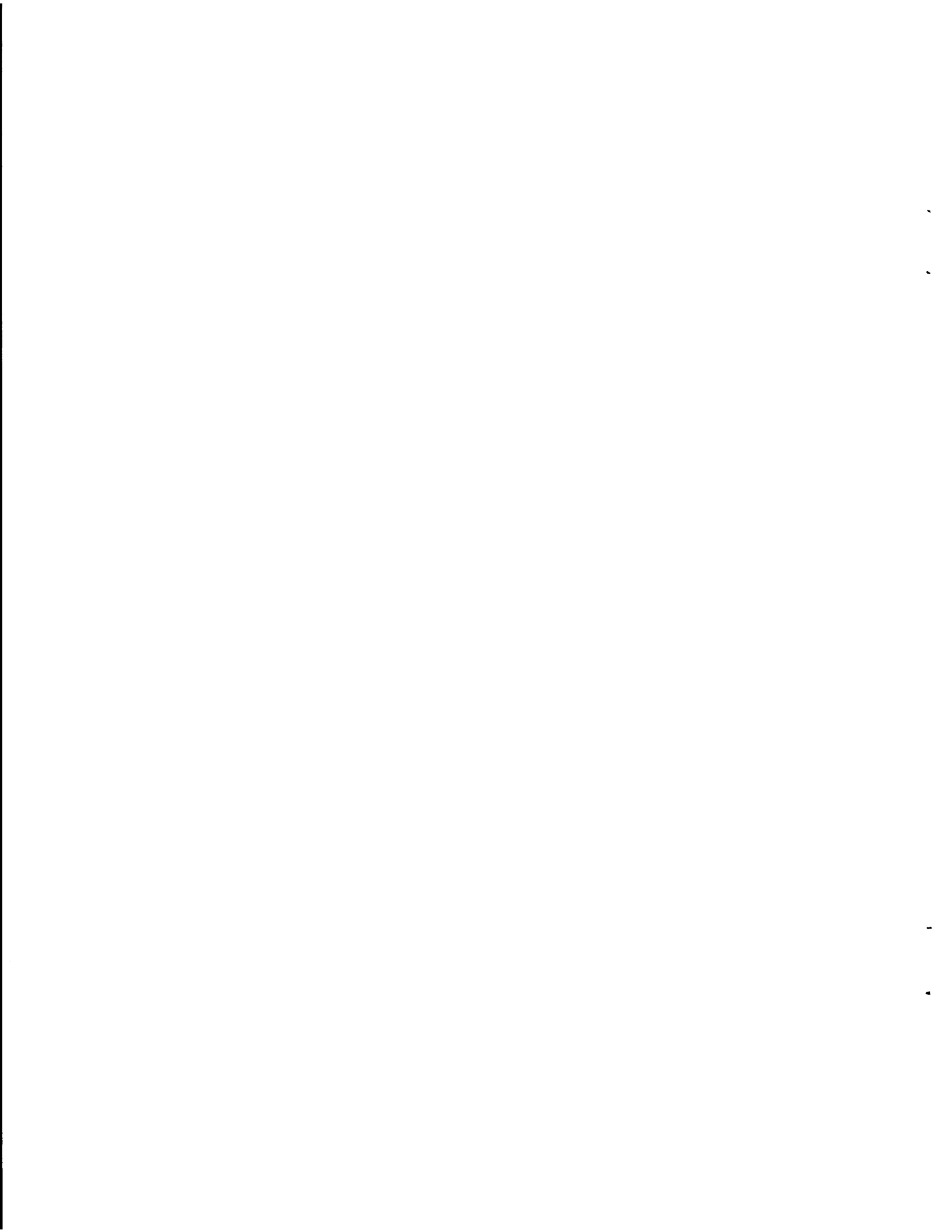


**APPENDIX VI**  
**SAMPLE MBTA SCHEDULE**



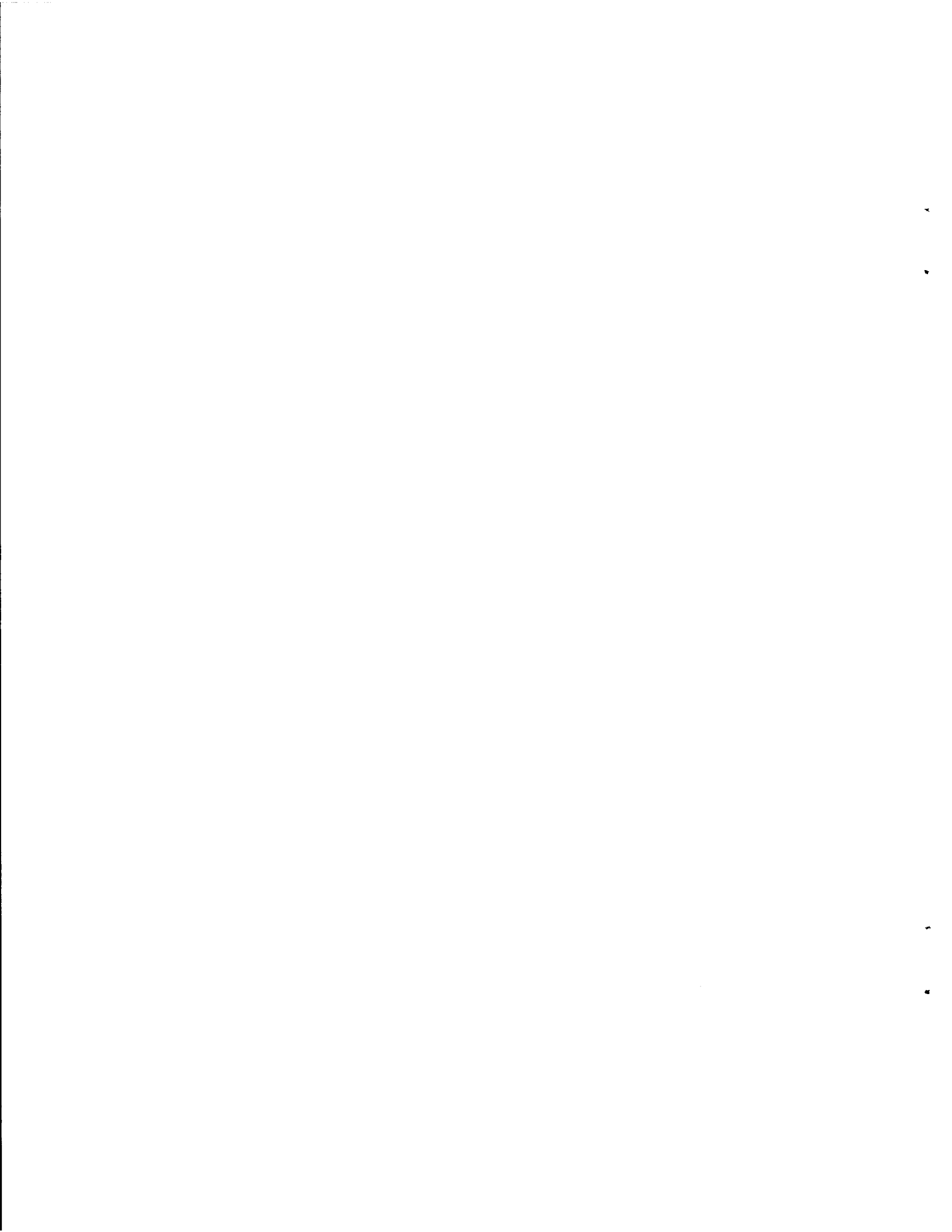






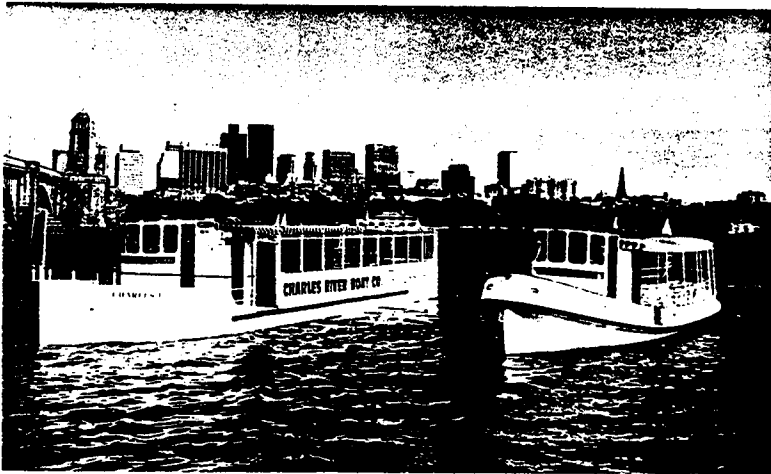
**APPENDIX VII**

**SAMPLE INFORMATION FROM WATER TAXI AND RIVER EXCURSION  
OPERATIONS**



# RIVERBOAT CRUISES

## *On the Charles!*



Come aboard Boston's only riverboats, "Charles I & II", and take a scenic journey up the Charles River. Choose from a variety of cruises that are offered on the Charles River or in Boston Harbor. By day, take a relaxing lunch cruise or sight-seeing voyage while the captain points out historic and interesting sites. By night, enjoy a dinner cruise under the stars as our staff serves culinary delights.

Cruises depart from the Cambridge-side Galleria Mall and the Museum of Science. Whether its sightseeing with a friend, or private charter for your next event, come experience the Charles River.

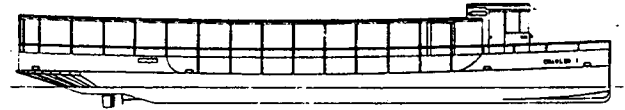
CHARLES RIVERBOAT CO.



100 CAMBRIDGESIDE PLACE, SUITE 320  
CAMBRIDGE, MA 02141  
PHONE 621-3001 FAX 621-3002

CHARLES RIVERBOAT CO.

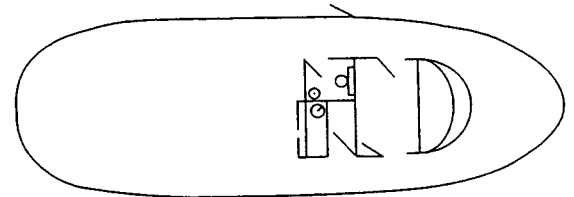
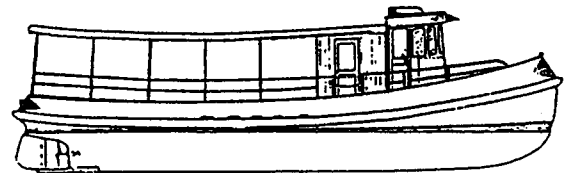
### CHARLES I



Length: 75 feet  
Beam: 16.5 feet  
Coast Guard Certified

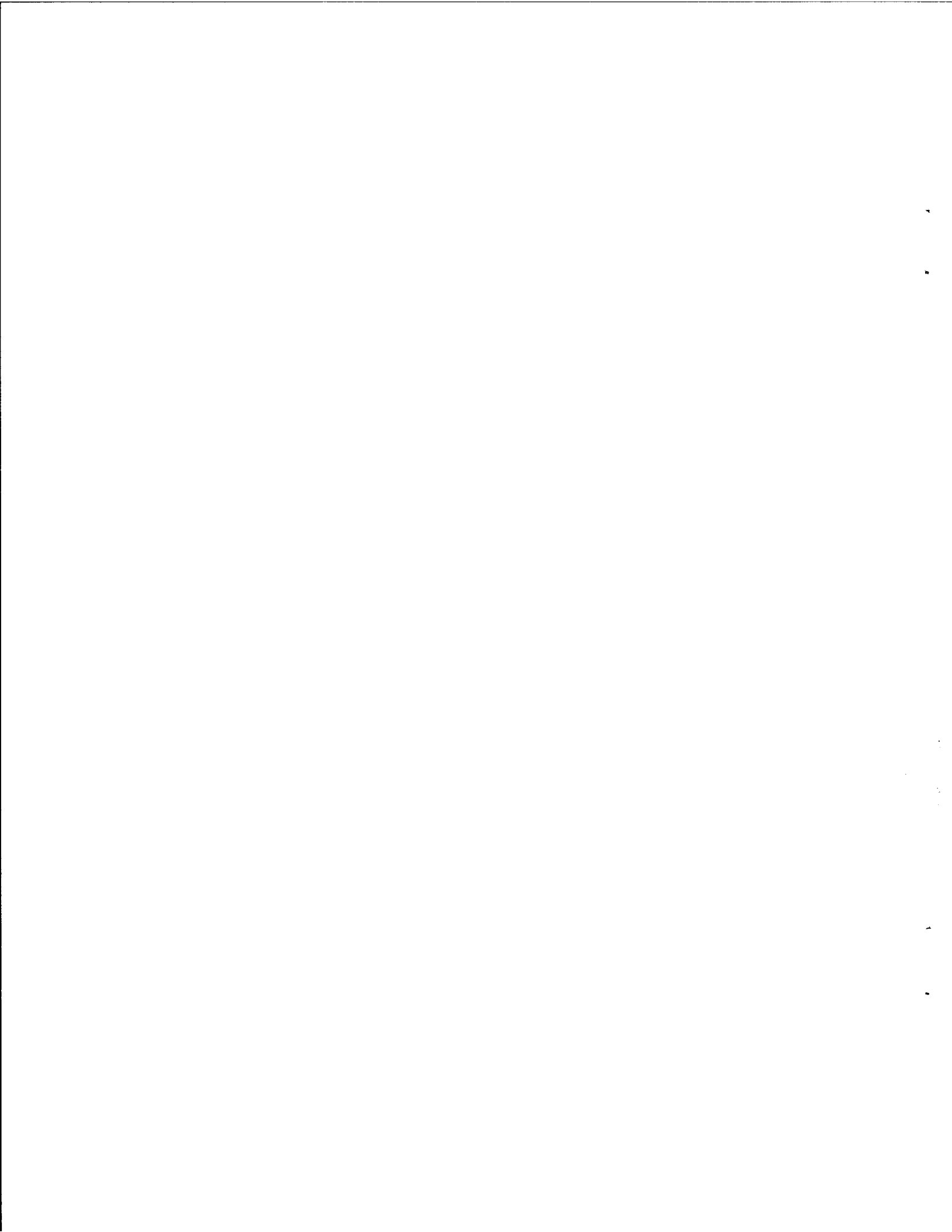
Maximum Seating Capacity:  
Sight-seeing: 110 passengers  
Lunch: 60-90 (sitdown/buffet)  
Dinner: 80 passengers  
Cocktails: 90 passengers

### CHARLES II



Length: 47 feet  
Beam: 14 feet  
Coast Guard Certified

Maximum Seating Capacity:  
Sight-seeing: 49 passengers  
Lunch: 25-40 (sitdown/buffet)  
Dinner: 25 passengers  
Cocktails: 40 passengers

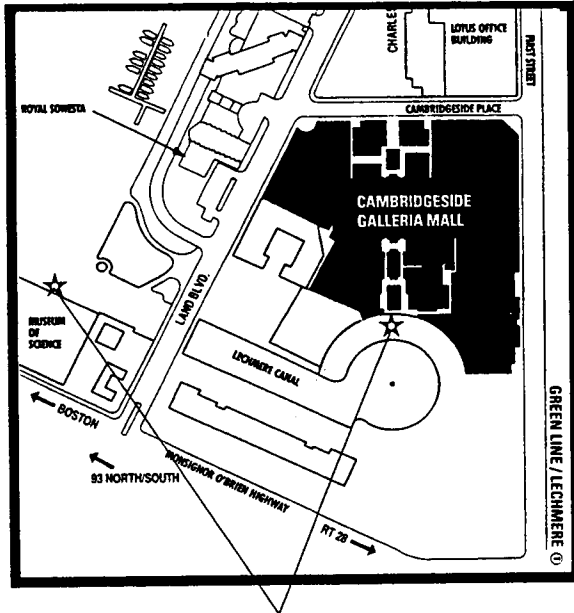


## SIGHTSEEING CRUISES

A 50 minute narrated tour. Steam up the Charles River Basin to the Esplanade, B.U., & M.I.T. and see the countless sailboats and rowing shells. Enjoy the views of the city and the riverbanks while learning the unique history of the Charles River.

Adults	\$7.00
Children	\$5.00
Seniors	\$6.00

Tours begin at 12:00 noon and depart every hour until 5:00 p.m.



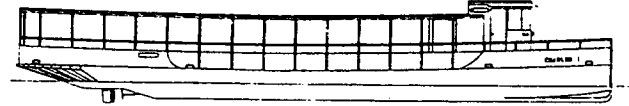
### Charles River Boat Co.

For a unique event, please inquire regarding our lunch and dinner cruises and private charters. Enjoy a delicious meal while seeing the sights of the riverbanks, including the Esplanade and Harvard University. Then travel through the locks into Boston Harbor to see "Old Ironsides".

For Reservations and Information:  
Call 617-621-3001

## CHARLES RIVERBOAT CO.

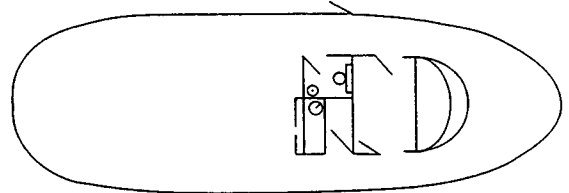
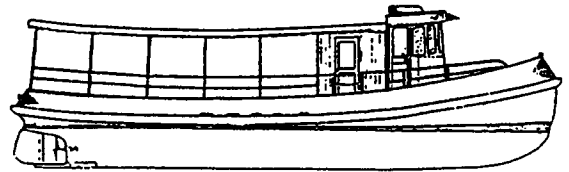
### CHARLES I



Length: 75 feet  
Beam: 16.5 feet  
Coast Guard Certified

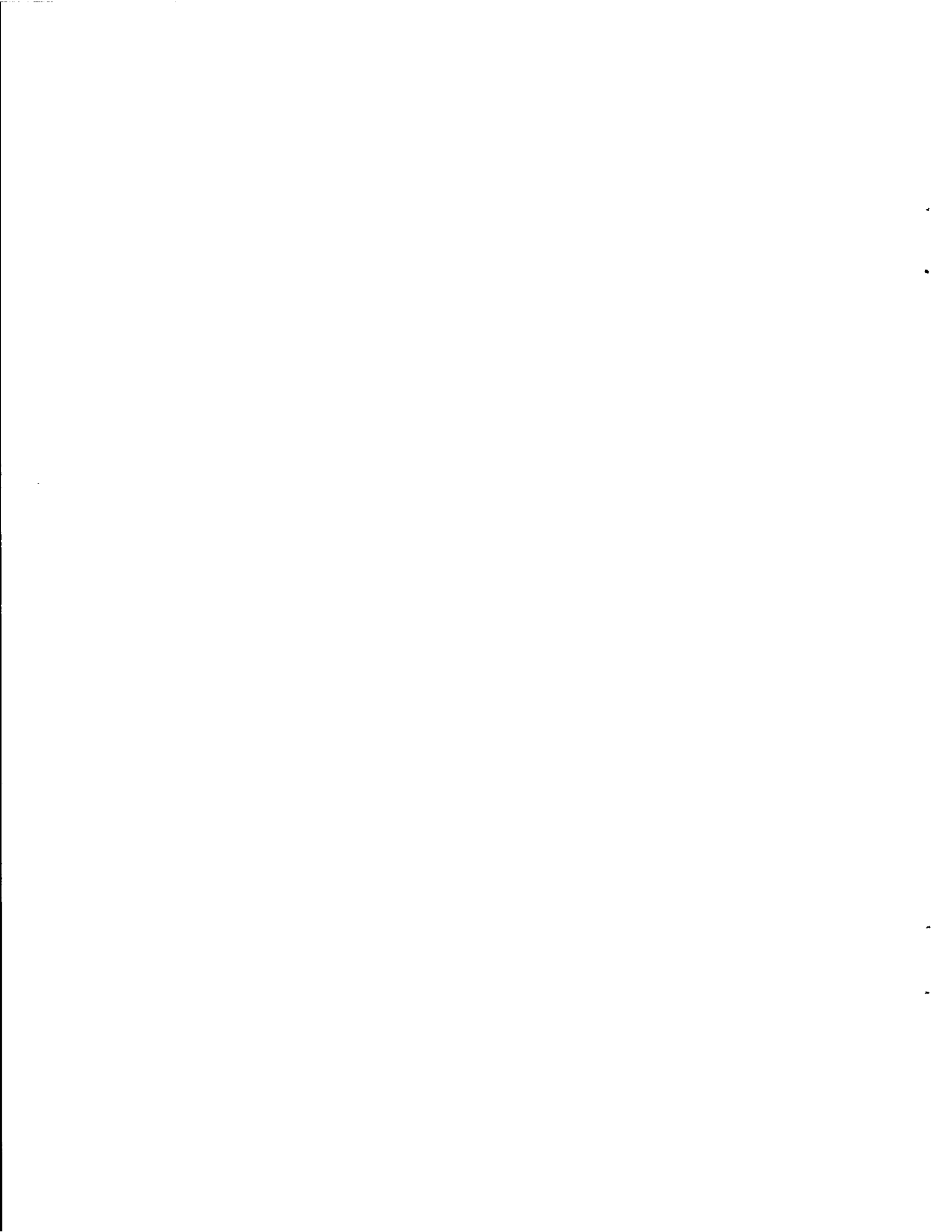
Maximum Seating Capacity:  
Sight-seeing: 110 passengers  
Lunch: 60-90 (sitdown/buffet)  
Dinner: 80 passengers  
Cocktails: 90 passengers

### CHARLES II



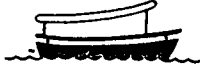
Length: 47 feet  
Beam: 14 feet  
Coast Guard Certified

Maximum Seating Capacity:  
Sight-seeing: 49 passengers  
Lunch: 25-40 (sitdown/buffet)  
Dinner: 25 passengers  
Cocktails: 40 passengers





# MIAMI by Water Taxi



## SHUTTLE SERVICE

Continuous from 10:00 AM - 2:30 AM every 15-20 minutes

- Biscayne Marriott** 1  
Omni Int'l Mall  
Omni Hotel  
Grand Prix  
Plaza Venetia
- Walson Island** 2  
Chalk's Airline
- Bicentennial Park** 3  
(Events only)
- Bayside** 4
- Hard Rock Cafe** 5  
(Bayside East)
- ALL TRANSFERS** ←
- Intercontinental Hotel** 6  
(at Bayfront Park)
- Dupont Plaza Hotel** 7
- Sheraton Biscayne** 8
- Barnett Plaza** 9
- Brickell Key** 10
- Hyatt Regency** 11  
Convention Center  
Parc Suite Hotel  
Bijon
- Big Fish\*** 12
- East Coast Fisheries\*** 13

\*On Request



## BISCAYNE BAY SERVICE

See time schedule to right for Biscayne Bay Service

- 14 **Miami Beach Marina**  
Nick's Miami Beach  
Joe's Stone Crab
- 15 **Fisher Island**  
Proper I.D. Required
- 16 **Hard Rock Cafe**  
(Bayside East)
- 17 **Rusty Pelican\***  
Rickenbacker Marina
- 18 **Miami Seaquarium\***  
(Daytime only)
- 19 **Sunday's on the Bay\***  
Crandon Park
- 20 **Monty's**  
Coconut Grove
- 21 **Viscaya\***  
(Daytime only)

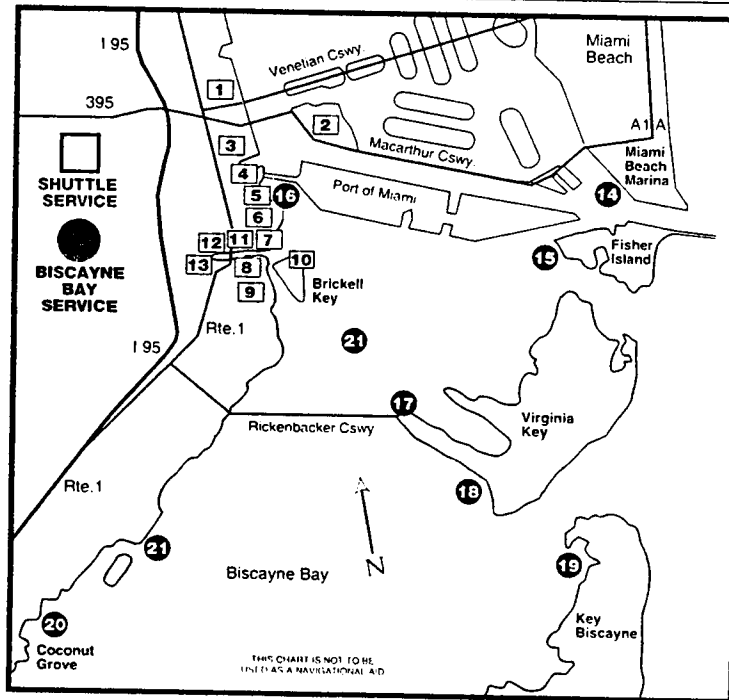
\*On Request

Hard Rock Cafe (Bayside East) to Miami Beach every hour on the 1/2 hour from 11:30 AM to 12:30 AM... Fri & Sat to 2:30 AM

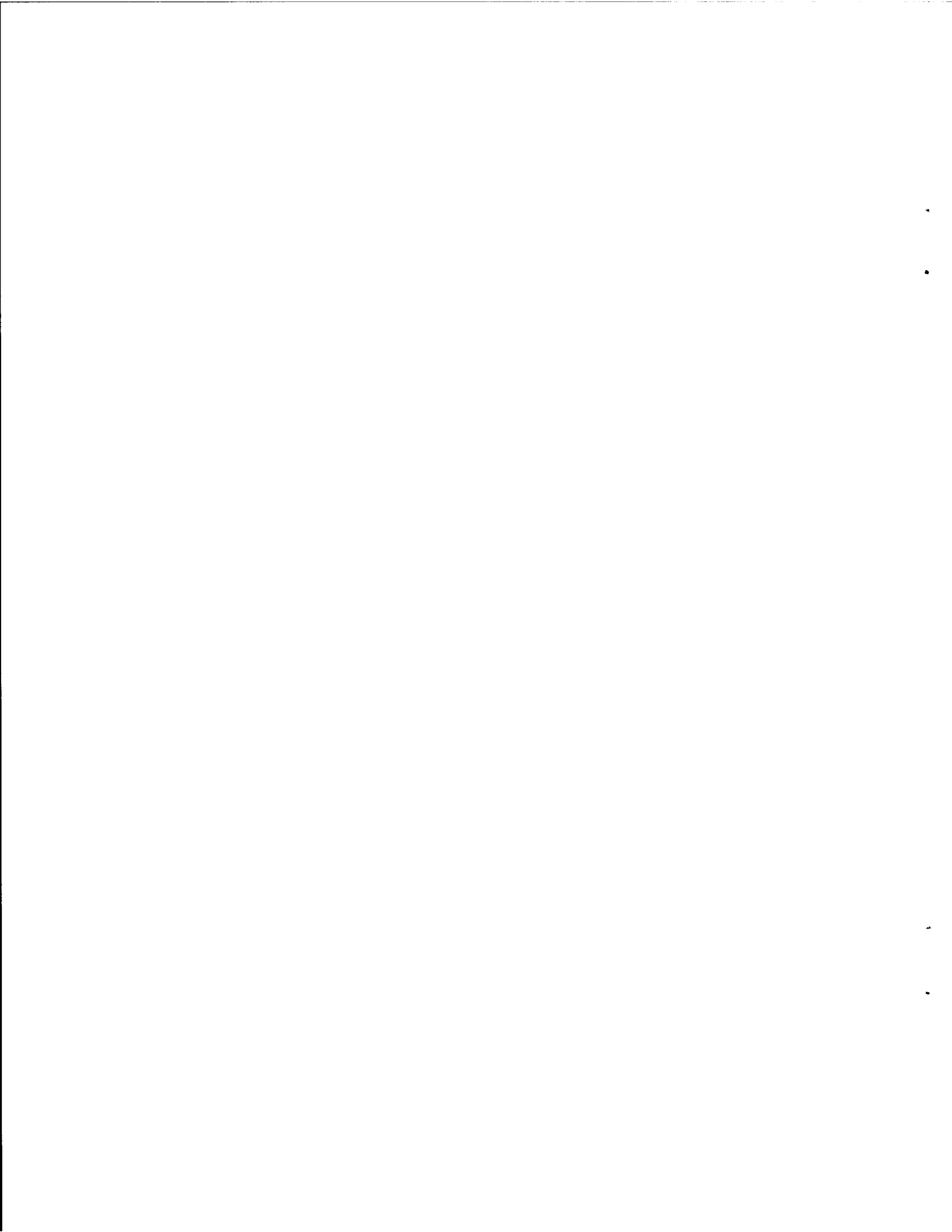
Miami Beach to Hard Rock Cafe (Bayside East) every hour on the hour from 12:00 Noon to Midnight... Fri & Sat to 2:00 AM

Hard Rock Cafe (Bayside East) to Monty's every 2 hours from 10:30 AM to 12:30 AM... Fri & Sat to 2:30 AM

Monty's to Hard Rock Cafe (Bayside East) every 2 hours from 9:30 AM to 11:30 PM... Fri & Sat to 1:30 AM



305-858-6292



**FARES** from 17th St. Causeway to Hillsboro Blvd. and west on the New River...

**\$ 3.00** shuttle fare per person / **EACH WAY**

- Shuttle Areas:
- 17th Street Restaurants & Hotel Inc Convention Center
  - Oakland Park Restaurants
  - Broward Center for Performing Arts to Shirltail Charley's and Riverwalk to the S.E. 3rd Avenue Bridge.
  - Between Bahia Cabana, Bahia Mar, RJ's Landing & Coconuts

**\$ 6.00** per person / **EACH WAY**  
**\$ 12.00** per person / **ROUND TRIP**  
**\$ 14.00** per person / **ALL DAY PASS** - entitles passenger to unlimited use of WATER TAXI during that day's operation

**\$ 45.00** per person / **FREQUENT FLOATER PASS** entitles passenger to unlimited use of WATER TAXI for a week (seven consecutive days). Photo I.D. required.

**\$100.00** **SUPER FLOATER PASS** - entitles holder to 25 one-way rides including transfers within the Water Taxi Route System...bring your friends along for the ride.

•• Children under 12 accompanied by an adult half price. Infants held on your lap FREE.

WATER TAXI operates ON DEMAND, like a shared land taxi, seven days a week from 10AM until the wee hours. WATER TAXIS carry up to 27 passengers and the "SUPER TAXIS" carry 48 passengers in air-conditioned comfort.

WATER TAXI can be chartered for private parties such as birthday's, progressive dinner parties, bride & groom get-a-ways, or just cruising. Special hourly and corporate rates start as low as \$80.00 per hour.

WATER TAXI tour packages including Historic Tours, Mansions & Marina Tours, Scavenger Hunts, Las Olas Shopping Trips, Lauderdale Loop and many others are available for groups of 15 or more.

**WATER TAXI**

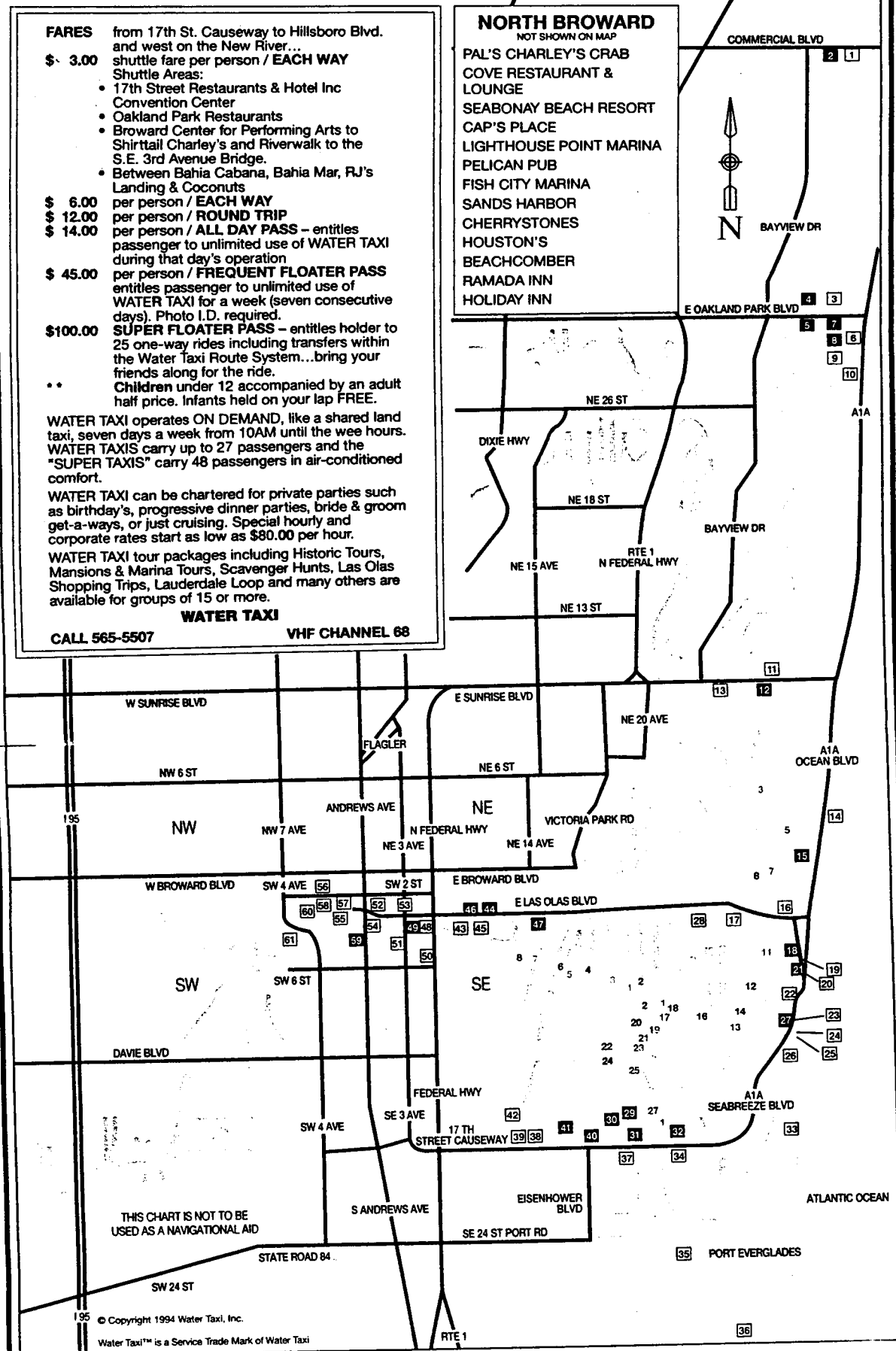
CALL 565-5507

VHF CHANNEL 68

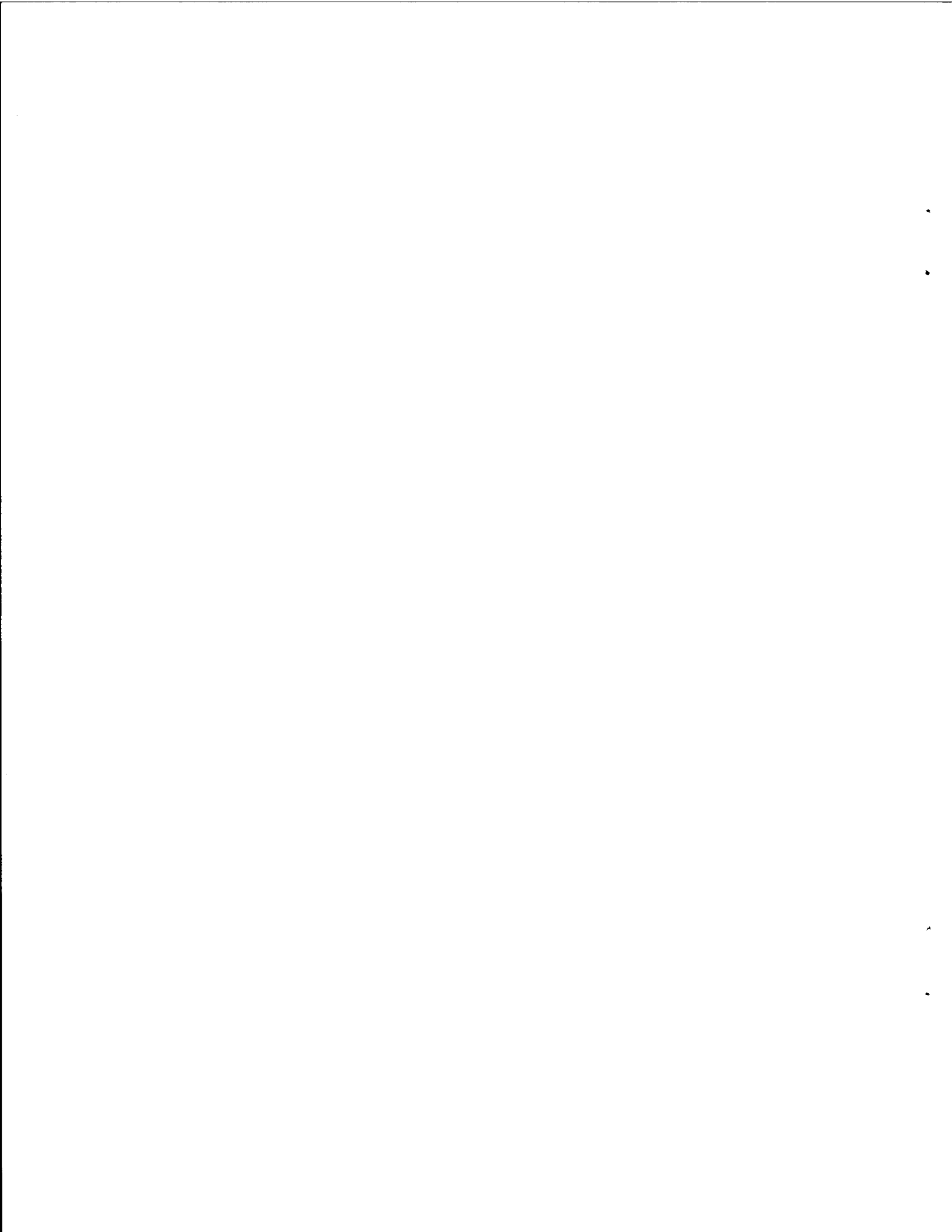
**NORTH BROWARD**

NOT SHOWN ON MAP

- PAL'S CHARLEY'S CRAB
- COVE RESTAURANT & LOUNGE
- SEABONAY BEACH RESORT
- CAP'S PLACE
- LIGHTHOUSE POINT MARINA
- PELICAN PUB
- FISH CITY MARINA
- SANDS HARBOR
- CHERRYSTONES
- HOUSTON'S
- BEACHCOMBER
- RAMADA INN
- HOLIDAY INN

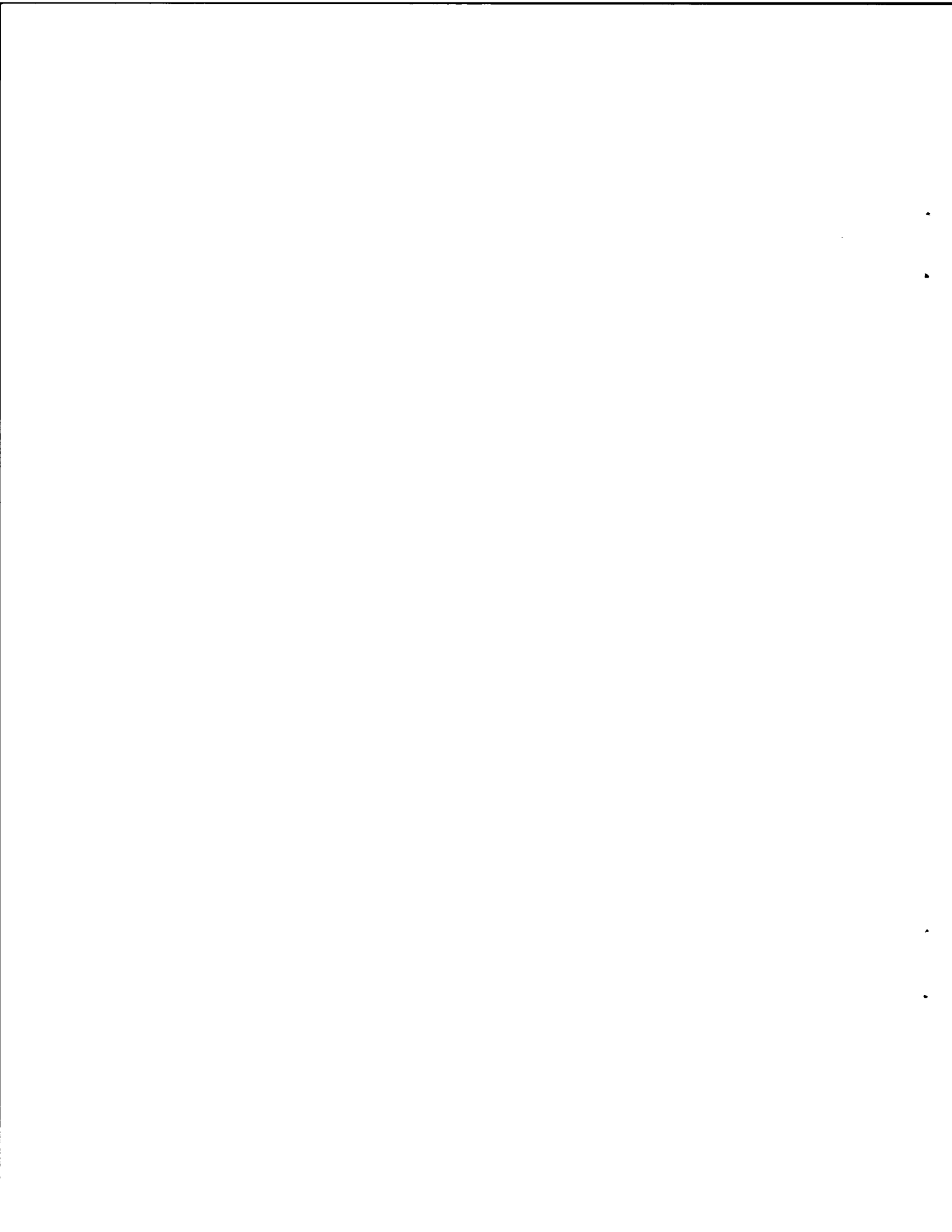


THIS CHART IS NOT TO BE USED AS A NAVIGATIONAL AID



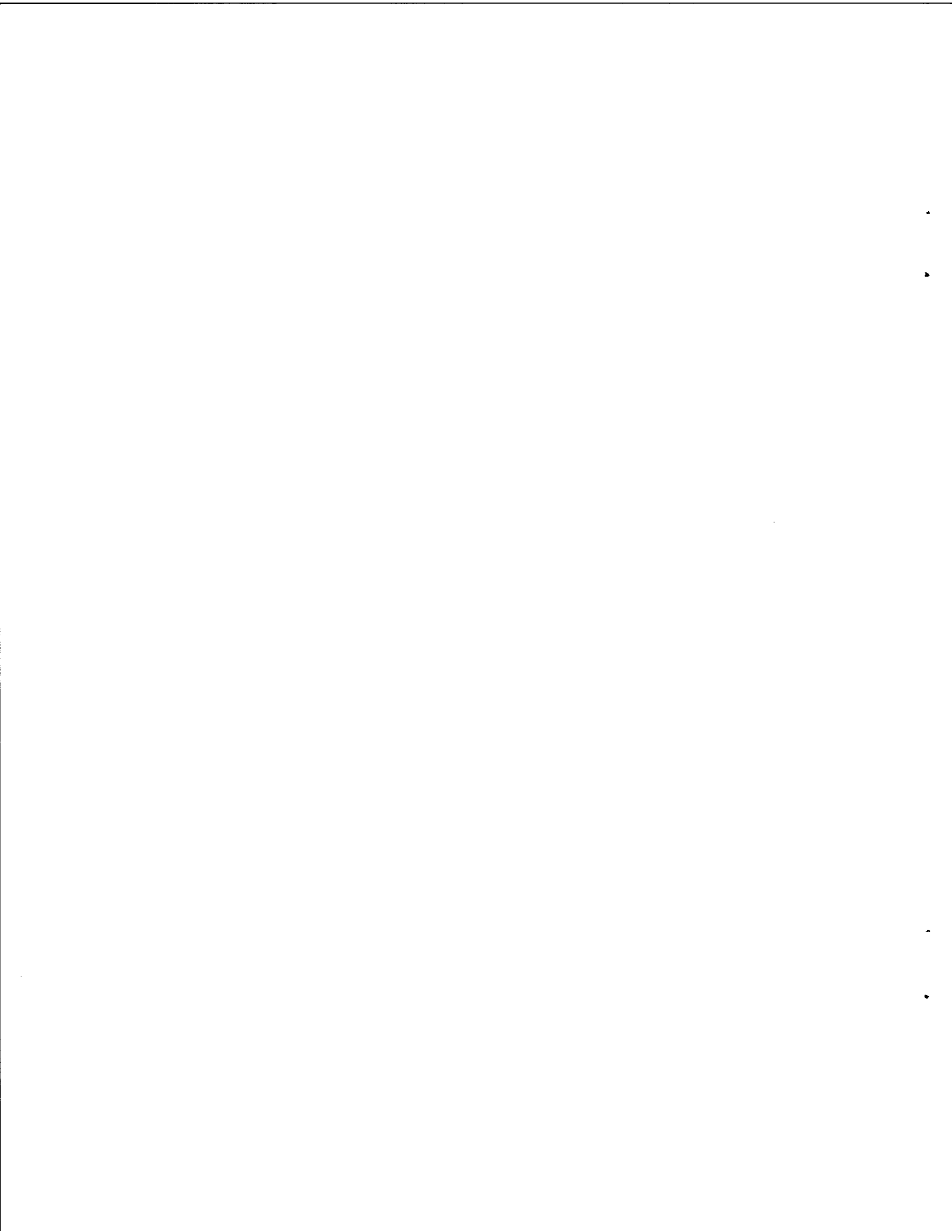
## WATER TAXI ROUTE PICKUP GUIDE / South Broward

- |                           |                                      |  |                                    |
|---------------------------|--------------------------------------|--|------------------------------------|
| 1. Benihana               | 16. Municipal Marina                 | 30. LAUDERDALE MARINA                      | 46. OHARA'S PUB                    |
| <b>2. ROADHOUSE GRILL</b> | 17. Municipal Anchorage              | <b>31. MARRIOTT MARINA<br/>&amp; HOTEL</b> | <b>47. INTERCOASTAL<br/>REALTY</b> |
| 3. La Reserve             | <b>18. COCONUTS</b>                  | <b>32. PIER 66-PELICAN BAR</b>             | 48. Stranahan House                |
| <b>4. YESTERDAY'S</b>     | 19. Hall of Fame Marina              | 33. Lago-Mar Hotel                         | <b>49. CARRIE B</b>                |
| <b>5. DOWN UNDER</b>      | 20. Swimming Hall of Fame            | 34. Marina Motor Inn                       | 50. Municipal Docks                |
| 6. Mombasa Bay            | <b>21. R J'S LANDING</b>             | 35. Port Everglades                        | 51. Riverwalk                      |
| <b>7. SHOOTER'S</b>       | 22. Bahia Mar                        | 36. John Lloyd State Park                  | 52. Museum of Art                  |
| <b>8. BOOTLEGGERS</b>     | 23. Jungle Queen                     | 37. Convention Center                      | 53. Bubier Park                    |
| 9. Charley's Crab         | 24. Sheraton Clipper                 | 38. Kevin's Deli                           | 54. New River Saloon               |
| 10. Paddlewheel Queen     | 25. Best Western Oceanside           | 39. Charlie's Locker                       | 55. Chart House                    |
| 11. Careless Navigator    | 26. Marriott Harbor Beach            | <b>40. OCEAN WORLD</b>                     | 56. Museum of Discovery<br>& Imax  |
| <b>12. GUEST QUARTERS</b> | <b>27. BAHIA CABANA</b>              | <b>41. BIMINI BOAT YARD</b>                | 57. Olde Towne Chop House          |
| 13. Galleria Mall         | 28. Le Dome                          | 42. Southport Raw Bar                      | 58. Riverwalk Esplanade            |
| 14. Sheraton Trader       | <b>29. 15TH STREET<br/>FISHERIES</b> | <b>44. MANGOS</b>                          | <b>59. SHIRTTAIL CHARLIE'S</b>     |
| <b>15. GO FISH</b>        |                                      | 45. Las Olas Shoppes/<br>Riverside Hotel   | 60. Performing Arts Center         |
|                           |                                      |  | 61. Cooley's Landing Marina        |



**APPENDIX VIII**

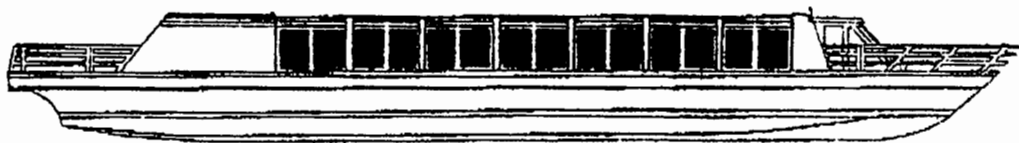
**EXAMPLE COMMUTER AND WATER TAXI VESSEL SPECIFICATIONS**



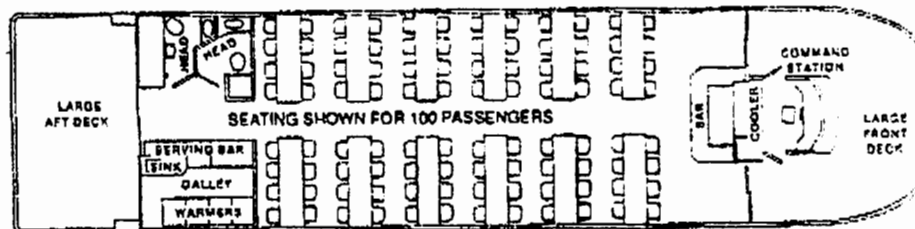


# SKIPPERLINER

*Where Excellence Takes To The Water*



Profile Sketch

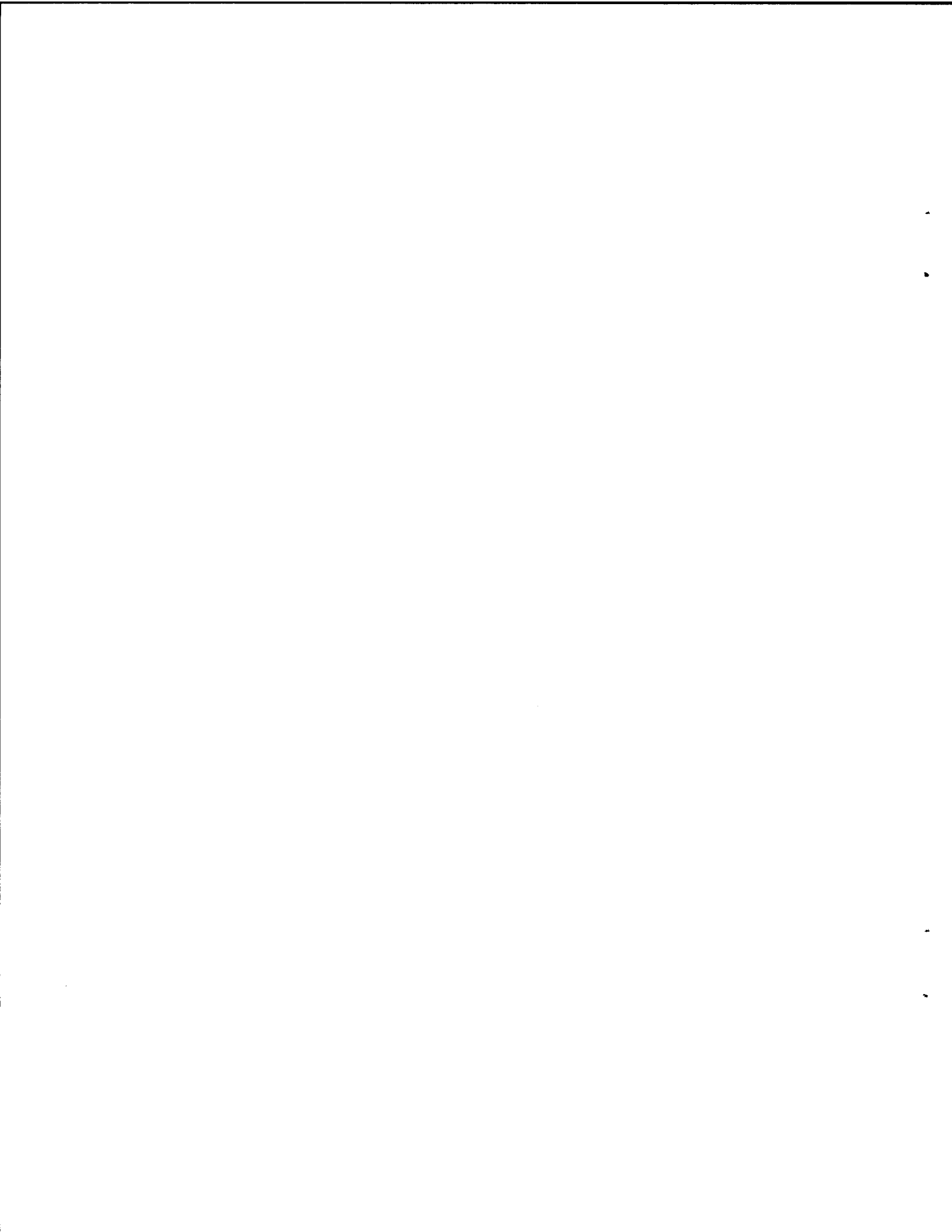


Deck Arrangement

**150 Passenger Canal Boat  
Model: EC 1500**

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**GENERAL SPECIFICATIONS**



# CRUISE SHIPS - EUROPEAN CANAL BOATS



M/V Edelweiss I and II - Winner of a "TOP BOAT OF THE YEAR AWARD."

## A UNIQUE OPPORTUNITY

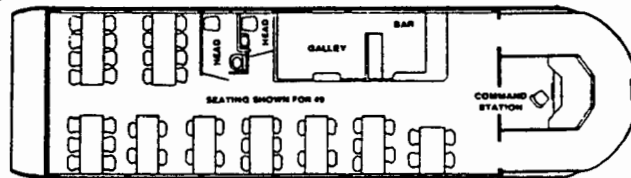
SkipperLiner's European Canal Boat offers a unique vessel for touring as well as a vessel that catches the eye of a passer-by. These vessels produce a maximum of 8'6" air draft, a great application in areas with low bridges.

*"This quality is evident in the detailed construction and materials and also in the thoughtful engineering and practical design that makes the functional application perfect for our needs. We thank you for your total effort and commitment to deliver on time."*

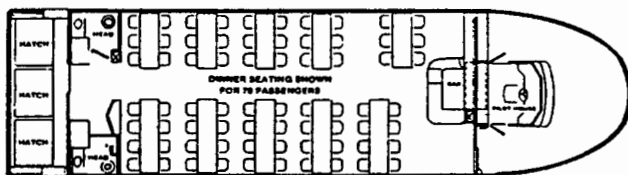
**Hans Weissgerber -  
Milwaukee, WI  
MV Edelweiss I and II**



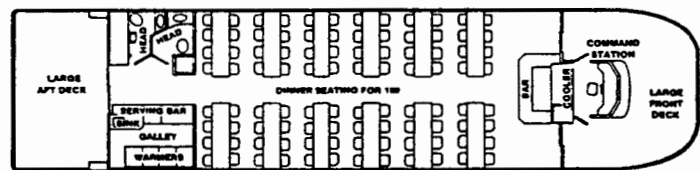
DINING AREA



LOA 52' Beam 16' Draft 34" Capacity 49  
EC 490



LOA 64' Beam 18' Draft 32" Capacity 100  
EC 1000



LOA 74' Beam 20' Draft 42" Capacity 150  
EC 1500



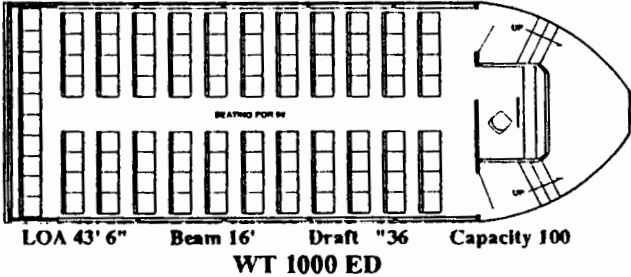
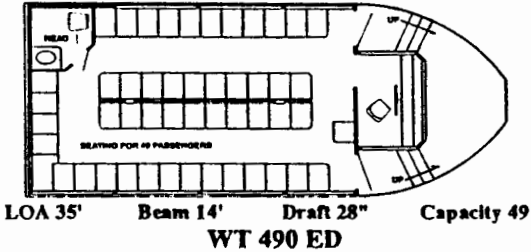
# CRUISE SHIPS - WATER TAXI

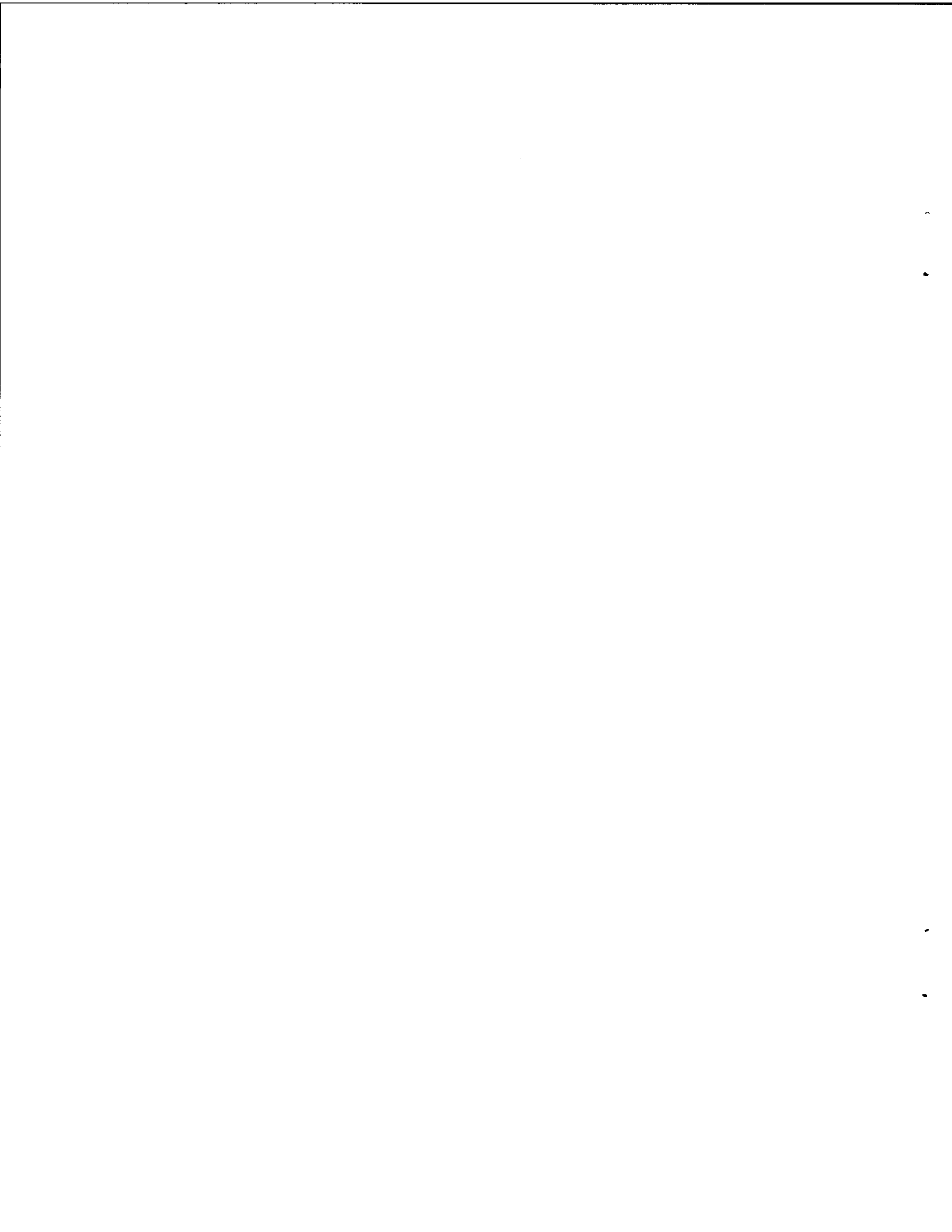


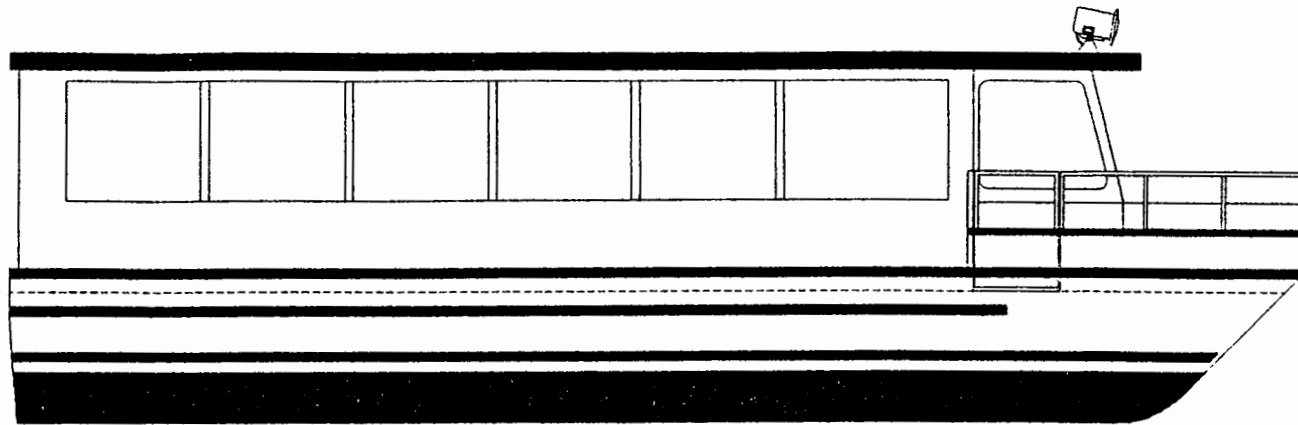
Our water taxi will provide you with an economical means of providing transportation on the water. An optional seating feature will allow charter type excursions as well.

The water taxi is available in several exterior designs to fit every application. You may select from a paddlewheel style, yacht style and canal boat style.

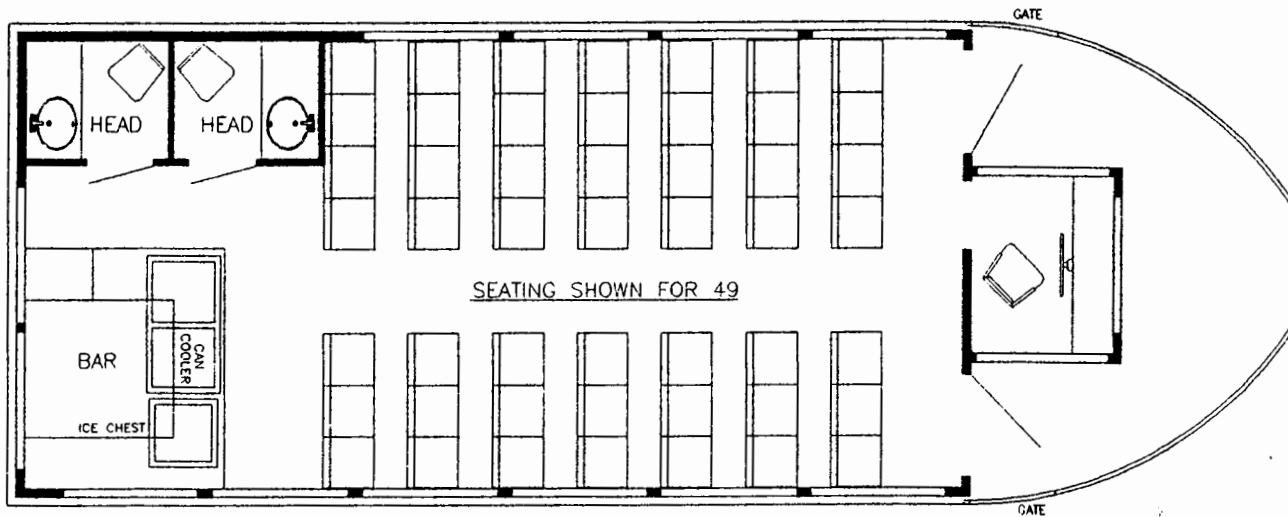
WT 490 ED - M/V Andrews





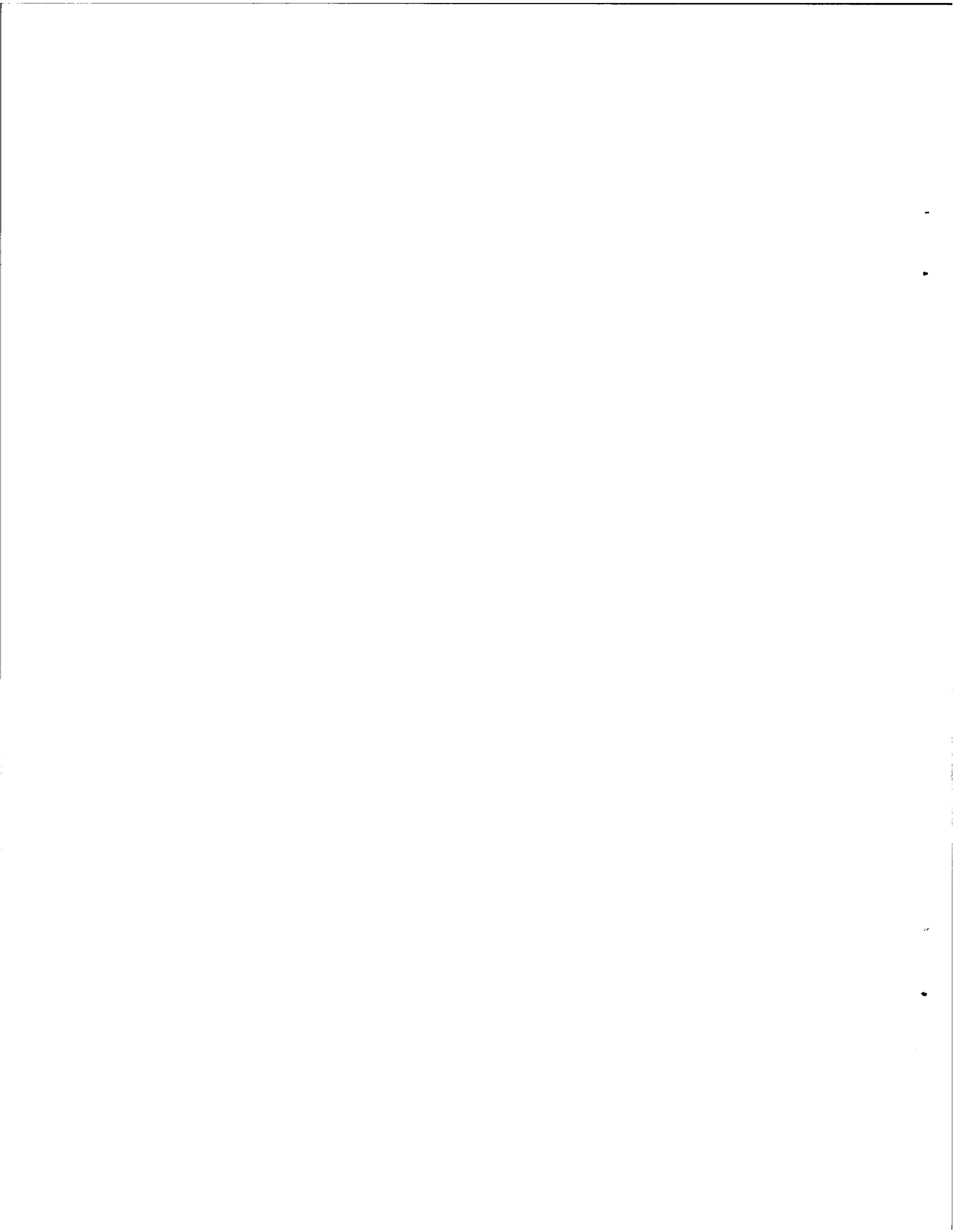


OUTBOARD PROFILE



MAIN DECK ARRANGEMENT

DWG: C. MARITGA APPR: DATE: 1-2-91	SkipperLiner Industries, Inc. 621 Park Plaza Drive La Crosse, WI 54601		
<i>The Margin of Excellence</i> <small>NOTE: THIS DRAWING IS A CONCEPTUAL SKETCH AND IS NOT INTENDED FOR USE AS AN ENGINEERING PRODUCTION. EXACT SIZE, EQUIPMENT SHOWN MAY BE DIFFERENT.</small>	TYPE: 1993 WT 490 ED	SCALE: 1/2"=1'	
	NAME OF BOAT:	BOAT #:	WT490ED
	CLIENT:	REV:	DATE OF:
	TITLE: OUTBOARD PROFILE & MAIN DECK ARRANGEMENT	LOA: 45'	BEAM: 14'





# SKIPPERLINER

*Where Excellence Takes To The Water*

MODEL WT 490 ED

## I. GENERAL SPECIFICATIONS

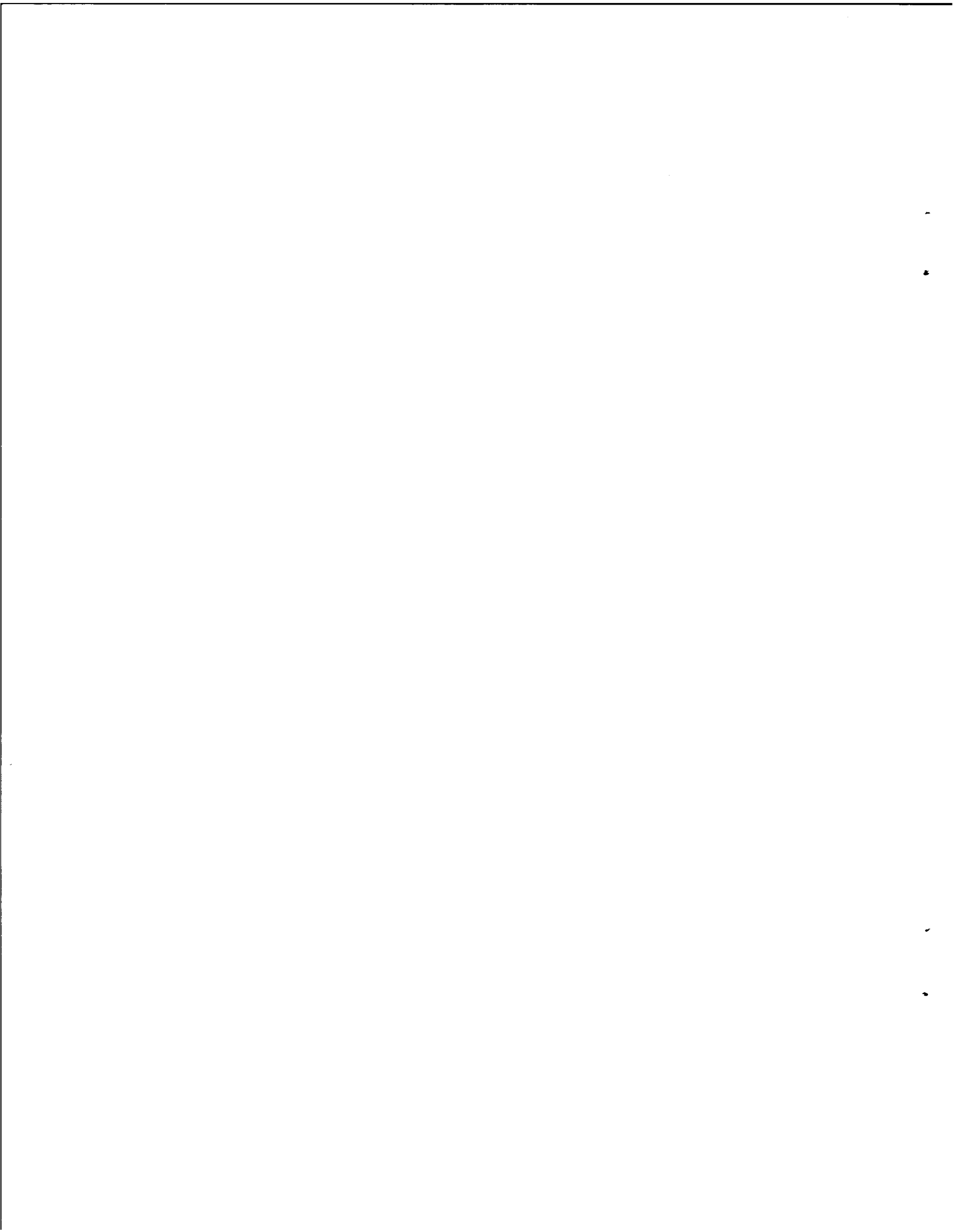
- A. LENGTH OF HULL = 35 FEET
- B. BREADTH = 14 FEET
- C. HULL DEPTH = 3 FEET, 6 INCHES
- D. POWER SYSTEM = TWIN MERCURY D183 DIESEL ENGINES  
WITH BRAVO TWO DRIVES
- E. PASSENGER CAPACITY = 49 PASSENGERS
- F. CREW CAPACITY = 5

## II. MANAGEMENT TRAINING PROGRAM

- A. SKIPPERLINER WILL PROVIDE A COMPREHENSIVE MANAGEMENT TRAINING PROGRAM FOR ALL KEY OPERATING PERSONNEL. A FAST START PROGRAM FOR PRELAUNCH PLANNING AND TICKET SALES. A PROMOTIONAL PLAN AND SAMPLE FORMATS FOR DAILY EXCURSIONS PROMOTIONS AND CHARTERS. A GENERAL OPERATIONS MANUAL FOR STAFFING AND JOB DESCRIPTIONS, PLUS A MAINTENANCE OPERATIONS MANUAL.

## III. HULL, CABIN AND SUPERSTRUCTURE

- A. THE TOTAL CABIN DESIGN IS STRUCTURED TO SET THE MOOD OF A FIRST CLASS EXPERIENCE.
- B. THREE (3) COMPARTMENTS FORMED BY TWO (2) TRANSVERSE BULKHEADS.
- C. 3/16" SEVEN GAUGE STEEL HULL WITH TWELVE GAUGE STEEL CABIN WALLS.
- D. REINFORCED INSIDE BOW BRACING BEYOND STANDARD REQUIREMENTS.
- E. ALL SEAMS TO BE CONTINUOUS WELD INSIDE AND OUTSIDE OF HULL
- F. EASY ACCESS HULL LIFTING RINGS.
- G. SIX (6) HEAVY DUTY KEVELS.
- H. THERMOPANE WINDOWS.
- I. PAINTED NON-SKID SURFACE OR CARPET ON EXTERIOR MAIN DECK.
- J. DECK DRAINS FORWARD OF FOREDECK DOOR.
- K. FAN NOSED RUB RAIL ON STARBOARD AND PORT.
- L. INSULATION IN THE ENGINE ROOM.
- M. PAINTED INTERIOR BULKHEADS AND DECKS.



IV. CAPTAIN'S COMMAND STATION

- A. CUSTOM DESIGNED CAPTAIN'S CONSOLE WITH FULL INSTRUMENTATION.
- B. FUEL GAUGES AND HOUR METERS.
- C. 90 CHANNEL VHF/FM MARINE RADIO AND ANTENNA.
- D. MOTOR DRIVEN REMOTE CONTROL SEARCHLIGHT.
- E. PUBLIC ADDRESS SYSTEM (12V)
- F. COAST GUARD APPROVED BELL.
- G. BUILT IN SEAT FOR PILOT.
- H. HYDRAULIC STEERING SYSTEM.
- I. WINDSHIELD WIPER.
- J. MORSE CONTROL SYSTEM.
- K. SONY BRAND AM/FM/CASSETTE WITH SIX INTERIOR SPEAKERS.

V. ELECTRICAL SYSTEM

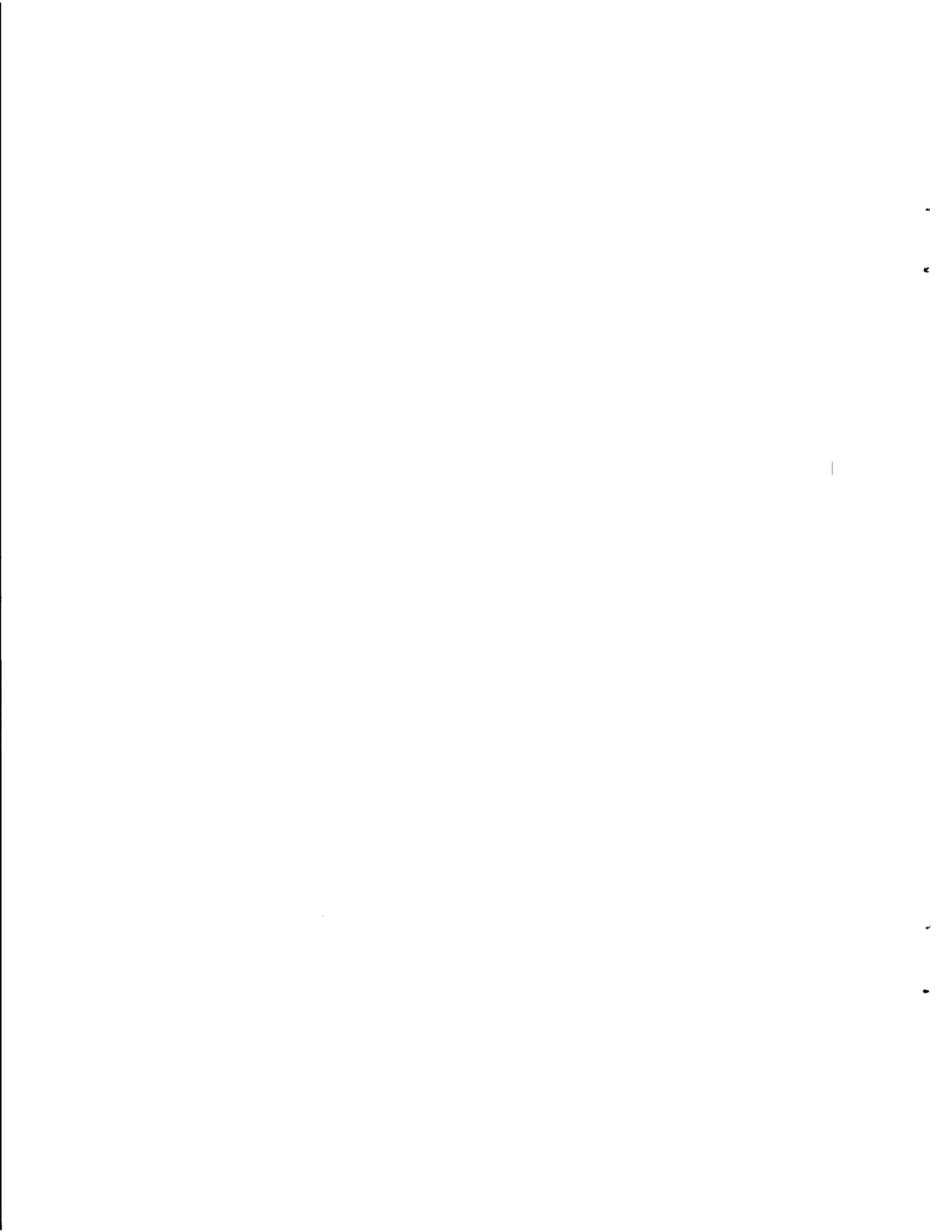
- A. TWELVE VOLT WIRING AND FUSE PANEL IN THE PILOTHOUSE.
- B. COAST GUARD APPROVED INTERNATIONAL RUNNING LIGHTS.
- C. INTERIOR 12V CABIN LIGHTING SYSTEM.
- D. FRONT DECK LIGHTING AND BELOW DECK LIGHTING (12V).
- E. THE ELECTRICAL SYSTEM IS INSTALLED BY MASTER ELECTRICIANS.
- F. THREE (3) HEAVY DUTY BATTERIES WITH BOXES.

VI. WASTE SYSTEM

- A. WASTE CAPACITY IS 115 GALLONS.
- B. THE SELECTED TOILET IS ENGINEERED TO MINIMIZE WATER CONSUMPTION.
- C. THE RESTROOM INCLUDES ONE PRIVATE MIRROR CHINA TOILET, AND A SINK.
- D. A SIDE PUMP OUT STATION IS PROVIDED.
- E. MIRROR IN HEAD.
- F. AUTOMATIC SHUT-OFF FAUCETS.

VII. PAINT AND CORROSION CONTROL

- A. THE TOTAL PAINT SYSTEM AND APPLICATION MANUFACTURING PROCESS HAS BEEN PREPARED FOR SKIPPERLINER BY SHERWIN WILLIAMS ENGINEERS AND IS PROVEN EXTENSIVELY BY SKIPPERLINER.
- B. THE HULL AND CABIN CORROSION CONTROL PREPARATION WILL INCLUDE SANDBLASTING TO WHITE POROUS METAL FOLLOWED BY:
  - 1. APPLICATION OF A RUST RESISTANT PRIMER...SHERWIN WILLIAMS.
  - 2. AN ENTIRE COATING SYSTEM BY SHERWIN WILLIAMS.
  - 3. THE CABIN WILL BE COATED WITH TWO COATS OF HIGH QUALITY SHERWIN WILLIAMS PAINT.
  - 4. ADDITIONAL PAINT SUPPLY KIT FOR FUTURE NEEDS.
  - 5. DELUXE SACRIFICIAL ZINC ANODES.



VIII. WATER SYSTEM

- A. PRESSURIZED SHURFLO WATER SYSTEM (12V) WITH AN ACCUMULATOR TANK.

IX. OPERATING SYSTEMS

- A. FUEL CAPACITY IS 200 GALLONS.
- B. EMERGENCY FUEL SHUT-OFF FOR ENGINE.
- C. PORT/STARBOARD FUEL FILL
- D. HAND BILGE PUMP.
- E. ENGINE COMPARTMENT.
  - 1. NOISE REDUCTION IN CEILING.
  - 2. ENGINE AND GENERATOR MUFFLERS.
- F. AUTOMATIC BILGE PUMP IN EACH HULL COMPARTMENT.
- G. ADDITIONAL RAW WATER INTAKE WITH A STRAINER.

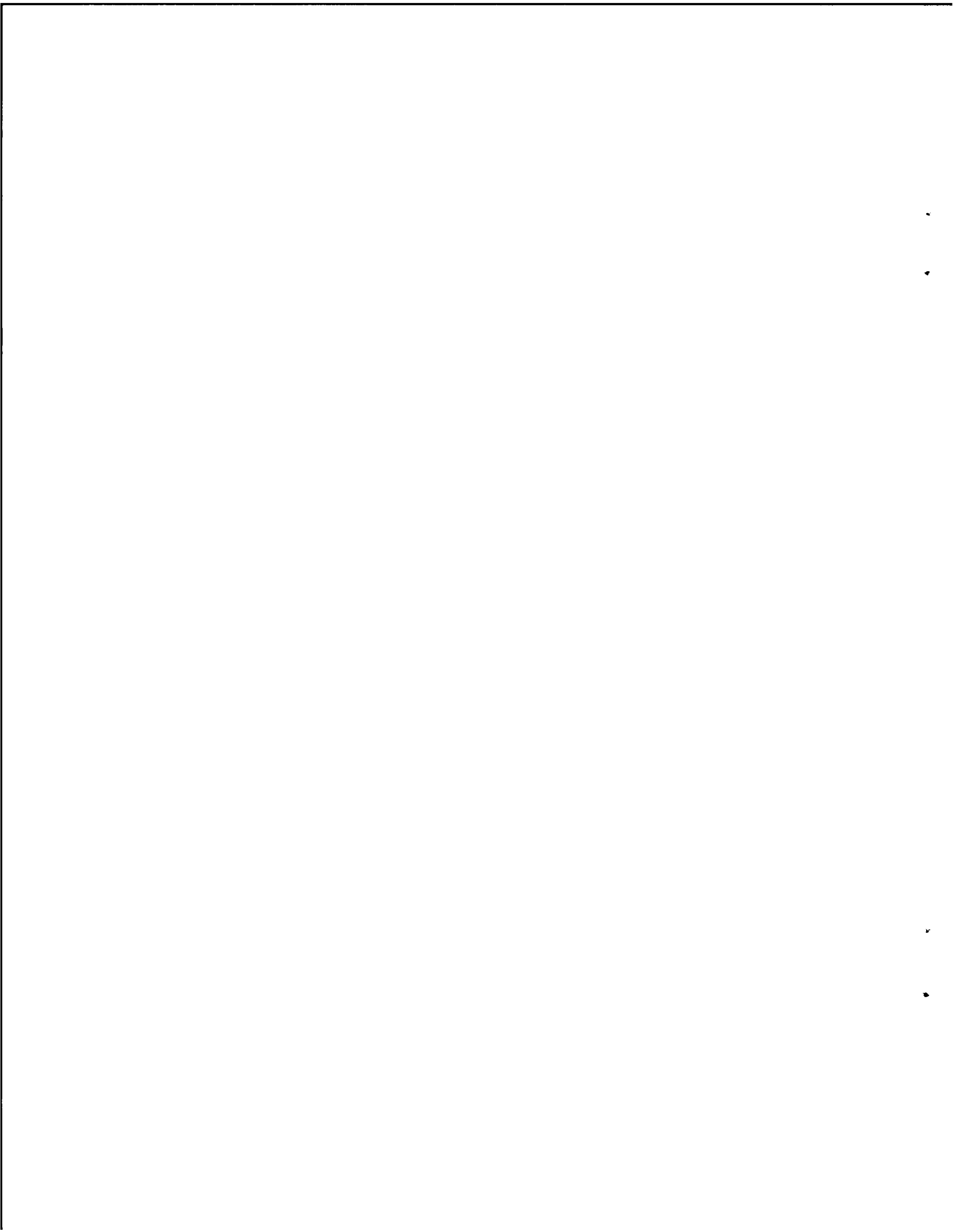
X. ACCESSORIES

- A. UNITED STATES COAST GUARD REQUIRED PERSONAL FLOTATION DEVICES (51 ADULT, 5 CHILD) ALL STENCILED WITH THE SHIP'S NAME, RING BUOYS, FIRE EXTINGUISHER AND REQUIRED LIFE SAVING EQUIPMENT FOR INLAND WATERWAY CERTIFICATION.
- B. ONE DANFORTH STYLE ANCHOR WITH 150 FEET OF LINE.
- C. AMERICAN FLAG AND FLAGPOLE AT STERN.
- D. "ONBOARD" SPARE PARTS.
- E. FLARE KIT AND RESCUE LIGHT.
- F. DOCUMENTATION OF THE VESSEL WITH THE UNITED STATES COAST GUARD.
- G. STORAGE FOR PERSONAL FLOTATION DEVICES.
- H. BENCH SEATS.

XI. PRICING

MODEL WT 490 ED F.O.B. LA CROSSE, WI

\$169,465



SHIP	PASSENGER CAPACITY	POWER	GENERATOR	HVAC	PACKAGE PRICE
WT 490 ED Water Taxi	49	Mercury D183 Turbos w/Bravo Two/Drives	Optional	Optional	169,465
WT 1000 ED Water Taxi	100	Cummins 4B 3.9M with Direct Drives	Optional	Optional	194,565
SLC 490 ED Sternwheeler with Gangplank	49	Mercury D183 Turbos w/Bravo Two/Drives	20.0 KW	61,500 BTU	349,480
SLC 1150 ED Sternwheeler with Swingstage	115	Mercury D183 Turbos w/Bravo Two/Drives	20.0 KW	79,500 BTU	399,200
SLC 1500 LX Sternwheeler w/ Gangplank	150	Cummins 4B with Direct Drives	40.0 KW	85,000 BTU	459,200
SLC 1500 ED Sidewheeler with Gangplank	150	Cummins 6BT 5.9M with Direct Drives	40.0 KW	109,500 BTU	549,000
SLC 2500 ED Sternwheeler with Gangplank	250	Caterpillar 3208 NA Direct Drives	40.0 KW	144,000 BTU	795,000
SLC 3000 ED Sternwheeler with Gangplank	300	Caterpillar 3306 NA w/Direct Drives	100.0 KW	480,000 BTU	1,636,000
SLC 4000 ED Sternwheeler with Gangplank	400	Caterpillar 3306 NA w/Direct Drives	100.0 KW	552,000 BTU	1,954,000
SLC 6000ED Sternwheeler with Gangplank	600	Caterpillar 3306NA w/Direct Drives	200.0 KW	884,000 BTU	3,475,000
EC 490 European Canal Boat	49	Mercury D183 Turbos w/Bravo Two/Drives	15.0 KW	48,000 BTU	262,000
EC 1000 European Canal Boat	100	Cummins 4BT 3.9M w/Stern Powr/Drives	40.0 KW	96,000 BTU	499,650
EC 1500 European Canal Boat	150	Cummins 4BT 3.9M with V-Drives	40.0 KW	112,500 BTU	628,100
MY 490 Motor Yacht	49	Mercury D183 Turbos w/Bravo Two/Drives	12.5 KW	48,000 BTU	285,600
MY 750 ED Motoryacht	75	Mercury D183 Turbos w/Bravo Two/Drives	16.0 KW	60,000 BTU	299,500
MY 1000 ED Motoryacht	100	Cummins 4BT w/Direct Drive	20.0 KW	85,000 BTU	499,900
MY 1500 ED Motoryacht	150	Cummins 6BT 5.9M w/Direct Drives	40.0 KW	112,500 BTU	649,200
MY 1500 IT Motoryacht	150	Caterpillar 3116TA w/Direct Drives	40.0 KW	148,500 BTU	774,160
MY 2250 ED Motoryacht (Partially Protected)	150 225	Caterpillar 3208 w/Direct Drives	40.0 KW	148,500 BTU	799,200

